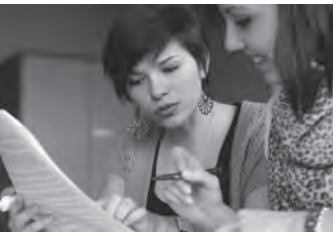
Swiss Education Report | 2010



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Foreword by those commissioning the report

Constitutional mandate

Under the terms of Article 61a, paragraphs 1 and 2, of the Swiss Federal Constitution and within the responsibilities that have been assigned to each of them, the Swiss Confederation and the cantons have a joint obligation to ensure a high degree of quality and permeability within the Swiss education system as a whole. At the same time, however, both levels of government are required to coordinate their efforts and to strengthen the cooperation that exists between them. The education monitoring process in Switzerland, jointly initiated and run by the Confederation and the cantons, constitutes an important tool enabling them to fulfil this mandate.

Education monitoring is understood as a systematic and long-term process, the purpose of which is to enable the gathering, compilation and evaluation of a comprehensive range of scientifically-verified information relating to the Swiss education system and the context within which it operates.

The Swiss Education Report 2010 constitutes a key component of this process. In the first instance, it is intended for the public authorities responsible for the management of the education system. By providing a description that takes full account of the multi-layered nature of the Swiss education system, this report sets out to create a basis, backed by relevant data, for any policy decisions that need to be taken. To this end, it draws on the knowledge of researchers, statisticians and education administrators. At the same time, the report is also intended for all the key players involved in the education system, as well as for the public at large.

Assessing the Swiss Education Report constitutes part of the education monitoring process and serves to draw up proposals for evidence-based management of the education system, providing a basis on which to prepare education policy decisions and education planning.

Management of education monitoring in Switzerland

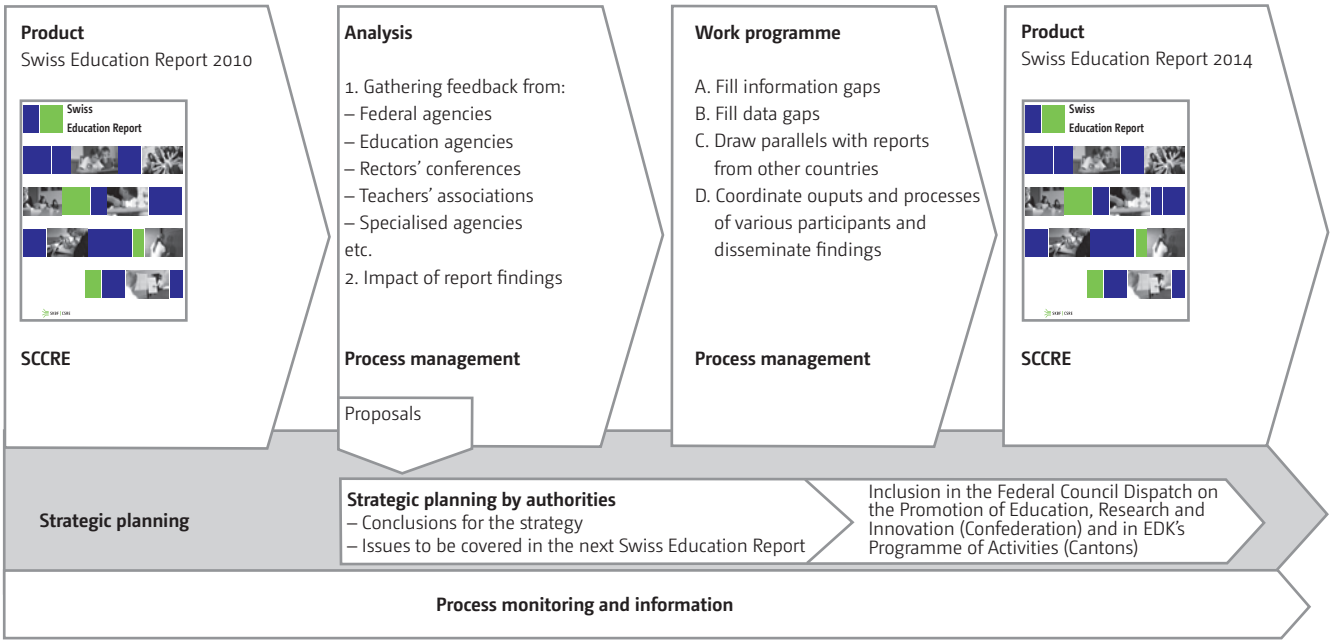
The Confederation and the cantons jointly manage the education monitoring process on an equal footing. At federal level, those responsible are the Head of the Federal Department of Economic Affairs (FDEA) and the Head of the Federal Department of Home Affairs (FDHA), while, at cantonal level, it is the Swiss Conference of Cantonal Ministers of Education (EDK) who are in charge.

At the administrative level, a Process Steering Committee has been put in place, which similarly takes in the Confederation and the cantons. The departments represented at federal level are the Federal Office for Professional Education and Technology (OPET), the State Secretariat for Education and Research (SER) and the Federal Statistical Office (FSO) while, at cantonal level, it is the General Secretariat of the Swiss Conference of Cantonal Ministers of Education (EDK) and two cantonal representatives who are involved. The Process Steering Committee commissioned the Swiss Coordination Centre for Research in Education (SKBF/SCCRE), run jointly by the Confederation and the cantons, to draw up the Swiss Education Report 2010. The SKBF's duties include not only documenting research performance in Switzerland but also conducting an independent analysis of the state of research into current issues relating to education and representing Swiss educational research in international bodies. The report that you now see before you has been compiled by SCCRE on its own responsibility.

Education monitoring as a process

The precursor to the Swiss Education Report 2010 was published by the SCCRE in 2006 in the form of a pilot report. The findings obtained during the assessment of this report were subsequently used to shape the education monitoring process (→ Figure 1). This monitoring process provides a basis on which to formulate a data-based strategy for the further development of Switzerland's education system which is duly coordinated by the Confederation and the cantons. The present Swiss Education Report 2010 is embedded in this process, in the same way as all subsequent four-yearly reports will be. The assessment of this report will generate proposals for the strategic planning of the Swiss education system.

1 **The education monitoring process in Switzerland**



Alongside this, a work programme is to be compiled which will ensure that the data and information base can be systematically improved in cases where insufficient knowledge is available or where there are still gaps in the available knowledge. The education monitoring programme currently takes in four focal points:

- Filling in identified information gaps with the aid of education research
- Enhancing the database and filling in data gaps in education statistics, in the structural and development data on the education system and also in the field of performance measurement
- Looking for synergies with reports published by other countries and international organisations
- Coordinating the outputs and processes at federal and cantonal level, and ensuring dissemination of the results.

The results of this programme will be reflected in future education reports.

Analysis of the Swiss Education Report 2010

The drafting of education reports to produce knowledge about the education system has become a firmly established international practice in recent years. National education reports are published at regular intervals; they are commissioned by governments and intended for the public at large. Education reports provide an analytical overview of the national education system and thus differ from educational statistical yearbooks. Education reports are now produced in countries that include Austria, Canada, France, Germany, Netherlands, United Kingdom and the USA. In the same way as the Swiss Education Report, all these reports are intended to provide continuously collected, data-supported information on the general conditions, milestones, results and yield of educational processes for use in educational policy-making and by the public at large.

The Swiss Education Report 2010 will be systematically analysed at various levels and from a number of different viewpoints within the education monitoring process. It is intended that education administrators, (higher) education authorities, educational researchers, universities of teacher education, teachers, professional organisations and other interested parties will be included in the assessment process. The general institutional framework must also be subjected to a process of continual benchmarking against the current situation in order to ensure that the relevant objectives have been reached in the most efficient manner possible. The findings of the analysis will be used by the competent policymaking authorities to lay down objectives, develop strategies and implement measures at the strategic planning level.

Acknowledgements

The Swiss Education Report 2010 is a tangible manifestation of the new spirit of cooperation between the Confederation and cantons that has now emerged in the education sector. We would like to take this opportunity to express our appreciation to everyone who has contributed to the successful completion of this report. Specific mention should be made of those in charge of the education monitoring process at federal and cantonal level and also all those who uphold the interests of our education system on a daily basis within the spheres of politics, administration and research.

A special word of thanks, however, must go to the SCCRE staff in Aarau for the substantial effort and dedicated work they have put into the drafting of this report.

Bern, May 2011
Swiss Education Monitoring Process

For the Process Steering Committee

Hans Ambühl
General Secretary,
Swiss Conference of
Cantonal Ministers of Education

Ursula Renold
Director
Federal Office for
Professional Education and Technology

Introduction

Following the pilot publication entitled *Swiss Education Report 2006,* the present report now constitutes the first Swiss Education Report proper. The pilot publication was evaluated by two international groups of assessors from Germany and Canada, and, in 2007, various hearings were conducted with representatives of all the different levels within the Swiss education system. The information gathered in this way, together with the extensive feedback obtained on the pilot report, such as in reactions to lectures and articles by SKBF staff members, formed the basis for the conceptual considerations adopted for the present report. This can be summed up in the following seven points:

The general structure of the pilot report – based on education level and education type – has been retained. This has the advantage that information on an individual education type is all located together, rather than being spread throughout the report, thus enabling the reader to obtain a concise overview of the individual education types.

A structure based on education levels and education types also has a number of drawbacks, however, in addition to the advantages it offers. Two measures have thus been adopted in this report in an attempt to eliminate these drawbacks as far as possible. First of all, information that relates not just to one specific type of education but to several types ought to be presented in a single location in comparative form. This applies particularly in cases where several types of education are offered at the same educational level, such as the conventional universities, the universities of applied sciences and the universities of teacher education. For this reason, an introductory chapter has been included for each of the first three levels of the education system (compulsory education, upper-secondary level and tertiary level) setting out comparative information for the entire education level that follows. Secondly, structuring the report according to education types makes it impossible to present impacts on education that are not normally generated by education at a specific level but rather by the cumulative effects of education over an entire educational career. To counter this drawback – which was the subject of justified criticism – a new chapter has been included in the education report dealing with the cumulative effects of education. This then covers primarily the impact of education on other factors, such as income or health, referred to as the «outcomes» of education. The analyses in the chapter in question are based chiefly on research work, since an analysis of statistical information alone would not generally suffice, given the difficulty encountered in establishing the individual causes and effects that are involved. Research results of this type, however, based on a suitable methodological approach, are few and far between, which is why recourse has been had to the full spectrum of international education research. Research results that are not based on Switzerland are only presented if it can be assumed that the results are applicable in an identical or similar manner to Switzerland as well.

In this report, too, it proved impossible to comply with the wish to have educational paths through all the different education levels presented on the basis of statistical data, due to the lack of suitable data. The bulk of the data and research work is thus still based on cross-sectional studies, which provide only limited insight into the longer-term effects that skills gained at one level of education have on subsequent academic and/or professional

achievements. Transitions from one education level to the next, however, play a particularly important role for all three assessment criteria selected for the education report, namely effectiveness, efficiency and, above all, equity. These transitions are thus described on the basis of the available data and research analyses for the education type just completed by the student, since this generally offers a significant basis on which to assess the performance of the education level in question.

As already mentioned, the Swiss education system is here again assessed on the basis of the three criteria of effectiveness, efficiency and equity. The majority of those who assessed the pilot publication felt that this was a successful approach, since the three perspectives allow statistical data, education administration data and education research findings to be presented in such a way as to provide meaningful information for strategic planning purposes. The information relating to effectiveness, efficiency and equity is supplemented by information on the context and the institutions associated with the different education types. Information on the context is important in order to obtain a fair picture of the education performance of a specific type or level of education, while information on the institutions is necessary for highlighting and understanding the differences between the individual cantons, given that responsibility for the Swiss education system is shared between the Confederation and the cantons. The consistent internal structure of the individual chapters on the education levels and types makes it easier to draw comparisons between them. Despite this, it has still not proved possible (as in the pilot report of 2006) to achieve a consistently-structured description of all the education types. The chapters relating to upper-secondary specialised schools and tertiary-level B professional education and training (PET) are structured differently, because there is not enough information available on these two education types to permit meaningful assessments for all three criteria. This is due both to the scarcity of statistical data and research data and to the considerable heterogeneity of these two education types.

There are three potential dimensions to a comparison that can be used to monitor educational performance: firstly, a comparison over time, secondly, a comparison between institutions and cantons within Switzerland and, thirdly, a comparison of Switzerland with other countries. Not all situations within the education system are presented so as to permit all three dimensions of comparison. This is because the education report is intended primarily to generate insights that can be used for strategic planning purposes, and this is more important than giving an exhaustive description of the Swiss education system. Hence, after analysing the available information from all three comparison dimensions, only the information that can actually be used for strategic planning purposes is presented in this report. Due to the lack of space, the authors do not explain why certain comparisons, though perfectly feasible, have neither been presented nor carried out. For the comparison of cantons and educational institutions (e.g. universities), the order was selected in such a way as to produce insights for strategic planning. Only rarely was an attempt made to establish a ranking list of institutions or cantons, since a specific order would in many cases not permit a qualitative assessment of educational performance. Generally speaking, whenever lists were needed for purely descriptive purposes, cantons were presented in the order

in which they appear in the Swiss Federal Constitution. For comparisons of Switzerland with other countries, the four main neighbouring countries (Austria, France, Germany and Italy) were always included in the comparison, where such information was available, together with a selection of other countries considered to be of special interest to the matter on hand. Once again, since the aim is primarily to serve strategic planning interests rather than to provide a full description of the Swiss education system, the countries selected are not the same for all the different comparisons.

Even though the Swiss Education Report 2010 is around one hundred pages longer than the pilot publication, all the information and diagrams still represent a strict and careful selection from amongst the full range of information that could have been included. The decisive factors for inclusion were not only the relevance of the information for answering education-policy questions but also the need to establish a clear distinction between our report and other information vehicles. Wherever possible, the authors tried to avoid placing too much emphasis on purely descriptive statistical data. This was done for two main reasons: such data quickly become outdated, and the latest data can already be very easily obtained from Switzerland's Federal Statistical Office (FSO) or from international organisations such as the OECD. The authors also deliberately refrained from providing an extensive overview of the current state of research for each education issue, since the education research community already produces and publishes such overviews. The Swiss Education Report 2010 nevertheless sets out to provide comprehensive and up-to-date bibliographical references to existing research work and summaries. In this way, interested readers will be readily able to find the relevant literature.

The pilot publication contained conclusions with regard to education reporting, but did not contain a definitive assessment of the Swiss education system itself. This present report likewise deliberately refrains from making a further assessment of the reporting and monitoring process or a summary assessment of the quality of the Swiss education system. This is and remains the remit of education policy-makers and education administrators. The task of this report is to present available information, data and research findings in a way that enables those responsible for strategic planning to carry out their work. All in all, the Swiss Education Report 2010 contains information and data on several hundred education issues. As such, it already provides a powerful summary of the available knowledge considered essential for identifying and devising responses to key education policy issues. Despite this, and in a bid to optimise its readability, the report contains a management summary for readers wishing to gain a rapid overview. It must, however, be pointed out that reading the management summary is no substitute for reading the entire report.

Those who have read the pilot publication will undoubtedly notice that a great deal of time and energy has gone into the layout. We trust that this has considerably enhanced the appeal and the readability of the report and will make studying the report both an informative and enjoyable experience!

Management summary

Compulsory education

In coming years, education planners will be faced with the major challenge of striking a balance between the constitutional mandate to harmonise the compulsory education sector and the need to adapt compulsory education to local conditions. All education policy measures are aimed at providing a coherent education system that guarantees permeability, accessibility between the different levels of education, and quality, for both compulsory and subsequent education. In a state organised along federal lines, these multiple considerations place stringent requirements on the coordinating bodies and institutions that deal not only with structural aspects but also with initiatives affecting the content of education (curriculum development, language instruction, quality improvement, etc.).

The most significant education policy challenges in the harmonisation of structures within the Swiss education system relate to the question of entry into pre-school and primary school, namely, the age at which compulsory education should start and how the school entry phase should be configured. Although the HarmoS Agreement provides for the duration of pre-school to be standardised and for pre-school to be made compulsory, it does not stipulate how the school entry stage is to be configured. A number of variants are possible, ranging from the conventional kindergarten to one of two types of integrated model for the first stage. This latter option, which has been tested in several German-speaking cantons in Switzerland, is intended to ensure that the transition from pre-school to primary school is more closely adapted to the individual development of each child.

The starting age for compulsory education has not only been the subject of political debate, it has also been the focus of intensive research for a number of years. Two particular issues are particularly prominent in this regard. On the one hand, it has been argued on the basis of the latest findings in developmental psychology and research into the human brain that it would be desirable from the point of view of skills acquisition if the early years of childhood, which seem to be particularly fertile when it comes to acquiring skills, were not permitted to pass by unused. While considerable documentary evidence exists with regard to the acquisition of skills in the early years, it would appear, in the further course of their education, that children who started school at a younger age frequently do not gain any benefit whatsoever, or that any such benefit is only small. It is not, however, clear just how far the structures, curricula and expectations of subsequent school levels are responsible for this. It has also been demonstrated that children whose home environment is less conducive to learning will be at less of a disadvantage if they are able to enrol in pre-school education at an earlier age, thereby lengthening the duration of their pre-school attendance. This would make it possible to reduce the heterogeneity in learning performance that is already measurable when children start school in Switzerland. The better starting conditions upon entering school would hopefully help prevent problems at a later stage in the child's study path. This option is currently unavailable to many children in Switzerland due to the limited availability of affordable places for children below the age of four. Moreover, pre-schools in some German-speaking cantons of Switzerland generally last for only one year, and there is a lack of comprehensive school-based day-care facilities. Both these factors probably place less fortunate children at a disadvantage. Finally,

international research into the economics of education has shown that the years «gained» as a result of starting school at an earlier age translate into a monetary gain for both society and the individuals themselves (extending their working lives), which would be difficult to match by any other educational measures.

At primary school level, the average number of teaching hours delivered in the various cantons still differs substantially. The impact of these differences on academic achievement in the individual cantons has not, however, been documented as yet. A comparison of the number of compulsory teaching hours for specific subjects in the curricula for children aged between 9 and 11 or 12 also shows that, in Switzerland, less time is currently spent on tuition in the school's language of instruction than in neighbouring countries. A greater amount of time is, however, devoted to teaching foreign languages. It is not possible to determine whether this additional attention to foreign languages results in a greater mastery of foreign languages, since no applicable international comparative studies on the teaching of foreign languages have been carried out to date.

The decline in the number of students at primary school due to demographic factors is now affecting lower-secondary education as well. With just a few exceptions (Geneva, Zug, Zurich), all the cantons, and especially those located in rural areas, are being forced to discontinue classes or even shut down schools. Many cantons are attempting to prevent this or combine it with structural or educational reforms. Declining student numbers represent a special challenge for the multiplicity of structures in lower-secondary education in the different cantons, since school systems based on ability grouping are the ones that suffer first when student numbers become too low. Because these differentiated types of systems are well accepted among the populace, it should not be the case that pupils are allocated to different lower secondary level paths on the basis of maintaining school numbers rather than on the basis of entry requirements for the various ability-based programmes. The move towards more cooperative and integrated models could provide a solution in this respect.

At present, with the OECD's regular competence measurements, the only point in a school career for which reliable comparative academic achievement data are available is for students who are just leaving compulsory education (PISA). Switzerland was unable to improve its international ranking for the reading literacy of 15-year-olds between 2000 and 2006. More telling than Switzerland's static position in the middle range of the countries tested is the fact that Switzerland was unable to reduce the proportion of students who scored at the lowest skill levels. Approximately 15% of students coming out of lower-secondary education barely achieve the lowest skill level measured in the PISA survey. The effects of such an unsatisfactory compulsory school education manifest themselves in the fact that, by the age of 21, around one-third of these students have still not obtained a post-compulsory qualification, while this is true of less than 5% of the students who scored highest on the PISA test.

Switzerland spends a great deal of money on compulsory education compared with other countries. At the same time, however, there are major differences in the amount invested in education by the individual cantons. Although the data are not fully comparable, since the cantons do not use the same costing model, it is clear that almost 50% of this expenditure differential can be explained by the financial strength of the cantons. In other

words, the «wealthier» cantons have to spend more on their education inputs because the relative cost level is higher in all other areas too. This is also seen in an international comparison, where the differences in gross domestic product also account for roughly half the variation in expenditure on education. Whether or not the portion of expenditure that cannot be ascribed to different cost levels brings added-value to the education sector cannot (yet) be determined on the basis of current research.

Upper-secondary level education

At present, just under 90% of students who have completed compulsory education in Switzerland go on to successfully obtain an upper-secondary level qualification. This latter qualification, however, is a key requirement for a student's future educational and job career, and the rate of just under 90% is still quite a long way off the target of 95% which has been set for 2015 in education-policy terms. A more detailed examination of upper-secondary graduation numbers shows that, although the gender gap to the detriment of females has steadily narrowed over the past few years, female students still achieve fewer upper-secondary level qualifications, even though they are not at an academic disadvantage compared with males at the end of their lower-secondary education. This target graduation rate of 95% is, however, achieved by male and female students who were born in Switzerland and have thus completed their entire education in Switzerland, irrespective of their nationality. This would suggest that more intensive efforts need to be made to ensure that students not born in Switzerland who, in some cases, have only completed a couple of years of their education in Switzerland, acquire an upper-secondary level qualification. This task poses a challenge for both education and integration policy.

Seventy percent of all students coming out of compulsory education enrol in a VET (vocational education and training) school and 30% in a school providing a general education, with these shares remaining relatively constant. Of this first proportion, a more or less constant 90% enrol in a dual-track VET programme.

Since the apprenticeship crisis in the mid-1990s, the situation in the VET sector has improved considerably, both in terms of the number of apprenticeships available and the way in which VET programmes are able to adapt to social and economic needs. This is highlighted by three different factors: first of all, more than three-quarters of all students who enrol in a dual-track VET programme consistently state that they are following the apprenticeship of their choice. In other words, the dual-track VET programmes provide a clear majority of VET students with the training they wish to receive. This particular fact is all the more remarkable, since a frequent assumption made outside of Switzerland is that only general education and entirely school-based models allow individual students to complete the upper-secondary level programme of their choice. A second factor indicating the healthy state of the VET sector is the introduction of a new two-year VET programme leading to the Federal VET Certificate. An increasing number of training companies are taking part in these two-year programmes. Unlike the previous two-year apprenticeship model, which did not lead to any formal quali-

fications, students completing a certified two-year VET programme obtain a qualification that enables them to continue their training at a higher level within the VET sector. Even though it is still too early to draw a definitive conclusion regarding these certified two-year VET programmes, the initial experience seems to indicate that dropout rates among students enrolled in certified two-year VET programmes are lower than expected. The third indication of the healthy state of the VET sector is the steadily increasing number of VET students who obtain the Federal Vocational Baccalaureate (FVB). The popularity of the Federal Vocational Baccalaureate shows that the VET sector is able to offer opportunities for further development to even the most gifted learners and that VET programmes are in considerable demand. What is unclear, however, is why the number of male Federal Vocational Baccalaureate holders enrolling in a Swiss university of applied sciences has declined sharply. The economic growth of past years may partly explain this, since Federal Vocational Baccalaureate holders would have a greater incentive to enter the job market rather than take their education and training to a higher level. A partial answer to this question will doubtless emerge over the next few years, as we observe the subsequent paths taken by Federal Vocational Baccalaureate holders.

The proportion of students obtaining the Baccalaureate has stabilised at around 20% since the start of the current decade. There has been a fierce debate in Swiss education and social policy circles regarding the ideal proportion of Baccalaureate holders. However, rather than questioning the average proportion of Baccalaureate holders within Switzerland as a whole, greater attention should actually be paid to the significant variation in the average proportion of Baccalaureate holders in the individual cantons. In 2008, the proportion of Baccalaureate holders reported by individual cantons ranged from 14.0% to 29.3%. The academic achievement of students just leaving compulsory education (PISA) does not provide any explanation for these differences if, indeed, these same performance segments go to the upper-secondary-level selective schools in all the cantons. In addition, according to the results of the EVAMAR II assessment of the academic achievement of Baccalaureate holders, it can no longer be maintained that the Baccalaureate automatically equates to the same level of academic achievement everywhere, regardless of initial aptitude at enrolment. Not entirely surprisingly, the EVAMAR II measurements showed differences in performance at the time of taking the Baccalaureate which correlated negatively with the proportion of Baccalaureate holders in an individual canton. The fact that admission to Baccalaureate schools is based less on actual aptitudes than on education policy considerations is all the more disturbing when it is considered that Switzerland is among the few industrialised countries which grants Baccalaureate holders virtually unrestricted admission to universities and the different university programmes.

Alongside Baccalaureate schools, there are around 60 upper-secondary specialised schools that provide students with general education options, and, over the past five years, nearly 5% of all students coming out of compulsory education have enrolled in these schools. As of 2010, 14 out of 22 cantons have offered students the possibility of obtaining a Specialised Baccalaureate in their specialisation. Only one of the 22 cantons offers Specialised Baccalaureates in all six of the available specialisations.

Tertiary level

The tertiary level of the Swiss education system offers a broad spectrum of alternative fields of study that encompass a wide range of subject areas and different types of institutions. Those who have completed VET courses at upper secondary level may enrol directly in a university of applied sciences or tertiary-level B professional education and training. Federal Vocational Baccalaureate holders who take the university aptitude test, may also enrol in a conventional university. The option for VET graduates to continue their education at both tertiary-levels A and B explains why Switzerland ranks in the middle in international comparisons of the total number of tertiary-level qualifications, despite its relatively low proportion of «academics». International comparisons ought, in fact, to be based on the total number of tertiary-level qualifications, since each country defines its tertiary-level education and institutions differently. Some countries, for instance, include two-year tertiary-level A qualifications in their calculations.

Around 90% of all holders of the Baccalaureate continue their studies at a tertiary-level A institution. Around three-quarters of these students enrol in a conventional university or one of the Swiss Federal Institutes of Technology. When considering the relatively low percentage of Baccalaureate holders and the limited access to conventional universities, we should also consider the quality of the education provided by the Switzerland's conventional universities. Switzerland has the advantage of being able to channel its strongest academic achievers towards conventional universities. In many other countries, universities are required to educate students from a broad spectrum of aptitudes. This channelling of students is another reason why Switzerland's big conventional universities are considered among the world's most elite universities while, even in the USA, which has the largest number of elite universities, the majority of university students are enrolled at universities that never appear in international ranking lists. In Switzerland, over 70% of students at conventional universities study at one of the top 200 universities in the Shanghai Ranking, while in the USA or Germany, just under 20% of university students do so.

It is widely known that the annual costs per student differ substantially, depending upon the subject area (between CHF 9,690 and CHF 39,970). While part of the difference in annual costs per student can be attributed to the different types of equipment and infrastructure required for specific fields of study, it is worth noting that a large portion of the cost difference is also due to the dissimilar staff-student ratios. The fields of study can be divided into two groups: those involving intensive supervision and high costs (such as pharmacology and the exact sciences) and those with less intensive supervision and low costs (such as law or economics). Although it is not possible to determine the efficiency or lack of efficiency of a given field of study purely on the basis of the staff-student ratio, it is difficult to justify such differences. They indicate either sub-critical staff-student ratios in some fields of study, or significant potential for savings in others.

Universities of applied sciences (UAS) not only offer VET graduates the possibility of pursuing tertiary-level A studies, they also reflect a persistent social distinction in the choices of upper-secondary level education and training in Switzerland. While the majority of young people whose parents hold academic qualifications also attend Baccalaureate schools and later enrol

in a conventional-university degree programme, young people whose parents do not hold academic qualifications are more likely to enrol in a degree programme at a university of applied sciences. In other words, universities of applied sciences contribute to upward social mobility to a much greater extent than is observed in countries with predominantly conventional universities. Since graduates from universities of applied sciences do not suffer any disadvantages in terms of job market prospects compared with conventional-university graduates, the option of universities of applied sciences studies contributes to a high degree of intergenerational mobility from an economic perspective as well.

That having been said, students enrolling at the universities of applied sciences are an extremely heterogeneous group. Although an apprenticeship and the Federal Vocational Baccalaureate count as the standard entrance qualifications, just under 40% of entrants to universities of applied sciences in 2008 actually held these specific qualifications. In traditional fields of study that were previously offered by Switzerland's former engineering colleges and former business administration colleges, the Federal Vocational Baccalaureate is the main prerequisite for admission. By contrast, up to 90% of the students at the universities of applied sciences enrolled in new fields of study, such as music, health care or social care, are admitted on the basis of other qualifications – frequently the Baccalaureate.

The number of Baccalaureate holders who choose to enrol in a university of applied sciences degree programme is approximately the same as the number of Baccalaureate holders who choose to enrol in a degree programme at a university of teacher education (UTE) – the third and newest type of university in Switzerland. Baccalaureate holders, however, only account for around two-thirds of the students at the universities of teacher education, with the remaining students admitted on the basis of a different qualification – increasingly the Specialised Baccalaureate issued by specialised schools. Despite having such a broad student recruitment base and decentralised campuses in geographic terms, it currently has to be assumed that all the universities of teacher education taken together are not training sufficient numbers of new teachers to meet the long-term needs. Although the increased numbers of teachers taking retirement (for demographic reasons) will partially be offset by the decline in student numbers, the number of teacher-education students required to fill future teaching vacancies also needs to be high enough to compensate for those who drop out of their course, do not enter teaching at the end of their course, or drop out of teaching. A greater number of students overall at the universities of teacher education, would perhaps also alleviate the current problem of having to operate these universities with very low student numbers. In expanding the universities of teacher education – assuming that this is possible at all – it would also be necessary to resolve the present situation in which the quality and effectiveness of teacher training is not monitored on the basis of standardised output criteria. No truly research-based statements can be made at present regarding the attainment of objectives in teacher education or regarding the correlation between teacher education and its effectiveness in terms of teaching.

Very little research and statistics are available for tertiary-level B professional education and training (PET). This is in stark contrast with the high number of tertiary-level B qualifications issued each year. One reason for this may be the extremely varied nature of PET programmes and qualifications. Another reason may be the fact that only colleges of professional

education and training base their degree programmes on a standardised set of pre-determined performance requirements, while the attendance of preparatory courses for Switzerland's two national professional examinations, the Federal PET Diploma Examination and the Advanced Federal PET Diploma Examination is recommended but not mandatory. Since the Swiss Education Report 2006, two studies have significantly improved the availability of information on the funding and costs of tertiary-level B PET programmes. These studies show that students at professional education and training colleges are not required to pay considerably higher tuition fees than those at the universities. Tuition costs at professional education and training colleges are not significantly higher than the semester tuition fees charged by the most expensive conventional universities and universities of applied sciences. As far as preparation for the Federal PET Diploma Examination and the Advanced Federal PET Diploma Examination is concerned, the costs that the students have to pay depend to a decisive extent on whether they decide to attend a preparatory course or not. The preparatory courses, which generally last from one to three semesters, cost students CHF 8,000 to CHF 10,000 on average. There are also opportunity costs, such as loss of income (which are only partially reimbursed by the employer). These costs also have to be borne by university students, however, and do not therefore put PET students at any disadvantage.

Continuing education and training

Private costs are also incurred by individuals pursuing continuing education and training activities which do not lead to formal qualifications. As with professional education and training programmes, employers fund around 50% of their employees' continuing education and training costs. The rest of the CHF 5.3 billion spent on continuing education and training each year is funded by the continuing education and training students themselves. Employers tend to bear a much lower burden of continuing education and training costs for female employees. This gender disparity is only explained to a small extent by factors such as a difference in the percentage of full-time employment, hierarchical position, and educational background, and thus points to the inequality of men and women in this field. Apart from the gender aspect, an additional education policy concern is the fact that participation rates in continuing education and training programmes and courses vary according to a person's level of formal education and training. Rather than compensating for differences in the level of formal education and training among specific groups within the population, the continuing education and training sector is actually exacerbating the problem. Unlike in other countries, the major differences in continuing education and training participation rates in Switzerland are not so much a matter of who holds tertiary-level qualifications and who holds upper-secondary level ones but are due virtually entirely to the very low participation rate of individuals who lack post-compulsory education qualifications.

By and large, Switzerland has a dynamic and flexible continuing education and training sector, with high participation rates on average. As with the professional education and training sector, however, it is the wide range

of different continuing education and training qualifications, providers and contents that probably accounts for the lack of empirically-based, generalisable statements on the effectiveness and efficiency of continuing education measures. It could also be argued that a lack of such information is comprehensible and justifiable, given that this particular sector of the Swiss education system is still largely organised and funded privately. It would, however, be a bigger problem if the state were to respond to the education policy recommendations that it play a more significant regulatory and funding role in the continuing education and training sector.

Definitions

Effectiveness

Effectiveness is a measure of the efficacy of an action or measure in terms of achieving a specific objective. In contrast to efficiency, effectiveness only measures the extent to which the objective is achieved and does not take into account the outlay required to do this.

Types of objectives

In the education sector, as in other sectors, a system, institution or an individual measure is deemed to be effective if it achieves the set objectives. The problem in measuring effectiveness in the education sector stems from the complexity of the objectives being pursued, which (unlike the majority of corporate objectives) are difficult to precisely define and operationalise. Broadly speaking, the potential objectives of educational measures or institutions can be subdivided into three categories:

Educational outputs are the direct results of the education process: on the one hand, qualifications and percentages of students achieving them and, on the other hand, students' competencies and skills at the end of their education and training. **Outcomes** refer to the medium- to long-term effects of education on other factors of social and economic relevance.

(1) When it comes to quantitative outputs, the absolute number of students at a given level of education and the qualifications obtained can be defined as objectives. The participation of the population in education is also a potential quantitative objective, in the form of qualification rates or percentages of the population attaining a specific level of education. At outcome level, quantitative impacts on the job market can constitute objectives of education, such as low unemployment or a high participation level of the population in gainful employment.

(2) Alongside these quantitative output parameters, the qualitative performance and impacts of the educational institutions also constitute an objective, given that imparting competencies is their prime task. In addition to specialist competencies (academic achievements) this can also include overarching, social and other competencies. At outcome level, qualitative impacts such as satisfaction, quality of life and similar factors can count as objectives, i.e. the potential finalities of the educational process.

(3) Alongside outputs and outcomes, which are seen at the end of the educational process or reflect its impact, it is also possible to define equity within the process as an objective. (→ *Equity, page 31*).

Establishing objectives

Objectives for educational institutions or for the education system as a whole can be established at institutional level or at a local, regional, national or international level (see *USR, 2005*). With the publication of the new Intercantonal Agreement on Harmonisation of Compulsory Education, known as the HarmoS Agreement, the cantons have, for the first time, set out joint, overarching objectives for compulsory education. These incorporate underlying principles relating to the acquisition of knowledge and skills, the development of a cultural identity and the encouragement of responsible behaviour towards others and the environment. The Swiss Conference of

Cantonal Ministers of Education (EDK) is also developing national educational standards within the context of the HarmoS Agreement, which will be monitored by means of regular testing at the end of Years 2, 6 and 9. At tertiary level, education is currently assessed primarily on the basis of objectives defined in a performance mandate, which the institutions are required to achieve within the framework of an overall budget. Finally, the objectives for vocational and professional education and training in Switzerland are specified in the Federal Vocational and Professional Education and Training Act . The problem at all levels of the Swiss education system is that the objectives are neither explicitly stated nor set out in a hierarchical structure. Since, in a complex system like education, a large number of objectives are generally pursued at one and the same time, a relative (political) weighting of the individual objectives is not only essential for assessing the effectiveness of the education system but would also provide the players with a key source of information for the necessary action and for strategic planning. In the absence of this information, it is impossible to determine whether it is better to maximise the attainment of one objective, jeopardising the attainment of others, or whether it is better to accept a lower-level attainment of objectives (and hence a lower effectiveness) for certain sub-objectives if this permits a higher degree of attainment for other sub-objectives.

Before an agreed package of objectives can be specified for an education system as a whole or for individual levels within the system, it is necessary to identify the various connections (interactions and interdependencies) that exist between the individual objectives. The multiple objectives of the education provided may well be independent, complementary, or conflicting. Objectives are deemed to be complementary if their achievement enables the achievement of other objectives. If it is assumed, for instance, that socially well-integrated, contented and interested students also display a high level of academic achievement in the conventional school subjects and, in turn, that a high level of academic achievement promotes contented and well-integrated students, then it is possible to get by with measuring just one of these factors. Since the two effects and objectives are complementary, if one of the sub-objectives is attained to a high level, then the other sub-objective will automatically have been attained too.

In addition to complementary objectives, it is also possible for objectives to conflict with one another, leading to a dilemma between objectives. Hence, the objective of maximising the number of students with university qualifications may compete with the objective of providing a high quality of education. Aiming to achieve a high number of graduates without the appropriate measurement of quality runs the risk of the effectiveness in achieving one objective undermining the effectiveness in achieving the qualitative aspect of education. In such a case, the overall outcome would not be a positive one.

Defining and measuring competencies

One important function of education is to enable students to acquire subject-specific and social skills. If we wish to measure the extent to which these objectives have been achieved, however, it is important to consider two questions: What skills are important? And how should these be operationalised? The Swiss-led OECD project known as DeSeCo – «Definition and Selection of Competencies» – made a key contribution to answering

the first question by attempting to identify the core skills required for personal, social and economic well-being *(Rychen & Hersh Salganik, 2003)*. By defining three categories of core skills (interacting within heterogeneous groups, acting independently and interactive use of aids and tools), the DeSeCo project set out a framework concept for the measurement of competencies, thus making a substantial contribution to achieving a better definition of the objectives in the education system and establishing the hierarchy of these objectives. The DeSeCo project also resulted in a greater awareness of the fact that skills should not be regarded as objectives in themselves but should always be described in terms of their impact on specific outcomes. This is because, at system level, it is generally the desired outcomes that are specified (e.g. social integration, lower unemployment) and not the competences that are necessary for this.

Since (core) skills were very broadly defined in the DeSeCo project, it became more difficult to determine how skills should be measured in practice. As a result, empirical skill assessments (e.g. the «Programme for International Student Assessment», PISA) permit the highly elaborate measurement of competencies, but only for a very limited number of competencies. Only if the measured competencies are deemed to be complementary to the non-measured ones is it possible to justify not measuring relevant competencies. In this regard, PISA and DeSeCo illustrate the fact that, when measuring skills, there is still a conflict of objectives between achieving as comprehensive a definition of competencies as possible and finding a simple means of operationalising these competencies. This applies not only to the compulsory education sector but also, and perhaps to an even greater extent, to post-compulsory education and training. One reason for the lack of skills measurement in upper-secondary and tertiary-level education to date is doubtless the breadth of education and training on offer and the types of skills imparted. Nevertheless, international endeavours are underway in both vocational and professional education and training (see e.g. *Winther & Achtenhagen, 2009*) and tertiary level A (as part of the OECD's AHELO[1] project, for example) to introduce skills testing in post-compulsory education as well.

Effectiveness sections in this report

For the reasons outlined above, it was not possible to refer to an existing, definitive set of objectives for the effectiveness sections in this report. At each individual level, therefore, we have attempted to define a number of key objectives on the basis of official, educational administration documents, on the one hand, and the research literature, on the other. In order to avoid falling into the trap of ultimately commenting only on objectives for which measurement data are available, reasons are set out in the text as to why important objectives cannot (currently) be measured and hence assessed. We also suggest the steps required for these objectives to be measured and assessed in future. This marks an attempt to compensate, in the text sections, for the inevitable focus on measurable parameters seen in the graphs and statistical charts in this report.

1 AHELO = International Assessment of Higher Education Learning Outcomes; see www.oecd.org/edu/ahelo

Efficiency

Efficiency refers to the degree of effectiveness and the suitability of measures in relation to specified objectives. More concretely, efficiency is an indicator of the ratio of input to output in a system.

In general, efficiency is not an official objective of the education system. It is thus not mentioned in most education policy or administrative documents. So why has efficiency been included as a criterion in the Swiss Education Report? When allocating resources or introducing incentives to the education system, the prime question asked by education policymakers and researchers is whether the resources or incentives in question will make any contribution to the attainment of the specified objectives (→ *Effectiveness, page 24*). Just because resources are used effectively does not in any way mean that they are being used efficiently as well. Efficiency is of prime importance in the education sector for two reasons. First of all, even in education, it is essential for objectives to be achieved with the lowest possible input. Since resources are limited, they must always be used sparingly. This is not because the aim is to achieve profit in the education sector, as in a business, but because the resources channelled into education (time and money) could also be used to satisfy other social or individual needs. If students can acquire the mathematical or language skills specified in the curriculum with fewer lessons, then sufficient time will be available for tuition in music or sports as well. At the same time, it also makes sense to maximise the output per resource unit, since the return will then have a positive effect on other outcomes for society and the individual. If the education system is able to produce more competent students for a given amount of resources, then the resultant gain in competence will have a positive impact on other areas, such as health-related behaviour, social behaviour and many other areas besides (→ *Chapter Cumulative effects, page 269*).

Definition of concepts

A distinction is drawn between different concepts of efficiency in the literature, all of which are significant for the education sector (for the concepts see, for example, *Grin, 2001*; *Wössmann and Schütz, 2006,* also provide an overview of the literature).

The correlation between inputs and the specific outputs of the education system (e.g. competencies) is referred to as internal efficiency, while the influence that education has on other social or individual objectives (e.g. economic growth) is referred to as external efficiency.

If the real inputs are used to calculate efficiency, then this is referred to as technical efficiency, and if the inputs are expressed in monetary terms (i.e. have a price put on them), then this is referred to as economic efficiency. The performance of the education system is not achieved with just a single input, and the combination of inputs (such as teaching staff and teaching materials) is not rigidly defined but can be varied. This means that allocation efficiency – or achieving the most efficient combination of inputs – is also extremely important. All these forms of efficiency are of interest in the Swiss Education Report, since they all play a key role in assessing the performance of the Swiss education system.

Problems in determining internal efficiency

A major problem encountered when measuring efficiency within the education system is the fact that no unequivocal theoretical concept has been devised to determine how resources (inputs) in the education process affect outputs (the imparting of skills) (for more details, see *Vignoles, Levacic, Walker et al., 2000*). As no such conceptual framework exists, it is not possible to calculate a theoretical maximum efficiency. This means that the efficiency of the education system can only be assessed over time or by comparing different education units (systems or institutions). These comparisons will yield information about the relative efficiency of a specific education system or education provider (e.g. a school). With this information, statements can be made on the direction in which efficiency is moving over time and on how far an education system differs from the most efficient education system at present (even if an even more efficient system would be possible in theoretical terms). With an approach of this type, it immediately becomes clear that the quality of efficiency assessment hinges on whether both inputs and outputs can be surveyed in a sufficiently standardised form to ensure full comparability, both over time and between the individual providers, without any limitations. The difficulty here becomes apparent when it is considered that, in order to compare the efficiency of resource deployment over time, it also has to be possible to compare the outputs over time. If the student's skills are defined as the output, then, in practical terms, the skills determined on the basis of a variety of test questions must remain comparable over prolonged periods of time.

Finally, it must also be borne in mind that any comparison of input-output relationships will only be meaningful or useful for the purpose of policy-making if the general conditions in which education is provided are comparable (the same holds true, of course, for the assessment of the criteria of effectiveness and equity). Specifically, this means that school A has only achieved a higher student performance than school B for the same resources if it has also managed to do this under the same framework conditions as school B. In other words, for school A to be genuinely more efficient than school B, it would need to be capable of achieving an even greater level of efficiency in its use of resources than school B in a setting comparable to school B and with the latter's students and parents. To permit a comparison of this type, the output of schools A and B will generally need to be rendered «equivalent» through elaborate statistical processes.

External efficiency and causality

Statistically speaking, a great many objectives that serve the interests of individuals in education and also society as a whole (e.g. health, happiness or a democratically functioning state) correlate positively with the level of education of individuals or society as a whole. If efficiency considerations are to be transposed to objectives that are to be attained through education (outcomes), it is necessary to appreciate that the mere existence of a positive correlation between level of education and outcome does not necessarily mean that the outcome was actually caused by education. One potential reason for a limited or totally lacking causal relationship can be the time span between education and outcome. If individuals who receive a good education actu-

ally live longer, so much time will have passed between the provision of that education and the age reached by the individuals concerned that proving the existence of a direct correlation between education and life expectancy will be extremely difficult. Problems of interpretation can also arise when factors which have a positive influence upon the outcome (in this case, a high life expectancy) also enable these same individuals to remain in education and training for longer. In such cases, there may very well be a positive correlation between the increase in life expectancy and the level of education achieved, but there will be no causal relationship, or only a minor one. Such considerations are important for efficiency, since, if the causal relationship between education and outcome (and the same also applies for education system outputs) is overestimated, the efficiency of resource use will also be overestimated.

Finally, education can also affect desirable outcomes indirectly (such as through earned income). If people on higher incomes can afford to pay for better healthcare and therefore remain in better health, there will be a positive correlation between their health and their level of education, since more highly educated individuals earn more on average. In this case, the level of education would have an indirect effect on life expectancy. As far as external efficiency is concerned, the question this prompts would therefore be: is education definitely the most efficient means of improving health or could perhaps the same effect be achieved more efficiently by means of social transfers to the needy?

The significance of technical efficiency

The distinction between technical and economic efficiency is important for education policy when it comes to deciding where to intervene in the education system in order to increase efficiency. To analyse the technical efficiency of mathematics teaching, for example, it would be necessary to establish whether the students' level of mathematical skills would be attained with the same number of mathematics lessons in all schools. To calculate economic efficiency, the real input quantity (in this case, the number of lessons) would be multiplied by the price (the salaries of teaching staff) before performing the analysis described above. In this example, it is clear that the ranking of the most efficient schools or education systems is not always the same for technical and economic efficiency.

If schools that achieve the highest skills in mathematics with a given number of mathematics lessons (and therefore achieve the highest technical efficiency) also pay the highest salaries to their teaching staff, then these schools will not necessarily achieve the highest economic efficiency. Details of technical efficiency are thus also important, because they enable us to determine which teaching staff, schools or education systems use the most efficient teaching methods and teaching programmes. Economic efficiency must also be taken into account when deciding whether the real inputs provide good value for money.

Distinguishing between economic and technical efficiency is also important for assessing efficiency trends over time. Empirical research has shown that a major portion of the declining efficiency of a system can be attributed to a rise in input costs with a stagnating output (see, for example, *Hanushek & Rivkin, 1997*). This means that, even if the number of teaching hours, teach-

ing materials or infrastructure used – and hence the technical efficiency – remained constant, the economic efficiency would actually decline, due to the increase in the real cost of those inputs. The distinction between economic and technical efficiency is especially important in the case of Switzerland. Viewing economic efficiency in isolation could lead to misinterpretations, since input costs not only vary over time, but also vary considerably from one canton to another.

Inputs must be combined

All things considered, efficiency is not solely a matter of comparing the quantity and cost of inputs to output. It is also a matter of finding the right combination of inputs. Achieving an efficient mix of inputs (such as teaching staff and teaching materials), i.e. the allocation efficiency, is just as important as the individual inputs and their impact in isolation. To illustrate this point, let us consider a hypothetical situation where an education authority needs to decide whether to allocate additional resources to reducing class size (i.e. hiring more teachers), or to purchasing technical aids, such as new learning software. The available funds may well be allocated more efficiently if they are used to purchase learning software, even though the cost of each of the inputs (teaching staff and learning software) is exactly the same. It is thus the combination of inputs that plays a decisive role and not the quantity. It is not an easy matter to compare the efficiency of schools or systems that not only operate on the basis of different quantities of inputs but also use different combinations of inputs. In technical terms, however, analyses of this type can still be carried out, employing the appropriate methods (see, for example, *Sheldon, 1995*). An additional factor making the analysis of allocation efficiency more difficult is the potential interaction of individual inputs, which is often not well enough known. It thus goes without saying that the effectiveness of deploying learning software will depend to a decisive extent on how well the teachers in a school have been trained in the use of this aid. If there are no teachers, or only a few teachers with the appropriate training, then even large-scale deployment of learning software in the classroom will be of little use. In other cases, the interaction between individual inputs may well be less obvious.

Efficiency is also a matter of perspective

Efficiency considerations can be applied at the macro, meso and micro levels within the education system. On the macro level, the full range of inputs can be related to the overall output of the education system. At the meso level, this correlation can be established for individual entities (e.g. schools) while at micro level, it is the efficiency of individual teaching staff or students that is considered. Efficiency considerations from the viewpoint of the individual stakeholders within the education system are also possible.

Society itself has to decide whether the resources used within the education system, measured against the objectives that have been specified from a particular perspective, could not be put to better use elsewhere. Schools and teaching staff have a duty to use the resources at their disposal in the most efficient manner and the most efficient combination possible in order

to ensure student success in the classroom. And the students themselves also consider the efficiency factor within education. Although students have no control over the main factors of education production (quality of teaching staff, learning resources etc.), they do have to consider, on a daily basis, how they can use their time and other resources most efficiently. Most efficiency analyses either fail to include the behaviour of students at all, or only include it in a rudimentary fashion – even though the students are co-producers in the education «production process».

Averages and marginal analyses

A final problem associated with efficiency assessment is that empirical analyses of relationships between input and output generally compare averages. The difference between two averages does not always show how output would change if the input were to be increased by one unit with all other parameters remaining equal (marginal analysis). If a school that delivers twice the number of mathematics lessons than the average at all the other schools also enables its students to acquire mathematical skills that are more than twice as advanced as those achieved by the other schools, thus not only deploying the additional number of lessons in an effective manner, but also with a greater efficiency, then we cannot automatically conclude that a subsequent doubling of the number of lessons delivered by this efficient school would once again give rise to a similar doubling of the skill levels attained. When making inputs, it has to be assumed that these will generate a decreasing additional return (marginal return). For this reason, increasing the inputs often gives rise to a drop in average efficiency, even if student output increases as a result. No firm pronouncements can be made on this issue, despite the fact that it is of crucial importance in terms of education policy, since relatively few controlled experiments have been conducted on the efficiency of an educational measure with the specific aim of acquiring knowledge for strategic planning purposes.

Due to these difficulties in determining and calculating efficiency, it is only possible to make more general pronouncements as to the efficiency of the system or of individual education providers in the Education Report. In situations where it is completely impossible to make any sort of efficiency assessment, we shall nevertheless endeavour to give an approximation of the degree of efficiency of the Swiss education system by taking data and analyses relating to the material and monetary inputs to the individual education levels and education types.

Equity

For the purpose of this Education Report, the concept of equity refers to equality of opportunity. The internationally used term of equity is given precedence over equality of opportunity not least because this latter term has gained many different connotations – not all of which are positive – after years of drawn-out ideological debate in the education and social policy fields. In order to limit the rather broad scope of interpretation associated with the

term equity, the definitions included in the OECD study entitled «Equity in Education» *(Coradi Vellacott & Wolter, 2005b)* will be used for the purpose of this report: «Educational equity refers to an educational and learning environment in which individuals can consider options and make choices throughout their lives based on their abilities and talents, not on the basis of stereotypes, biased expectations or discrimination. The achievement of educational equity enables females and males of all races and ethnic backgrounds to develop skills needed to be productive, empowered citizens. It opens economic and social opportunities regardless of gender, race, ethnicity or social status.»

It is possible to distinguish between two different dimensions of *equity (OECD, 2007b)*. The first of these encompasses the aspect of fairness: personal and social attributes should not stand in the way of academic achievement. The second dimension relates to inclusion: minimum educational standards must be guaranteed for everyone.

Equity represents an important policy objective for the education system, which is why there is near unanimity that the abilities and talents of students must determine their academic achievement. When it comes to how these different abilities and talents are to be nurtured, however, a range of different viewpoints prevail:

In accordance with the principle of meritocracy (*equality of access* or *equality of opportunity*), equity is achieved if formal equality is guaranteed and access to further education is granted on the basis of academic achievement. The *equality of treatment* approach, by contrast, specifies that everyone is entitled to receive the same education and be given the same opportunities for learning, irrespective of their individual achievement, and hence the selection of students on the basis of academic achievement is to be avoided. The concept of *equality of achievement*, in turn, requires special attention to be given to individuals with socially-conditioned weaknesses to ensure that they can gain the essential basic skills. Finally, the approach of *equality of social actualisation* requires highly individualised teaching, enabling everyone to develop his or her own specific abilities (see *Demeuse, Crahay & Monseur, 2001*).

Measuring equity

The most important indicator for measuring equity is probably the distribution of social groups across the various levels and types of education and training.[2] Unequal distributions between social groups do not necessarily mean that the equity principle has been infringed upon, since these can fundamentally be based on entirely rational decisions, therefore being free of stereotypes, biased expectations and discrimination. Depending on the interpretation of the equity principle, inequalities within individual types of education do not violate the equity principle if they can be explained on the basis of inequality of achievement. By contrast, inequality of opportunity between students with identical academic achievement is a strong indicator

2 Factors that may indeed constitute violations of the equity principle include differences in job market opportunities based on the level and type of education achieved (e.g. risk of unemployment, earning potential, etc.) as well as individual achievement within the relevant levels and types of education.

that the equity principle is being violated – irrespective of what is regarded as fair in each case.

Effectiveness, efficiency and equity

If equity is laid down as an objective of the education system, then the achievement of this objective is a measure of system effectiveness. An effective system will thus be characterised by a high degree of equity among other things. On this point, the question arises as to whether the objective of increasing average academic achievement and the objective of reducing the impact of social factors on academic achievement are conflicting objectives or whether they can be reconciled with one another. International research publications show that it is certainly possible to achieve a high degree of equity in conjunction with a high degree of academic achievement (see the summary in *Wössmann, 2008b*).

The issue of efficiency can also be related to the objective of equity. In order to assess whether the objective of equity is being approached in an efficient manner, however, it would be necessary to conduct differentiated analyses in order to measure the correlation between input and output (in this case, equity). Apart from the fact that this is a complex task, an additional problem is the lack of a clear definition of the concept of fairness that underlies equity and hence of the measures that must therefore be given priority. Even after the equity objective has been achieved, internal efficiency cannot be readily determined (→ *Efficiency, page 27*).

Equity should not, however, be understood solely as an objective for the education system. Equity can also be a prerequisite for the efficient achievement of other objectives, such as social cohesion or economic growth (→ *Chapter Cumulative effects, page 269*).

Educational disparities refer to differences between the education received by different social groups and are the result of both primary and secondary effects (see *Boudon, 1974*). The primary effect refers to the socialisation conditions in the parental home which can lead to a difference in academic performance in identical institutional (school) conditions. The secondary effects relate to socialisation conditions that influence the choice of an educational pathway for a given level of performance.

Equity as a multi-dimensional issue

For the purpose of this report, equity will be analysed from the standpoint of three distinct social criteria: social origin, migration background and gender.[3] While distinguishing between genders within social groups is fairly straightforward, differentiation is more difficult for the other two categories on account of the lack of separation efficiency. If we set out to apply social origin as a criterion, we first need to «artificially» subdivide this category into two or more disadvantaged or privileged groups. This is usually done on the basis of professional status, the highest educational qualification obtained and/or the income of the parents or of the father or mother. Delimitation problems also arise when attempting to determine the existence of a migration background, and once again there is no clear consensus as to what constitutes a migration background: in general, nationality (Swiss citizen or non-Swiss citizen) or place of birth (Switzerland or abroad) is applied as a criterion. In some cases, these criteria are applied to the students, while in others they are applied to the parents.

3 For more detailed information, see *Coradi Vellacott & Wolter (2005b)*.

A large number of people also suffer from multiple disadvantages (e.g. low socio-economic status and a migration background). This creates problems when researching the causes, since it is frequently impossible to separate the various influences from one another for analytical purposes. It is also difficult to estimate what additional problems will be encountered by those concerned as a result of being multiply disadvantaged.

Focal points of equity

Problems relating to a lack of equity can occur at various points of an educational path (→ Figure 2). While transitions from one level of education to another have proved to be especially critical, there can also be violations of equity within an individual education level.

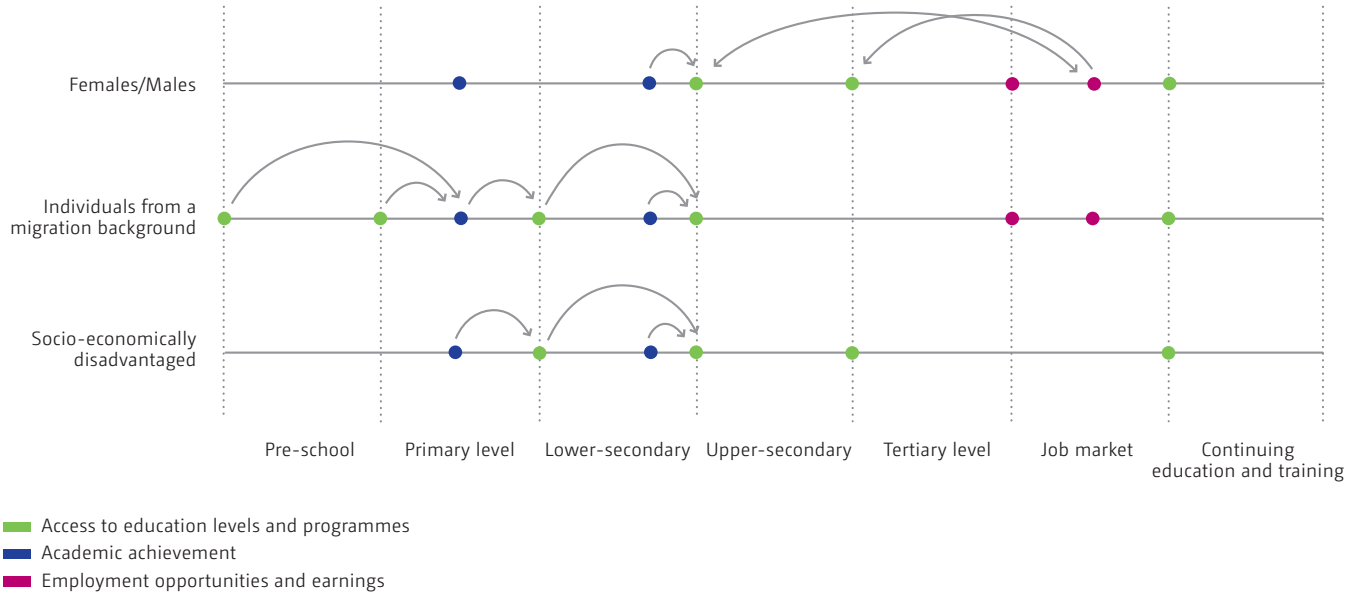
In analysing equity within the education system, it would seem logical to observe this from a lifetime perspective. In some cases, the place where an equity problem is diagnosed is not actually the place where the problem was originally caused. This is because a violation of the equity principle generally affects subsequent education levels and because anticipated future discrimination can influence early educational decisions.

Overall, the absence of longitudinal or cohort data within the Swiss education system severely limits the validity of any statements on the cause and effect relationships governing equity within a particular level of education and on outcomes in any subsequent level of education. The creation of student identifiers in educational statistics will, however, bring about an improvement in this regard over the long term.

The reasons for the equity principle being violated are to be found at different levels. First of all, institutional factors can give rise to equity problems. This category includes insufficient pre-school and school-based childcare facilities, early selection within the compulsory school sector and the use of non performance-related criteria to determine grades or assign students to particular levels of education.

The diagram below depicts the points at which a lack of **equity** is most apparent. All previous research literature has identified these as particularly critical points along the educational path. The absence of symbols does not necessarily mean that there are no equity problems; it could merely point to a lack of research.

2 **Points at which a lack of equity is most apparent and the cause and effect relationships**
Information: Coradi Vellacott & Wolter 2005a



Secondly, economic factors can also have an influence on inequitable educational decisions (the cost of attending a Baccalaureate school/university, private tutoring etc.).

Thirdly, social and cultural factors may shape an individual's educational path. These could include stereotypical expectations which subsequently affect the choice of profession, grades or the self-confidence of the individual in question.

Fourthly and finally, motivational factors must also be considered. Differences in the educational aspirations of parents may give rise to unequal educational decisions.

In view of the current state of data and research, it is not possible to address all the aspects of equity mentioned here in every chapter. If certain correlations are not drawn or if the situation of specific social groups is not considered, then this does not necessarily mean that there are no problems associated with them.


HELLO

Context

Demographics

Education systems are strongly influenced by demographic trends. Cyclical fluctuations in the number of students can easily be handled by adjusting class sizes but where there are longer-term demographic changes in a specific direction, class size adjustment is only possible to a limited extent and also does not constitute a sensible option.

Demographic trend

The Federal Statistical Office (FSO) has calculated three basic scenarios for **population development** in Switzerland. The medium growth scenario, which serves as the reference scenario, continues the developments observed over the past few years and includes current trends. The high and low-growth scenarios are based on a combination of assumptions favouring additional population growth or doing little to encourage it, respectively.

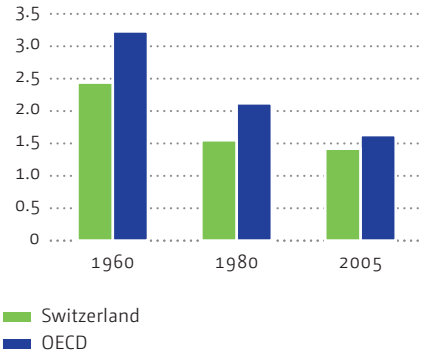
The Swiss population has more than doubled from 3.3 million (1900) to 7.7 million (2008) since the start of the 20th century. Population development is influenced by three factors: life expectancy, fertility rate (excess of births over deaths) and migration (net migration).

Over the past few decades, human life expectancy has risen steadily. Based on the medium-growth demographic scenario established by the Swiss Federal Statistical Office (FSO), it is likely that human life expectancy will rise still further. This is illustrated by the fact that, in 1987, the predicted average life expectancy in Switzerland was 74 years for men and 81 years for women. By 2007, these figures had risen to 79 years for men and 84 for women. By 2050, it is predicted that the average life expectancy for the Swiss population will be 85 years for men and 90 years for women.

3 **Birth rates in Switzerland and the OECD, 1960–2005**

Average number of children per woman aged 15 to 49

Data: OECD

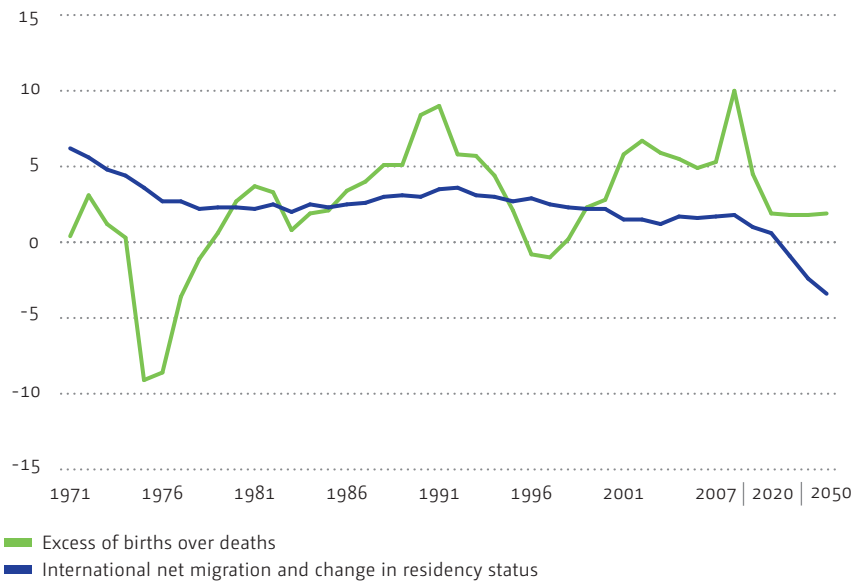


The average number of children born to each woman fell dramatically between 1960 and 2005 (→ Figure 3). Whereas, in 1960, women gave birth to an average of 2.4 Figure 3the baby-boom generation), this figure had fallen to 1.4 children by 2005. This means that over a 50-year time span, women in Switzerland have given birth to one child fewer than before on average. The birth rate of 1.4 children per woman is slightly lower than the OECD average of 1.6 children per woman. It must be assumed that the fertility rate will stabilise at this level *(FSO, 2006a)*. This shift can be explained by changes in the economic, political and social context in Switzerland. The change in the role of women in society and a less prevalent belief that having more children will secure one's existence, especially in old age, are most likely the main reasons for this. Up until the mid-1980s, the excess of births over deaths was the main driver of population growth (→ Figure 4), reinforced by the Federal Administration's migration pol Figure 19 mainly promoted immigration from high-birth-rate countries. It would not have been possible, however, for the persistent decline in the birth rate in Switzerland to be offset by increases in life expectancy. This is the reason why, for over twenty years now, net migration has been the main driver of population growth in Switzerland (→ *Migration, page 40*). In 2006, for example, net migration accounted for around three quarters of population growth. According to the medium-growth scenario established by the Federal Statistical Office for long-term population growth, however, this driving force will actually lose its impetus, and hence the population of Switzerland will undergo much slower growth in the long term.

4 **Population trend**

Forecasts for 2010–2050, according to the medium growth scenario established by the Swiss Federal Statistical Office per 1000 inhabitants

Data: FSO



The **excess of births** over deaths represents the difference between the number of births and the number of deaths. The **net migration** is the difference between immigration and emigration. Individuals who have undergone a **change in residency status** are those who originally entered Switzerland on the basis of a short-term residence permit valid for less than one year and who were subsequently granted a residence permit valid for several years, thereby changing their residency status.

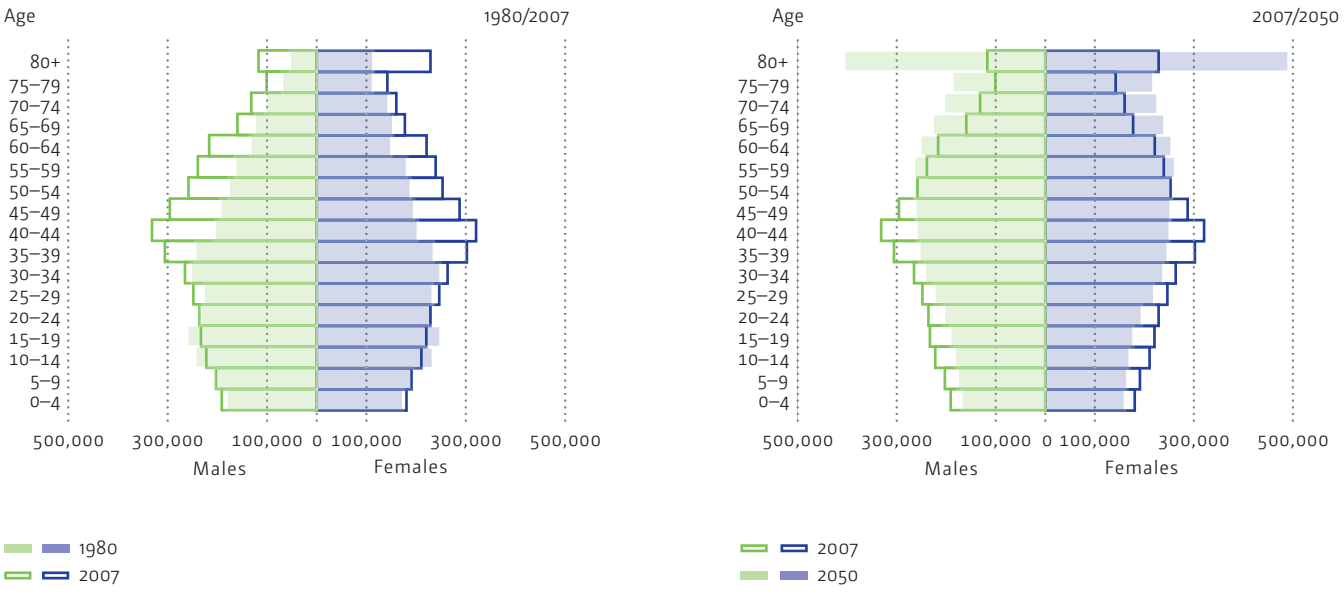
Age structure

Increased life expectancy, a falling birth rate and new migration flows are all giving rise to changes in the age structure of the population as well. As recently as 50 years ago, the age structure was pyramid-shaped, with a relatively high number of young people at the bottom and a small number of elderly people at the top. Nowadays, however, the age structure of the Swiss population is onion-shaped (→ Figure 5).

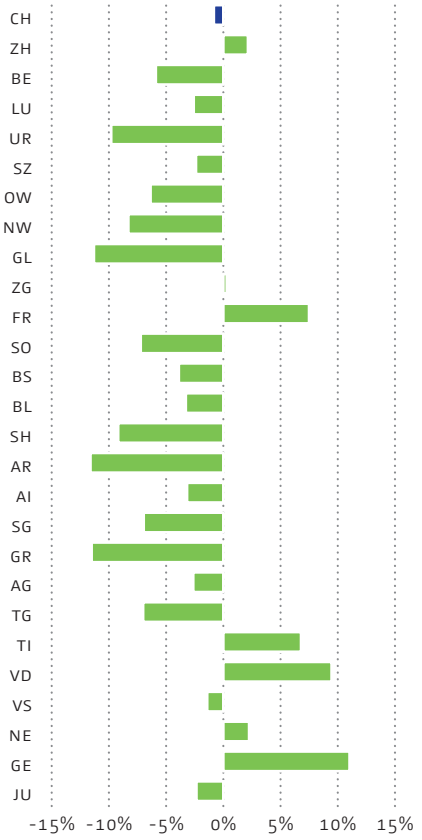
5 **Age distribution 1980, 2007 and 2050**

Outlook based on the medium scenario established by the FSO

Data: FSO



6 **Changes in the share of 5 to 20-year-olds in individual Swiss cantons from 2000 to 2007**
Data: FSO



The baby-boom generation (those born in the early 1960s) is now in its mid-forties and is the largest age category. Children and young people only account for approximately 20% of the population. No fewer than one-sixth of all Swiss inhabitants belong to the 65+ age group (→ Figure 5). In future, too, the number of older people is set to inc Figure 5 more dramatically. According to the demographic scenarios that have been drawn up, senior citizens will account for the largest share of the population in 2050.

Since demand for education differs on a regional basis, and hence educational provision varies in line with demand, major regional differences in population development and age structure have a much greater impact on the education system than would be expected on the basis of the average change for Switzerland as a whole. The long-term trends (more older people and fewer young people) are not moving in the same direction in all the Swiss cantons, and there are even substantial regional differences within a large number of the cantons. Certain cantons have even managed to considerably reverse the trend over the past few years, with an increase or only a slight decline in the number of children and young people (→ Figure 6).

The declining and ageing population thus constitutes a c Figure 6or the Swiss education system, and population developments both within Switzerland as a whole and in individual regions will need to be taken into account in planning this system. (Specific predictions with regard to individual school levels and school types are covered in the relevant chapters.)

Migration

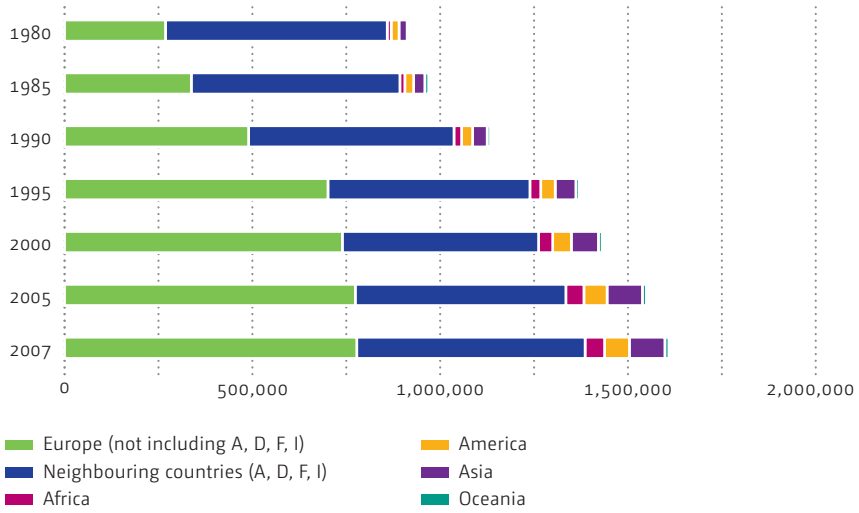
While migration movements are of major importance for the education system in that they affect the number of people requiring an education, the education system, in turn, is also of importance to the migrants, since it constitutes one of the key pathways to social integration. Not only do migrants have a quantitative impact on the education system, the linguistic and cultural composition of the migrant flows also represents an important factor for the education system.

In 2008, there were 1.6 million foreign nationals (21% of the total population) resident in Switzerland. Around one-fifth of these were born in Switzerland. Approximately 85% of the foreign nationals living in Switzerland come from other European countries (→ Figure 7). Over the past few years, there has been a substantial in Figure 7net migration from Germany in particular, plus a continuing constant outflow of Italian and Spanish nationals returning to their home countries.

Swiss migration policy has also gone through a number of different stages, and these are manifested in the composition of Switzerland's foreign resident population. In the decades that followed World War II, most migrants entering Switzerland had a below-average level of education and training qualifications. This is reflected in the figures from the 1990s when around 60% of working-age migrants entering Switzerland each year lacked VET qualifications and only 10% had tertiary level qualifications. A fundamental change has come about in this composition over the past few years. With the intro-

7 **Foreign residents in Switzerland by nationality, 1980–2007**

Data: FSO

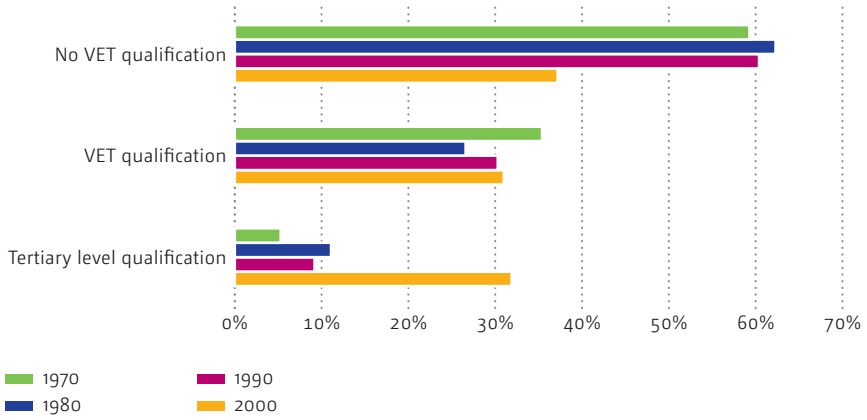


duction of freedom of movement for nationals from EU and EFTA member states, an increase has been seen in the proportion of migrants from EU member states (70% from EU-17/EFTA member states, including 48% from Switzerland's neighbouring countries) which has been accompanied by an increase in the average level of qualifications held by migrants to Switzerland. In 2000, more than 30% of the new immigrants were holders of tertiary level qualifications (→ Figure 8). Between 2005 and 2007, some 60% of new migrants had tertiary level qualifications – a rate that is twice as high as that of Swiss citizens *(Sheldon, 2007)*. This significant difference should nevertheless be put into perspective, since these are comparisons between qualifications obtained in different national education systems. A healthcare worker qualification in Switzerland, for example, is obtained by completing an apprenticeship while, in other countries, this same qualification is achieved by taking a university course.

8 **Education level of immigrants, 1970–2000**

Educational level of resident foreign nationals aged 15 to 64 who arrived in Switzerland in the previous five years, but are not undergoing education or training

Data: *Sheldon, 2007*

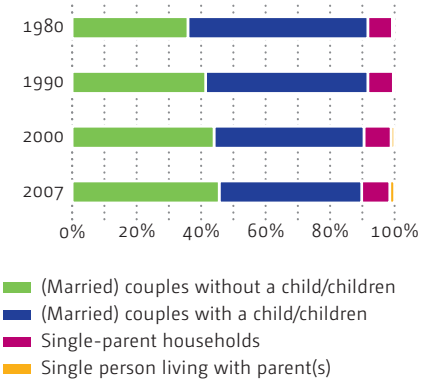


When interpreting the figures relating to «new» migrants, it is thus important to take this factor into account. An additional fact of interest is that the increasing numbers of migrants with tertiary level qualifications are only replacing those migrants with low qualification levels. The number of migrant holders of vocational qualifications has remained almost constant.

If we compare the level of education of Switzerland's foreign resident population (age 25 and older) by country of origin, we find considerable differences: over half of German, Austrian and French nationals residing in Switzerland are holders of a tertiary level A qualification while only 7% of nationals from the former Yugoslavia and Portugal hold such a qualification.

9 **Composition of family households in Switzerland, 1980–2007**

Data: FSO



Family and living structures

The past few decades have witnessed changes in family and living structures, and these trends are likely to continue. One of the factors that also changes in line with these structures is the prerequisites for participation in the education process. Depending on the type of family they come from, students will be endowed with a different level of financial, cultural and social resources that may well have a decisive influence on the level of success they achieve in education.

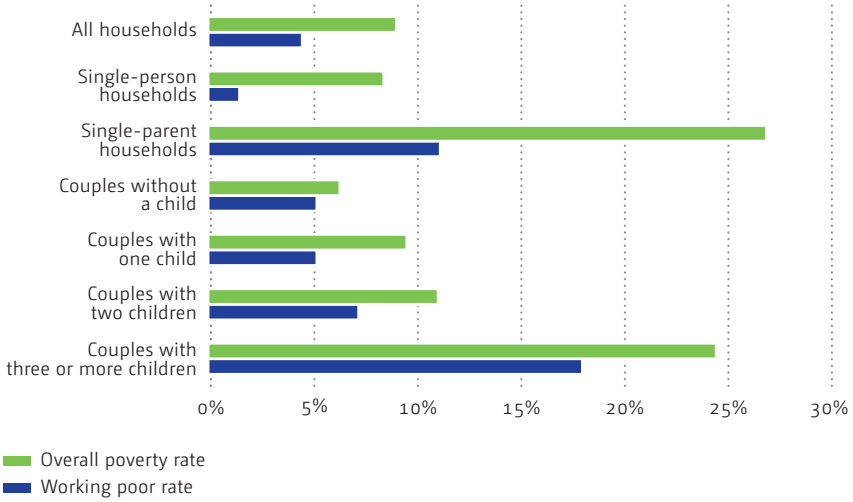
Today, around 37% of the Swiss population live alone, while, among family households, the number of single-parent households has risen slightly (→ Figure 9). In 2007, 13.5% of children were living in single-parent families. Young people between the ages of 15 and 19 feature most prominently in this category, since one in six young people aged 15 to 19 only lives with one of his/her parents (*FSO, 2008n*). At the same time, it has been established that children living with only one parent, or children from large families, are particularly at risk of poverty (→ Figure 10).

A **family household** is a household made up of at least a nuclear family, consisting of a couple with or without a child or children, a parent with a child or children, or an adult person living with one or both of his/her parents (FSO, 2009a)

The **working poor** are people who are actively employed and living in a low-income household. The cumulative total of time worked by all members of the household is at least 36 hours per week (FSO, 2008n). The **poverty line** (basic needs + housing costs + health insurance premiums + CHF 100 per household member aged 16 years or over, as defined by the Swiss Conference on Social Welfare) for one-parent families with two children was CHF 3,800 in 2005 (no distinction was drawn between the individual cantons). If, after deduction of social insurance contributions and taxes, the household income lies below the poverty line, the household is deemed to be poor *(FSO, 2009a)*.

10 **Poverty rate and working poor, by household type, 2006**

Data: FSO



On a theoretical level, it can be argued that, in addition to the economic resources of parents, the number of parents present in a family, the number of children in the family, the number of years between the birth of each child, the position of the individual child within the family and the gender of an individual's siblings may have a beneficial or detrimental impact on the education process (see, for example, *Haveman & Wolfe, 1993,* or *Wolter & Coradi Vellacott, 2003, 2004*).

In large families, siblings are required to share the available resources (monetary and non-monetary resources, such as the parents' attention) and this can give rise to different educational pre-conditions from those that would be the case in small families. The mere fact of a family having several children is not necessarily a disadvantage, however, if the parents are able to purchase the missing resources (e.g. day-care). Research has shown that not having a room of one's own can have a negative impact on academic achievement (see *Goux & Maurin, 2005*). The likelihood of a child not having a room of his/her own increases with decreasing financial resources and with a larger number of siblings, highlighting the importance of a family's living conditions even in a state-run, non-fee-paying education system.

The PISA results for Switzerland did not reveal any overall disadvantage for children from single-parent households. It has, however, been shown that young people who do not live with their natural parents or step-parents but rather with their grandparents, relatives or other persons, tend to perform less well at school than other children (see *Coradi Vellacott & Wolter, 2002*).

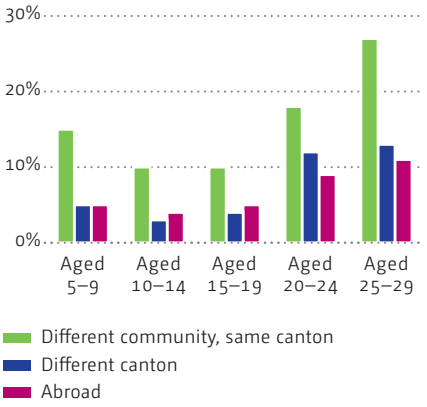
Change of residence

An additional point of importance for the education system is the geographical mobility of those seeking education, and, more specifically, the fact of families with children or young people who are attending school moving from one community to another. This affects student numbers in the individual communities and can therefore intensify regional fluctuations (→ *Demographics, page 38*). The job market now requires the workforce to be more geographically mobile so that local job-market needs can be satisfied more efficiently in qualitative and quantitative terms (optimum resource allocation). These needs can give rise to a situation where increasing numbers of adults are required to be geographically mobile in order to fully exploit their labour market potential. Despite this particular change, moving house to a different location tends to be more of a small-scale phenomenon in Switzerland, and hence only a small percentage of children of compulsory school age are affected by relocations of this type. Only around 5% of children of compulsory school age moved to a different canton at least once during the period 1995 to 2000 (→ Figure 11). However, the education system itself may very well be the reason why mobility is not higher. Differences in school structure and curricula from one canton to another could be obstacles to mobility within Switzerland. One of the factors that suggests this could be true is that, over the last 90 years, the number of people commuting to work outside the community in which they live has constantly risen, and an increasing number of workers are commuting over ever longer distances to work. In 2000, around 57.8% of all employed persons were commuters who worked outside the community in which they lived *(FSO, 2003)*.

11 **Mobility of young people by age group, 2000**

Data: FSO

The graph shows a comparison between place of residence by age group in 1995 and 2000. Around 5% of children aged between 5 and 9 in 2000 had moved to a different canton during the previous five years.



The Federal Statistical Office subdivides employed people into three groups on the basis of their **commuting habits** – individuals who do not need to commute to work (working at home or without a fixed work location), individuals who commute to work within their own community (local commuters) and those who commute to a different community or to another country (cross-border commuters) (FSO, 2003).

Young people of school age

The role of the education system is to educate children and young people who, themselves, are subject to the influence of society and the parental home. In practice, this means that, over time, the education system has to accommodate constantly changing students. In other words, not only does the education system exert an influence on young people, but the young people, in turn, exert an influence on the education system. Two topics that are frequently at the centre of discussions in the media relate to young people's behaviour (juvenile delinquency, violence at school, drug-taking, etc.) as well as to their motivation and attitudes towards learning. A selection of these topics (weight, consumption of psychoactive substances, juvenile delinquency and teenage pregnancy) will be examined in more detail in what follows. The potential positive effects that the education system can have on undesirable behaviour (i.e. whether education can prevent criminality, for example) are discussed in the *Chapter Cumulative effects, page 269*. The following sections discuss aspects of juvenile behaviour and the characteristics of young people as external framework conditions for the education system.

A general and basic problem lies in the fact that it is extremely difficult to trace developments in the characteristics of young people over time due to the lack of standardised, repeated surveys. In other words, it is difficult to say whether the young people of today really differ substantially from the young people of the past. What is more, there are very few reliable research results on the extent to which the behaviour or attitudes of young people actually affect or change the education process.

Body weight

In addition to the physical consequences of being overweight, we must not forget that there can also be psychosocial effects. These may manifest themselves in the form of poor academic achievement, social exclusion and a lack of self-confidence *(Steffen & Oehling, 2008)*. Despite this, empirical research has demonstrated that overweight children and young people show a level of academic achievement similar to that of children and young people of normal weight *(Kaestner & Grossman, 2008; Fletcher & Lehrer, 2008)*. In the case of girls, being overweight during the first four years of schooling can nevertheless have a negative effect on academic achievement *(Datar & Sturm, 2006)*. A recent national study determined that 17% of all boys and 19% of all girls (aged 6 to 12) in Switzerland are overweight *(Zimmermann, Gubeli, Puntener et al., 2004)*. This finding was also confirmed by monitoring student weight records kept by the school medical services in the cities of Basel, Bern and Zurich. There are clear differences in the distribution of overweight children across the various age groups and levels of education. For example, around 16% of children in pre-school are overweight but this figure rises to 22% for primary, lower-secondary and upper-secondary education *(Stamm, Ackermann & Frey et al., 2008)*.[1] According to the Swiss Federal Statistical Of-

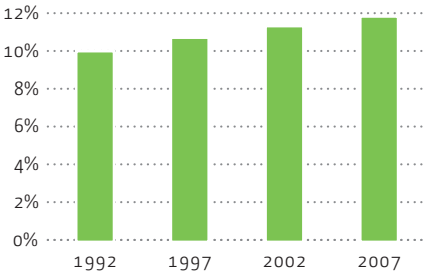
1 Two possible explanations for this were considered in the study: a) migration background: children of foreign origin are twice as likely to be overweight as Swiss children and b) the

fice, the proportion of overweight young people and young adults has risen only slightly over the past 15 years (→ Figure 12). Since it was the young people themselves who provided the weight information used for this study, it should be assumed that the figures are on the low side. It is also reasonable to assume that distortions associated with self-supplied information remain roughly constant over time and, on this basis, we can therefore conclude that the past few years have witnessed only a slight increase in the proportion of overweight young people and young adults.

12 **Youth overweight trends in Switzerland, 1992–2007**

Proportion of 15 to 24-year-olds who are overweight

Data: FSO

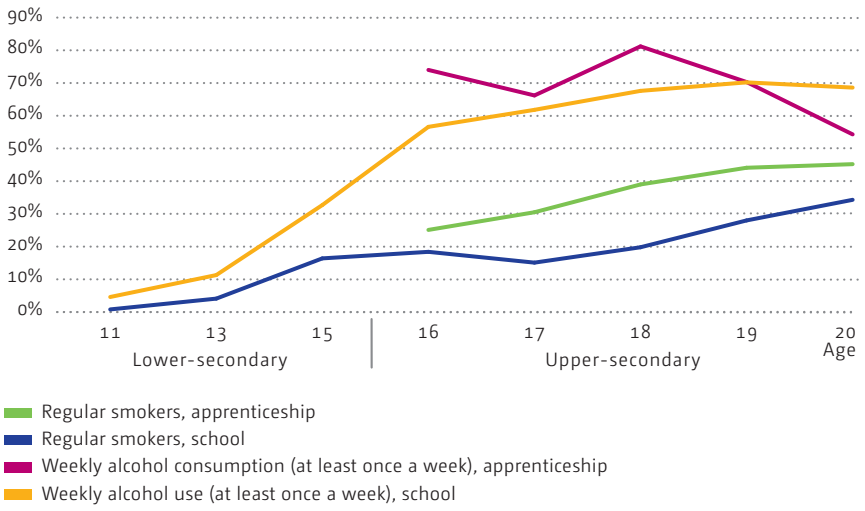


Consumption of psychoactive substances

It must be assumed that both early access to alcohol and the frequency of alcohol consumption have a substantial impact on the rate of addiction and problem behaviour among young people *(Narring, Tschumper, Inderwildi Bonivento, 2002)*. Problem behaviour of this type can give rise to an increase in violence and affect the academic achievement of young people in a school setting as well. A substantial increase in the consumption of the majority of illegal psychoactive substances can be observed among Switzerland's young people, but consumption of legal substances (such as cigarettes or alcohol) and of cannabis has fallen *(Gmel, Kuntsche, Wicki et al., 2009)*. The most frequently consumed psychoactive substance among young people is alcohol. Though girls continue to consume less alcohol than boys, the difference between the sexes has become less pronounced over the past few years (*Narring, Tschumper, Inderwildi Bonivento, 2002,* and *Schmid, Graf, Delgrande Jordan et al., 2008*). Young people enrolled in schools drink and smoke significantly less than young people enrolled in an apprenticeship.

13 **Proportion of young boys who smoke and drink alcohol, by age, 2002**

Data: *Narring, Tschumper, Inderwildi Bonivento et al., 2002, and Schmid, Graf, Delgrande Jordan et al., 2008*



education of the parents: children whose parents hold tertiary-level A or B qualifications are up to four times less likely to be overweight than children whose parents lack post-compulsory qualifications.

As the trends depicted here in Figure 13 are based on data taken from two different studies, it is impossible to judge whether these differences are due to a selection effect. It is also not clear whether young people enrolled in an apprenticeship are the same young people who regularly smoked and consumed alcohol prior to commencing their apprenticeship. As far as the difference between school students, on the one hand, and young people in apprenticeship, on the other, is concerned, this could also be attributed to the fact that most young people in an apprenticeship earn a regular income and therefore have a greater amount of disposable income to spend on alcohol and cigarettes. The fact that the differences decrease as the young people become older also points in this direction.

When analysing these figures for smoking and alcohol consumption, it should be remembered that young people who are not enrolled in upper-secondary education (i.e. around 10% of each cohort) were not included in the survey. It should therefore be assumed that the values for smoking and alcohol consumption will be even higher for some of these young people.

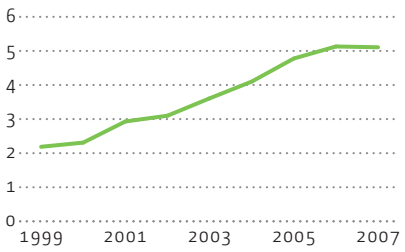
Depending on the age and the development of the young people in question, smoking and weekly alcohol consumption will not necessarily have a negative impact on school and academic achievement. The situation is quite different, however, for young people who take soft or hard drugs. Some 12% of males and 5% of females between the ages of 15 and 24 in Switzerland regularly consume cannabis *(FSO, 2008p)*.

Increased cannabis consumption significantly increases the risk of not achieving a school-leaving qualification at all, or only achieving one at a lower level *(Martin, Swift & Copeland, 2004)*. The consumption of cannabis triggers attention disorders, affects the ability to concentrate, reduces motor skills and limits short-term memory. The potential chronic effects include health-related consequences and also the impairment of memory and perception *(Narring, Tschumper, Inderwildi Bonivento, 2002)*. Nevertheless, it is not clear whether the consumption of cannabis has a causal effect on academic achievement. According to a long-term study from New Zealand *(Fergusson, Horwood & Beautrais, 2003)*, the effect is an indirect one, i.e. it is the social environment in which the young people grow up that simultaneously affects the likelihood of their taking cannabis and their academic achievement.[2]

Juvenile delinquency

14 **Juvenile offence trends, 1999–2007**

Juvenile offences: sentences per 1000 people aged between 15 and 17 within the resident population, punishable offences involving bodily harm or death, under Articles 111-136 of the Swiss Criminal Code.
Data: FSO



Juvenile delinquency can affect the educational prospects of both victims and perpetrators. The victims of juvenile delinquency in particular may well suffer from physical or mental damage, which may manifest itself in an unwillingness to take part in education or in a drop in academic achievement. Juvenile delinquents are generally less motivated at school than their non-delinquent counterparts (see, for example *Ribeaud & Eisner, 2009,* or *Moret, 2006*). Thus far, no unequivocal evidence has been put forward to confirm whether or not juvenile delinquency affects academic achievement (see *Moret, 2006; Wilmers, Enzmann, Schaeffer et al., 2002*) and truancy (un-

2 The study provided no evidence of a reverse causal link. In other words, there was no indication that poor academic achievement increased the likelihood of cannabis consumption.

authorised absence from school) (see *Wilmers, Enzmann, Schaeffer et al., 2002*, and *Stamm, Niggli, Templer et al., 2007*).

Since the 1990s, crime statistics kept by the police reveal that Switzerland has seen a significant increase in juvenile delinquency – especially with regard to offences involving bodily harm or death (→ Figure 14).

It is still unclear whether the reported increase in cases involving bodily harm or death corresponds to an actual increase in acts of violence and/or whether this is due to other factors, e.g. greater willingness on the part of victims to report crime (possibly resulting from greater public awareness of the problems associated with violence) and a greater willingness on the part of the police to record and investigate such offences.

Surveys into self-reported delinquency or surveys conducted among the victims should enable us to determine the true extent of juvenile delinquency.[3] In Switzerland, a number of surveys have been conducted (see for example, *Killias, Lucia & Lamon, 2004,* or *Ribeaud & Eisner, 2009*). Although from the statistics it would often appear that juvenile delinquency is increasing to a much greater extent than suggested by surveys, the reasons for this are the subject of heated discussion among experts (see the discussion in *Killias, Lucia & Lamon, 2004,* or *Ribeaud & Eisner, 2009*, or *FSO, 2007e*). Hence no firm conclusions can be drawn as to whether juvenile delinquency has, in fact, increased.

Irrespective of the precise development in the juvenile delinquency situation, violence to and by young people is a reality, including in an educational context (bullying). A current investigation conducted in Zurich reveals that around 25% of juvenile crimes take place in school or on the way to and from school. The study also noted a continual increase in low-level forms of violence within an educational context. Severe forms of violence such as robbery, sexual violence and physical injuries, however, tend to take place more in a leisure setting than in the school setting *(Ribeaud & Eisner, 2009)*.

Bullying includes all forms of harassment and tyrannising that take place at school and on the way to and from school, irrespective of whether physical violence is used or not. Respondents were given the opportunity to indicate how frequently during the past year they had observed, been a victim of or carried out five types of violence typically associated with school (hitting/kicking, threatening/blackmail, ridiculing/insulting, destruction of property, sexual harassment) *(Ribeaud & Eisner, 2009)*.

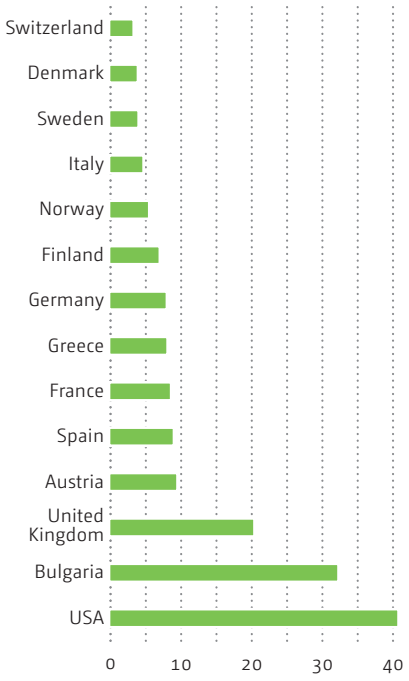
Teenage pregnancy rate

Teenage births generally undermine the educational prospects of the young mothers involved, since the duties involved in caring for and raising a child are difficult to reconcile with studying. The fact that young mothers are forced to cut short their own educational path will subsequently have a negative effect on their job-market prospects, increasing the likelihood that their household finances will be very tight, at least during the early years of their child's life. This, in turn, can also lead to a situation where the educational path of the children of teenage mothers is similarly undermined (see *Francesconi, 2008*). For this reason, teenage births are regarded in a number of countries as one of the most acute social problems that exist.

Despite this possible combination of negative consequences of a teenage birth, the causal effects are not fully understood. More recent studies have shown that a young mother's educational path is not so severely shortened by giving birth when one considers the fact that most teenage mothers fall into the category of those students who would have been less likely to re-

15 **Teenage births – an international comparison, 2005**

Births per 1000 women aged 15 to 19
Data: Eurostat; *Martin, Hamilton, Sutton et al., 2009*



3 It must be assumed, however, that public perception may have influenced the statements made in these surveys as well.

main in education for a long time (see *Ashcraft & Lang, 2006,* or *Fletcher & Wolfe, 2008*). That having been said, however, education can play a role in reducing the likelihood of a teenage pregnancy in the first place. Studies examining the impact of longer periods of compulsory education on the likelihood of teenage pregnancy (see, for example, *Black, Devereux & Salvanes, 2008a*) have found that remaining in education for a longer period of time significantly reduces the number of teenage births.

In Europe, the number of teenage births differs considerably from country to country. With an average of 3.5 births per 1000 women between the ages of 15 and 19, Switzerland has one of the lowest (and continually declining) rates of teenage births in Europe and by comparison with the USA. In Switzerland too, however, teenage mothers feature particularly prominently among the group of women who lack post-compulsory qualifications *(FSO, 2005a)*. As mentioned earlier, it is unclear which is the causal factor.

Economic factors

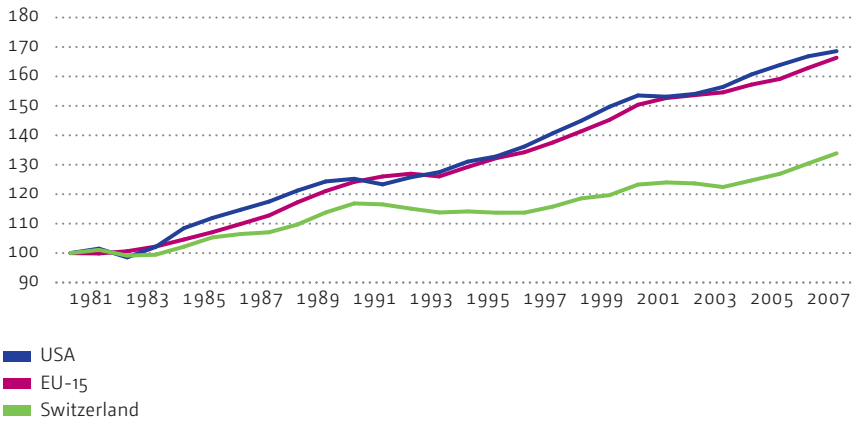
Growth

It is the growth in a country's Gross Domestic Product (GDP) which provides the basic foundation of resources for that country's development. If distributable income rises, it becomes easier to fund public expenditure. At the same time, if the economy is growing, less conflict is to be expected over the distribution of public expenditure. Since the education system in Switzerland is publicly funded for the most part, it is clear just how important economic growth is for this funding.

16 **Per capita GDP at 2000 prices, 1981–2007**

Data: OECD

Real GDP, index 1980 = 100



For two decades now, growth rates for the Swiss economy have been among the lowest in Europe and the OECD. The development in Switzerland's GDP over the past 25 years can, however, be broken down into four phases. Up until the 1990s, Switzerland's development ran largely in parallel to that of

the EU (formerly the EC) and the USA. In the 1990s, however, Switzerland experienced a period of obstinate stagnation, without any growth. This period of stagnation meant economic growth in Switzerland fell behind the growth experienced in other countries. Since 2000, however, Switzerland has once again been able to keep pace with the growth rates in other countries (there was a downturn in the economy in 2001–2003, followed by increased growth since 2004). Switzerland is still, however, lagging behind with a lower growth level as a result of the prolonged period of stagnation in the 1990s. The global economy as a whole is expected to slow down somewhat in the coming years *(SECO, 2009)*. It is unclear whether Switzerland is better equipped for this new phase than other countries. If this decline in economic growth continues for only a short time, it will have no negative consequences on funding for the education system. If, however, there were to be a lengthy phase of economic weakness, then public resources would become limited, and expenditure on education would also come under pressure.

Public expenditure

Approximately 20% of public expenditure goes on funding education (→ Figure 17). The lion's share of this is paid by the cantons (more than 50% of the expenditure).

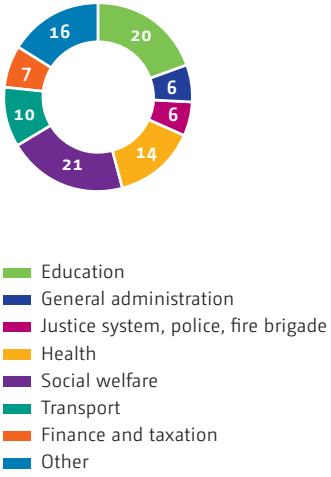
Education competes with other areas for funding and, in particular, with social insurance. Today, total public expenditure on unemployment insurance and disability insurance already amounts to approximately 40% of the total public expenditure on education and, as the economic crisis progresses, more funding will need to be channelled into social insurance. The resources available for education in future will depend on a number of factors. Generally speaking, the economic situation and therefore the state of public budgets are the most important factors. The relative importance of each area of public expenditure will be established on the basis of political considerations, and it is not clear whether the needs of the education system will prevail over other needs.

Factors that exert a particular influence on this distribution process formed the subject of a retrospective empirical study (see *Grob & Wolter, 2007*). This study revealed that, at cantonal level, the proportion of foreign resident population, public revenue and the degree of urbanisation all have a positive effect on the amount spent per student, while the proportion of pensioners, by contrast, has an extremely negative effect on the level of education expenditure. These results therefore lead us to the conclusion that the changes in preferences that accompany demographic developments (→ Figure 5) are more likely to have a negative impact on the willingness of citizens to pay for public education (see *Cattaneo & Wolter, 2009a; Wolter, 2009*).

17 **Public spending, in per cent, 2006**

The Confederation, cantons and communities are collectively referred to as the public sector.

Data: FSO

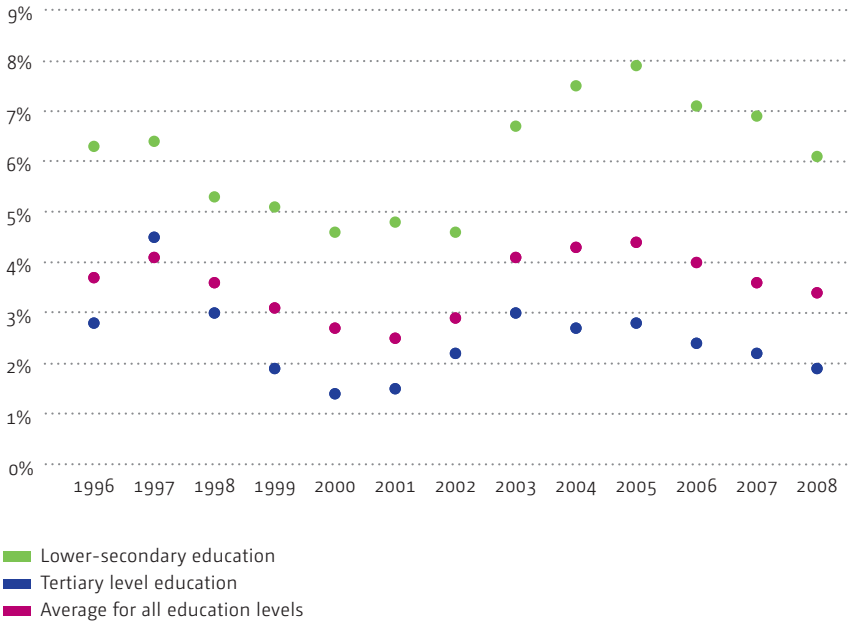


Structural change

Following the second structural change in the Swiss economy – the development of the tertiary sector (services) at the expense of the second sector (industry) – a further structural change is currently taking place within the Swiss economy, where an increasing number of occupations and

professions in the services sector now require tertiary-level qualifications. This has had an impact on job profiles and led to correspondingly higher skill requirements for employees. As a result, the job-market position of those who lack post-compulsory qualifications is becoming increasingly difficult. While, in the past, holders of lower-secondary qualifications always experienced higher unemployment rates than holders of post-compulsory qualifications, their employment prospects always improved considerably whenever the economy was doing well. For the past ten years or so, the situation has been different. The unemployment rate for holders of lower-secondary qualifications has structurally decoupled itself from the average unemployment rate for Switzerland as a whole. Compared to previous decades, the difference between the two unemployment rates has practically doubled, to the detriment of the less well qualified (→ Figure 18). This is an interesting observation, since most foreign nationals migrating to Switzerland hold tertiary level qualifications. The influx of foreign nationals has thus (scarcely) led to greater unemployment among holders of lower-secondary qualifications (→ *Migration, page 40*). In other words, the major shift in the qualification profile of migrants has clearly responded to changing skills requirements on the Swiss job market. The current problem, however, and the problem that will need to be solved in future lies in reducing what is still an excessively high number of poorly educated adults (→ *Chapter Continuing education and training (CET), page 253*) and the number of young people without upper-secondary qualifications, since their job-market prospects are unlikely to improve significantly even in periods of economic prosperity.

18 **Unemployment rate by education level, 2nd quarter of each year, 1996–2008**
Data: FSO



Compulsory education

Summary

19 **Primary school and lower-secondary education in figures**

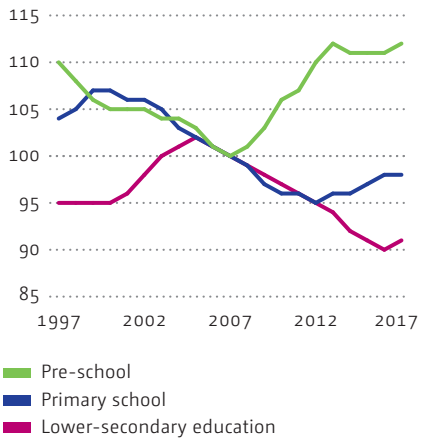
Data: FSO

Pupils in 2007/08		
Pre-school	151,699	16%
Primary school	445,136	47%
Lower secondary education	298,368	32%
Special needs education	44,568	5%
Teaching staff (FTE) 2006/07		
Pre-school	8,200	14%
Primary school	29,400	48%
Lower secondary education	23,100	38%
Expenditure (in CHF millions) 2006		
Pre-school	999	7%
Compulsory education	11,440	83%
Special needs education	1,310	10%

20 **Statistical trend in pupil numbers 1997–2017**

Data: FSO

2007 = 100



The principle of cantonal autonomy is very important to Switzerland, due to its federal structure and multilingualism. This same principle, however, has given rise to a complex educational landscape, which has developed organically over time and been adapted to local conditions. The large-scale international educational assessments that Switzerland has taken part in (especially PISA) have confirmed that Switzerland is achieving relatively good results on the whole, especially in the fields of mathematics and sciences, but they have also highlighted a number of problems. What is especially striking is the large number of students who, having reached the end of compulsory education, do not possess the necessary basic skills, especially in reading. The PISA studies also clearly revealed that academic achievement in Switzerland depends to a large extent on a student's socio-cultural background *(FSO/EDK, 2007)*. More detailed analyses of the PISA data, together with other studies, have also demonstrated that educational opportunities vary according to the type of school and are distributed differently from one region to another (*Ramseier & Brühwiler, 2003*; *FSO/EDK, 2005*; *Kronig, 2007*). Most cantons in Switzerland operate a selective and strongly segregated education system in which the streaming mechanisms are not based solely on performance but also influence educational opportunities through social characteristics *(Häfeli & Walther-Müller, 2005; Kronenberg, Besse, Lischer et al., 2007)*. As in other countries facing problems of a similar nature, solutions are being sought in Switzerland to ensure that learning processes are configured more effectively, learning objectives made more transparent, academic achievements and skills set out more objectively and the education system shaped so as to permit greater integration. In addition, global networking, global competition and increasing mobility mean that Switzerland will require greater coordination of objectives at national level than in the past. Under the auspices of the Swiss Conference of Cantonal Ministers of Education (EDK), the cantons are thus pursuing a joint strategy to harmonise the structures and objectives of the different educational levels through appropriate standards and procedures and thereby to secure and enhance the quality of education provided *(EDK, 2008b)*.

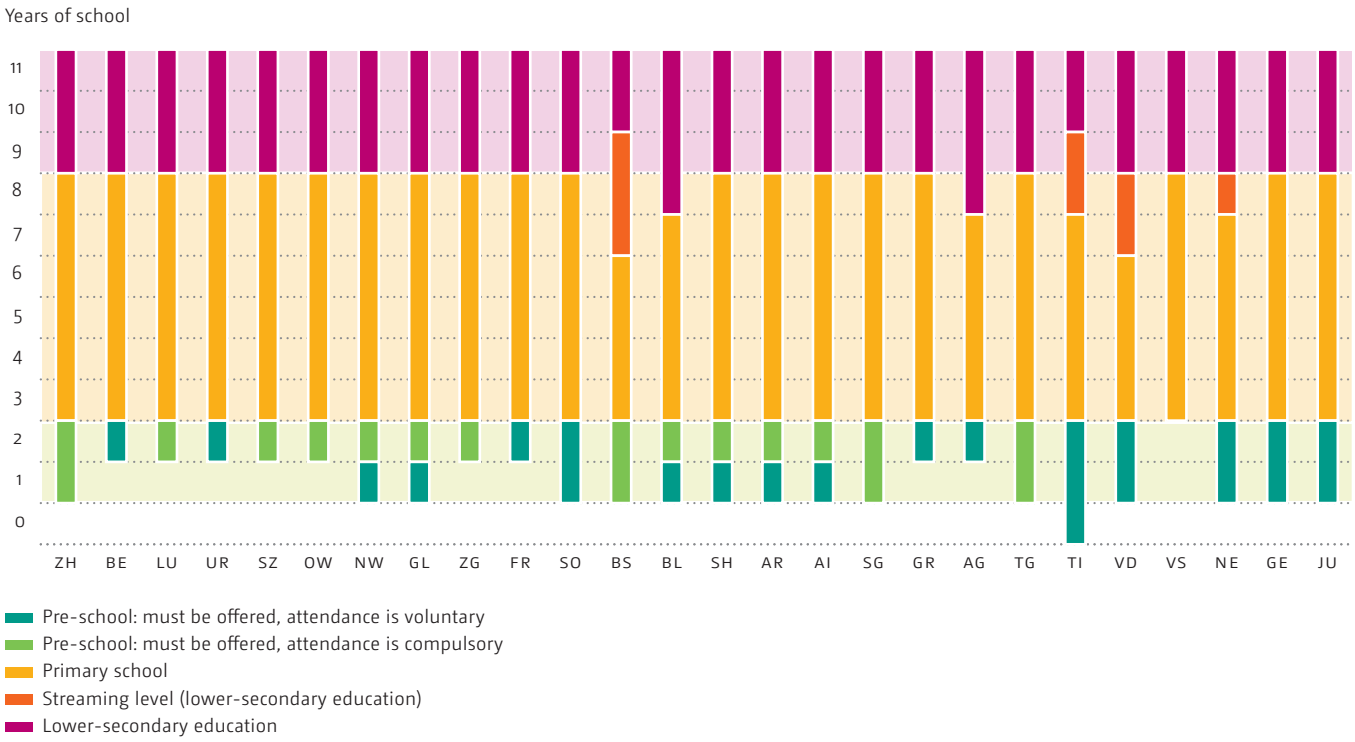
Intercantonal agreements are an important tool for enabling cantons to work together more effectively. During the period under review, two such intercantonal agreements were submitted to the cantons for them to adopt, namely the Intercantonal Agreement on Harmonisation of Compulsory Education (HarmoS Agreement) and the Intercantonal Agreement on Special Needs Education *(EDK, 2007b)*.

Intercantonal Agreement on Harmonisation of Compulsory Education (HarmoS Agreement)

The Intercantonal Agreement on Harmonisation of Compulsory Education (HarmoS Agreement) sets out to harmonise the core values outlined in Art. 62 of the Federal Constitution. The age of entry into education has therefore been set at age 4 (the key date being 31 July). Students will attend primary school, including pre-school or the first learning cycle, for a total of eight

21 **Structure of pre-school, primary school and lower-secondary education and the proposed harmonisation, status: 2009**

Data: EDK/IDES



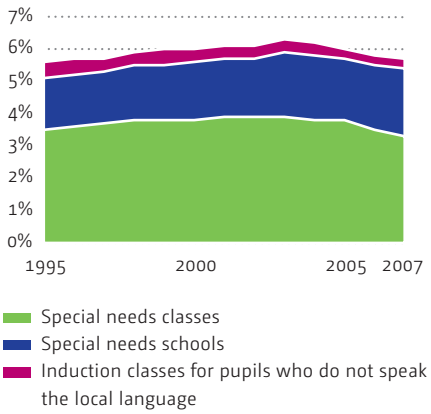
years and will then attend the lower-secondary level for a period of three years. Compulsory education will consist of a total of 11 years in future (→→ Figure 21). The overarching objectives for the various study subjects will also be defined on a joint basis. The HarmoS Agreement obliges all the cantons within a given linguistic region of Switzerland to adopt the same curricula and to coordinate their teaching of foreign languages, while also providing for quality assurance through educational standards and regular monitoring. It similarly proposes the provision of school-based day-care facilities in accordance with observed needs. Binding educational standards specify the objectives that must be achieved in areas such as the school's language of instruction, foreign languages, mathematics and science at the end of Year 4, Year 8 and Year 11. This has led to a paradigm shift where increased focus is being placed on skills.

Intercantonal Agreement on Special Needs Education

As a result of a reallocation of tasks between the Confederation and the cantons, the cantons now have responsibility for all the professional, legal and financial aspects of special schooling for children and adolescents, as well as for special needs measures. The special needs field thus comes under the remit of compulsory education, and cooperation between the cantons will be governed by their Intercantonal Agreement on Special Needs Education. In accordance with the provisions of the Equal Opportunities for the Disabled Act (SR 151.3), integration measures will take precedence over separation measures. The intercantonal agreement also provides for the creation

22 **Number of pupils in special needs education, 1995–2007**

Data: FSO



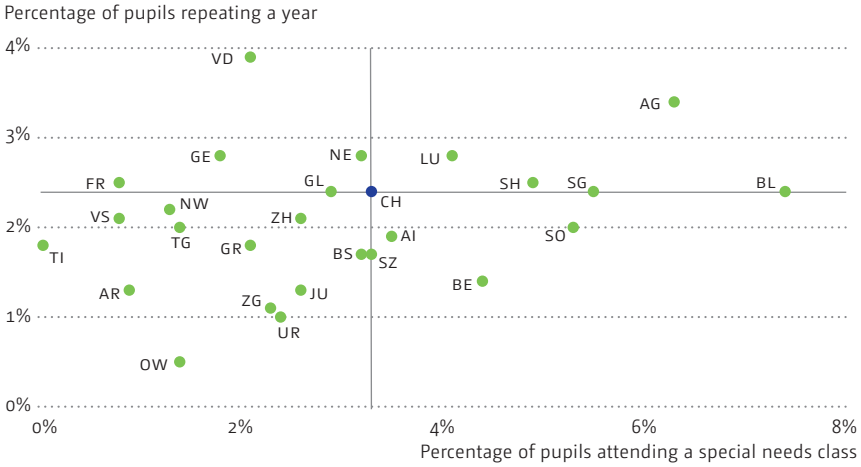
of uniform terminology and for minimum process and quality standards. A variety of support measures, institutions and treatment programmes are available for students with special educational needs from birth up to age 20. The intercantonal agreement sets out the basic provision, which includes treatment programmes for the early years and peripatetic support, counselling and treatment programmes during compulsory education. Three possible compulsory education options are available for special needs students: attendance of the regular class with individualised support, attendance of special needs classes and attendance of special needs schools. If sufficient individualised support is provided within the regular classes, the cantons will not need to create special needs classes. There has been an increasing trend towards the integration of special needs students into mainstream education over the past few years, and this is reflected in the declining number of students being educated in special needs classes (→ Figure 22). The intercantonal agreement will support this move. In the development of concepts and measures for gifted children since the 1990s, priority was given to integrative solutions right from the start. These include the individualisation or enrichment of tuition as well as separate advancement programmes of limited duration *(SCCRE, 2007)*.

In the compulsory education sector as a whole, 44,568 students attended classes or schools with a special needs curriculum in the 2007/8 academic year. The proportion of very heterogeneous classes in this area is very high, averaging 67%. The possible responses to individual needs that lie outside the realm of special needs education include measures for slowing down or accelerating an individual student's educational path, such as delaying or advancing his/her entry into pre-school or primary school, or repeating or skipping a year. Generally speaking, measures to accelerate a student's education are applied with caution, whereas measures to delay progression and/or repeat a year are taken much more frequently.

While no national data are available on the integrated support of special needs students or other educational or therapeutic measures (support teaching, therapy for those suffering from dyslexia, speech therapy, psychomotor support, etc.), statistics are available on special needs schools, special needs

23 **Percentage of pupils repeating a year or attending a special needs class 2007/8**

Data: FSO



classes and the percentages of students required to repeat a year. These percentages are high compared to other countries *(Häfeli & WaltherMüller, 2005)* and differ from one canton to another (→ Figure 23). There are also variations from one linguistic region to another. The overall rate of special needs education and particularly of special needs classes is lower in the French-speaking cantons and Ticino than in the rest of the country and has been falling since the 1990s.

Further national development priorities

Additional central development priorities put forward by the Swiss Conference of Cantonal Ministers of Education (EDK) for the period from 2008 to 2014 include the coordination of foreign language teaching, the introduction of sustainable development as a subject of study, and a smoother transition between lower-secondary and upper-secondary education *(EDK, 2008b)*

In the linguistic field, the specified objectives are to develop linguistic skills in the school's local language as of a child's entry into school, to develop a robust command of a second national language of Switzerland, as well as English, and to provide the opportunity for students to acquire skills in a third national language. To achieve these objectives, additional support is being provided to enhance the level of linguistic and teaching skills acquired during teacher training. Teaching in the first foreign language (either a second national language of Switzerland or English) will be provided from the start of Year 3 at the latest, while teaching in the second foreign language will commence no later than in Year 5. Students whose native language is not the school's language of instruction are entitled to receive support teaching in the school's language of instruction, and organisational support is provided for courses in the student's native language and culture.

The concept of sustainable development will be incorporated into the existing range of subjects and topics covered and, in addition to other interdisciplinary subjects, will constitute a fixed component of curricula and teaching materials, of initial training and in-service training for teaching staff, and also of quality development for schools *(EDK, ARE, FOEN et al., 2007)*.

«Education for Sustainable Development (ESD) aims at enabling individuals to construct an ecologically compatible, economically efficient and socially fair environment, while keeping global factors in mind» (definition from the Swiss UNESCO Commission).

The interface between compulsory education and upper-secondary education will be optimised in order to ensure that 95% of young people obtain an upper-secondary level qualification by 2015. Research will be conducted into the factors governing a successful transition. Occupational profiles will be drawn up to make the requirements for vocations requiring apprenticeships more transparent, and case management support will be provided for difficult transitions.

Since the 1990s, the cantons have been responsible for integrating information and communication technologies (ICT) in teaching and in schools. From 2000 onwards, this process was intensified and received support from the Confederation and from private businesses within the «Public-Private Partnership – Schools on the Internet» (PPP-SiN) initiative, which formed part of a limited-term Federal Act (2002–2007). As a study conducted in 2007 showed, this initiative has now led to almost every school being equipped with computers (99%, as opposed to 82% in 2001), to increased internet access (95% of schools, as opposed to 66% in 2001) and to more intensive and competent use of ICT in the classroom. While most of the teachers questioned make use of ICT when preparing their lessons, one-third use it sev-

eral times a week in the classroom and one-fifth organise activities several times a week where students can use a computer. Approximately a quarter of teaching staff rate their ICT skills as either good or very good *(Barras & Petko, 2007)*. Alongside this Swiss study, a study conducted by the OECD *(2009b)* concluded that good ICT infrastructure is a necessary, but by no means the only, prerequisite for effective integration of ICT. In its 2007 strategy for ICT and Media, the Swiss Conference of Cantonal Ministers of Education (EDK) focused on driving forward the integration of ICT at all levels of education. This was done in order to ensure that all students at compulsory education level become ICT-literate *(EDK, 2007c)*.

The Swiss Centre for Information and Communication Technologies in Education, which supports efforts to integrate ICT in the classroom and schools, was set up by the Confederation (OPET) and the cantons (EDK) in 1998. The Swiss Conference of Cantonal Ministers of Education (EDK) has also been operating the Swiss education server in collaboration with the Confederation (OPET and SER) since 2001.

Regional developments

Within the different linguistic regions of Switzerland, the priority will be to ensure the introduction or drafting of uniform curricula that are compatible with the provisions of the HarmoS Agreement (*Lehrplan 21*, *Plan d'études romand*, PER).

Following an initiative of the eastern division of the Swiss Conference of Cantonal Ministers of Education (EDK), the German-speaking and bilingual cantons have launched the 4-to-8 Project to test and assess two models intended to ease the transition from pre-school to primary school (combining two years of pre-school with the first or first two years of primary school). The objectives of a new first learning cycle where children learn in mixed-aged groups for 2 to 4 years *(three-year model)* or 3 to 5 years *(four-year model)* enables a flexible approach to each child's entry into the education system, a smoother transition to systematic school-based learning and the avoidance of early selection through integrated support. Interim results of this initiative have been available since 2008, and the final report is expected to be released in 2010.

A need for action has arisen in a number of cantons as a result of the requirements imposed by the Intercantonal Agreement on Harmonisation of Compulsory Education (→ Figure 21). A number of cantons are seizing this opportunity to cooperate more closely with one another. Alongside the French-speaking cantons, which have entered into an agreement with regard to the implementation of HarmoS *(Convention scolaire romande)*, the four Cantons of Aargau, Basel-Stadt, Basel-Landschaft and Solothurn have formed the North-West Switzerland Education Area in order to further develop their education systems in tandem. Finally, the so-called «passe-partout cantons» (Bern, Basel-Stadt, Basel-Landschaft, Solothurn, the German-speaking area of the Canton of Fribourg and Upper Valais) have entered into an agreement to coordinate foreign language teaching and the number of lessons required for this.

System control and quality development

Alongside the intercantonal agreements governing the benchmark values at national level and the coordination of major school development projects at intercantonal level or within individual linguistic regions, the most important system-control level is that of the cantons themselves. A large number of cantons are in the process of producing new control and quality development models for individual schools or for their entire education system. At the heart of these initiatives comes a reallocation of responsibilities and remits to schools and communities, and also the reform of school inspectorates.

24 **Levels and approaches to school evaluation and school improvement**
Information: SCCRE

	Internal Approach	External Approach
At individual school level	Internal school evaluation, self-evaluation ⟶ school improvement and improvement of teaching	External school evaluation, evaluation by third parties ⟶ recommendations for improvement, checks to monitor implementation
At the level of the cantonal school system	Administrative monitoring ⟶ improvement of administrative activity	System evaluation ⟶ recommendations for reform, checks to monitor effects

Various cantons have concepts for quality assurance and quality development. Some of these concepts include a provision for cantonal monitoring *(EDK/IDES, 2007)*. One of the most important reform initiatives since the mid-1990s involved vesting increased responsibility and decision-making power in individual schools and the creation of executive boards within schools. This development was first implemented in the German and Italian-speaking regions of Switzerland and was not introduced in the French-speaking part of the country until some time later *(ibid.)*. This created the basis for a more goal-oriented form of management and for ensuring the permanent development, monitoring and further improvement of the quality of schools and the teaching provided. With this approach, quality is perceived in a dynamic fashion, with schools as «learning organisations» *(Rolff, 1998)*, where quality pervades the interaction between teachers, the school culture and the shaping of tuition. The management of teaching and learning and responsibility for the teaching process is in the hands of the teaching body and the executive board. Both sides guarantee quality assurance through self-evaluation measures *(EDK, 2008d)*. The supervision function traditionally assumed by school inspectors is undergoing a process of change, with the advisory and supervisory roles being separated. Local school authorities will primarily be responsible for carrying out supervisory functions of an organisational and administrative nature. A large number of cantons are setting up external evaluation offices and specialist units to supervise their schools, which will check the attainment of quality specifications or the implementation of recommended developments at set intervals. It will also be possible for the results of performance measurements or

assessments of the attainment of standards to be included here (in future). The development of external evaluation has progressed to different extents in the individual cantons *(ARGEV, 2008)* (→ Table 25), and there are still a large number of questions regarding the inclusion of results from performance measurements awaiting clarification *(Bähr, 2003; Husfeldt, 2007)*.

25 **Status regarding the development of external school evaluation in German-speaking and multilingual cantons, 2008**

Information: ARGEV, * Multiple responses were possible

Development status	Number of Cantons	Cantons
Statutory duty to implement external school evaluation in place	14	AG, AR, BE, BL, GR, LU, NW, OW, SG, SO, SZ, TG, ZG, ZH
Initial wave of evaluations completed*	3	GR, NW, SZ
Comprehensive evaluation now underway*	15	AG, AR, BL, BS, FL, FR, GL, GR, LU, NW, OW, SO, SZ, TG, ZH
Pilot phase*	4	BS, FR, SG, ZG
Concept phase*	7	BE, BS, SG, SH, UR, VS, ZG

Support in developing quality

Quality requirements relate to various dimensions of the educational system (input, processes, output) and must also take account of the context in which they apply. Quality development must similarly be based on this complex, multi-dimensional nature and on context. By way of example, we can highlight two quality improvement measures that are under discussion or have already been implemented in a number of cantons: social index-based resource allocation and school networks as support platforms for school development.

Social indexing enables the different burdens on individual school districts to be taken into account when allocating resources. Working on the basis of key data, such as the number of inhabitants or the number of students of non-Swiss origin, unemployment rates, permanent settlement rates and the proportion of different types of dwellings (e.g. single-family houses), a social index is calculated and used as a factor for increasing the resources allocated to a school district as a function of the burden to which it is exposed. A number of cantons have introduced social indexing regulations or are planning to do so (BE, GE, SG, TG, VD, ZH) but the basis and scope of calculation vary considerably. No findings are available as yet on the effects of resource allocation based on social indexing.

School networks provide a means of supporting development processes within schools and networking those involved in these processes. Over the past few years, school networks have been set up at cantonal, regional and national level, and similar processes can also be seen in neighbouring countries, as well as at the international level. Decentralisation and the demand for innovative approaches have given rise to a need for groupings at an in-

termediate level. Networks can secure innovation strategies over the long term and contribute towards greater professionalism, since they pool competence and disseminate it at the same time through horizontal links *(Czerwanski, Hameyer & Rolff, 2002)*. Examples of school networks in Switzerland include the national network of health-promoting schools, the regional network «Language learning in multilingual schools» of the North Western division of the Swiss Conference of Cantonal Ministers of Education, plus countless other cantonal networks: *Schulen mit Zukunft* in Lucerne, *Netzwerkschulen* in Zurich, the *Netzwerk Geleitete Schule* in Aargau and the *Réseau d'enseignement prioritaire Genève*, etc. Empirical research conducted into networks of this type in Germany has shown that the individuals who take part in school networks derive considerable benefits from them. The principal areas addressed by such networks include exchanging teaching ideas, providing motivation and encouragement for implementing innovations in one's own teaching, offering continuing training opportunities to teachers and reflecting on one's own work at school *(Czerwanski, Hameyer & Rolff, 2002)*.

Changes in the teaching profession

Changes within society (→ *Chapter Context, page 37*), coupled with changes in education policy and school structures (see further above in the present chapter), are fundamentally changing the teaching profession. Alongside teachers' primary role of teaching and educating, and their duty to regularly upgrade their skills, teachers are increasingly being required to become actively involved in instructional and school development and also to cooperate with colleagues in their own school, as well as with other experts. Furthermore new challenges for teaching staff are arising in areas such as socialisation, integration and individualised learning *(EDK, 2008c)*. The professional role of teachers is therefore becoming broader and needs to be redefined. A key factor in this regard is not only determining the contents of a teacher's work but also measuring their working hours. Studies conducted on teachers' workloads show that Swiss teachers are subject to time burdens, particularly when compared with those from other countries *(Landert, 2006; Trachsel, Ulich, Nido et al., 2008; OECD, 2008a)*. When considering the future of the teaching profession, issues such as the professional role of teachers, working conditions and opportunities for career development and the acquisition of additional qualifications will become even more important *(Herzog, 2007)* (→ *Chapter Universities of teacher education (UTE), page 225*).

Parental participation

An additional change that is taking place within schools relates to the role of parents *(SCCRE, 2001)*. Parental participation is increasing and is no longer limited to exchanges between an individual teacher and the parent or guardian of each child. Nowadays, parental participation includes whole-class issues, plus issues relating to the teaching body or even an entire school community. Parental participation is also being institutionalised to an increasing degree. It has now been made compulsory by law in the Cantons of Zurich and Ticino. Many other cantons have also stipulated a requirement for

parental participation, but have delegated implementation to the communities. In other cases, parental participation has been delegated to individual schools and incorporated as a point to be monitored within the context of school evaluation. Parents can become involved in education by becoming parent delegates, sitting on school committees, or they can take part in parent bodies (i.e. the parents' council or parents' forum) which work closely with schools *(Mulle, 2009)*.

Attendance at private schools

In most Swiss cantons, the proportion of students who attend (non-subsidised) private schools during the compulsory education stage is low. The figures are 2.8% for primary education and 4.8% for lower-secondary education on average. During the ten-year period from 1997/1998 to 2007/8, the average proportion of students increased by 0.8% at primary level and by 0.7% at lower-secondary level. There are, however, a number of differences between the individual cantons. Basel-Stadt and Geneva stand out in particular, with a share of 7.9% and 15% private pupils at primary level, respectively, and Ticino at 5.4% and the Canton of Vaud at 4.1% are also higher than the Swiss average. These percentages have also grown more sharply in the Cantons of Geneva, Ticino and Vaud.

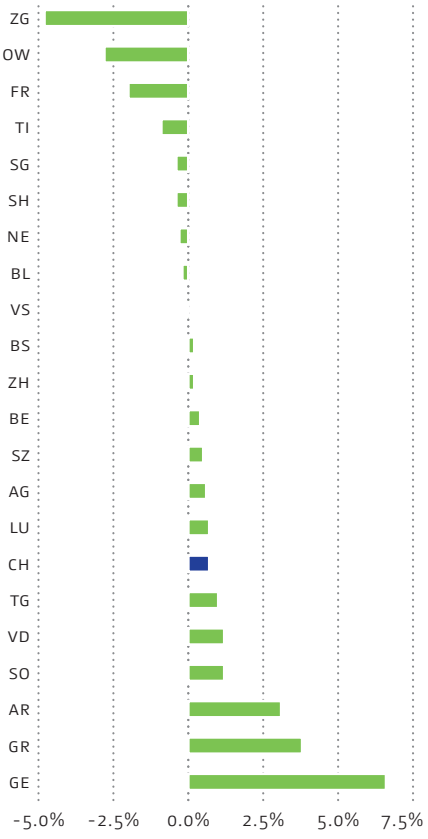
As far as lower-secondary education is concerned, the picture is similar. Here too, the Cantons of Basel-Stadt (12%) and Geneva (17.3%) are well above the Swiss average, and the Cantons of Appenzell Ausserrhoden, Zurich, Zug, Ticino, Thurgau and Vaud are also more than one percentage point above this average. In this regard, the Canton of Geneva also recorded a sharp increase of 6.6% during the ten-year period between 1997/1998 and 2007/8 (→ Figure 26).

The high proportion and sharp increase in the number of young people attending private schools in the Canton of Geneva can be explained by the international nature of the city, the composition of its population and the economic upturn between 1997 and 2007. Half of the students attending private schools are enrolled in an international school, and 65% of those receiving a private education are foreign nationals. Twenty per cent of these students do not actually reside in the Canton of Geneva *(SRED, 2007)*. In the Basel region, the Canton of Zurich and other prosperous areas, schools with a foreign curriculum (international schools) are becoming increasingly popular. According to a study conducted in the city of Zurich, student numbers at traditional private schools with a special (reformed) educational approach are on the decline. There are a slightly higher number of boys at private schools than girls, and the proportion of foreign nationals in private compulsory education is higher than that in the public education sector. According to the same source, prosperous communities in the Canton of Zurich generally have a higher percentage of students attending private school *(Stutz-Delmore & Brammertz, 2006)*.

26 **Changes in the number of pupils attending private lower-secondary schools 1997–2007**

Data: FSO

The five Cantons not included here (AI, GL, NW, JU and UR) did not have any students attending private schools.




35

Pre-school and primary school education

Context

Under the terms of the Intercantonal Agreement on Harmonisation of Compulsory Education (HarmoS Agreement), which was approved by the Swiss Conference of Cantonal Ministers of Education (EDK), primary school education will last eight years in future and will include pre-school education or the first learning cycle. This chapter takes account of this development and covers the entire pre-school and primary school phase. When school-based learning processes commence for children after their fourth birthday, each child has already been exposed to a few years of training, education and care within the family and, increasingly, outside the family too. School-based learning processes also take place within a social context that exerts a considerable influence on them. The following section examines this preceding phase and the social setting for the first phases of school-based learning.

Availability and use of day-care

The Swiss Conference of Cantonal Ministers of Education (EDK) and the Swiss Conference of Cantonal Ministers of Social Affairs (SODK) reached an agreement in 2008 on cooperation in the context of day-care facilities. This term encompasses day-care facilities for children and young people from birth up to the end of compulsory education (or, in the case of special needs education, up to the age of 20). The decision as to whether to use such facilities rests with the parents, and they are required to pay part of the costs. In acceding to the HarmoS Agreement, a canton undertakes to create day-care facilities for children and young people within the age range covered by compulsory education which are both voluntary and reflect the needs that exist within society. Primary responsibility for the intercantonal coordination of day-care for young children (aged 0 to 4) rests with the SODK, while the EDK bears primary responsibility for the intercantonal coordination of day-care for children of compulsory education age. Day-care facilities are provided by public authorities, private institutions or private individuals. The cantons and communities are responsible for issuing permits for such facilities and for quality assurance *(EDK/SODK, 2008)*.

Given that the number of working mothers has steadily increased and the number of single-parent families has also risen, there has been an increase in demand for day-care facilities, both before school and to accompany school *(→ Chapter Context, page 37)*. While the availability of day-care facilities has increased over the past few years, not least thanks to federal funding – since 2003, the Confederation has helped to set up and expand day-care facilities and facilities to complement school, creating around 20,0000 places *(FSO, 2008n)* – demand is still estimated to greatly outstrip supply. A further 50,000 places are still needed, and the lack of favourably-priced day-care facilities is one of the main factors limiting the economic activity of women *(Infras, 2005; MecoP/Infras, 2007)*.

Three structurally different approaches to early-years learning, day-care and education are to be found within Europe:

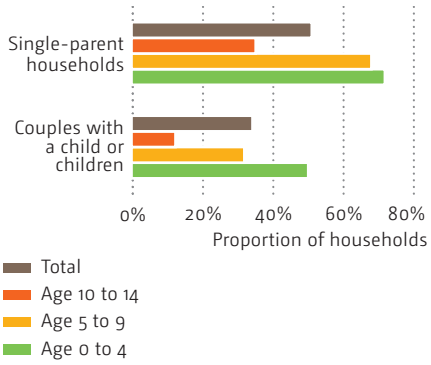
– high expenditure, day-care and education closely integrated, state-run day-care facilities (e.g. Scandinavia and France)
– moderate expenditure, focus on underprivileged children (e.g. Italy, Austria, Germany, the Netherlands, United Kingdom)
– low expenditure, free market, restrictive family policies (e.g. Ireland, Spain, Switzerland) *(UNICEF, 2008)*.

The data situation regarding the use of day-care facilities is precarious. No reliable nationwide data are available, despite the fact that it has been requested for many years *(EKFF, 2008)*. Using data obtained indirectly via the Swiss Labour Force Survey (SLFS), the family report published by the Federal Statistical Office in 2008 shows that day-care is used particularly for young children, and especially for children from single-parent families (→ Figure 27).

In the majority of cases, households wishing to avail themselves of day-care have to find solutions of their own. In over 60% of cases, recourse is had to care provided by private individuals, and especially by relatives (52%). A good quarter of households that place children in day-care facilities use nurseries, all-day pre-schools or school-based day-care (26%). A further 15% send their children to day-care families, while 4% send their children to care facilities over lunch time and after school. The total amount of time spent in day-care is relatively low, amounting to 1.5 to 3 days a week on average *(FSO, 2008n)*.

27 **Use of non family-based day care, by household-type and age of youngest child, 2007**

Data: FSO



Quality of day-care facilities for the early years

As far as day-care facilities for the early years are concerned, it is not only the quantitative aspect that is of importance but, increasingly, the qualitative aspect as well *(OECD, 2001, 2006b; Viernickel & Simoni, 2008; EKFF, 2008)*. Research projects, and especially broad-based longitudinal and long-term studies conducted in Europe and the USA, show that early childhood learning, care and education play a decisive role in the cognitive and socio-emotional development of children *(Räss & Wolter, 2008)*. They also show that the availability of high-quality institutional day-care facilities for underprivileged children gives rise to sustainable improvements in academic achievement *(Rossbach, Kluczniok & Kuger, 2008)*.

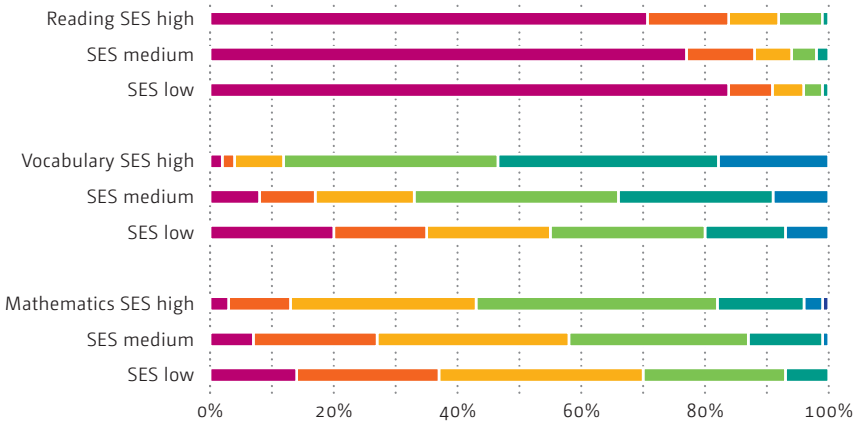
The fact that children in Switzerland enter education under very different circumstances has thrown the spotlight on the early years' phase of education, and it has been realised that there is a need not only for quantitative but also qualitative improvements here *(EKFF, 2008)*. What would seem to be required, in particular, is a holistic, comprehensive education and development concept for the early years *(Fthenakis, 2003; EKFF, 2008; EKM, 2009; Stamm, Reinwand, Burger et al., 2009)*. In addition to increasing the availability of affordable institutional day-care facilities, a more pronounced focus on learning is also required in day-care facilities. In urban centres, projects are underway to provide targeted support for underprivileged children, especially those with a migration background. One focus here is the development of language skills (*Spielgruppen plus* in Zurich, German courses for three-year-olds in Basel, etc.). As by no means all of the children in the target group have access to institutional day-care facilities, projects such as these also place emphasis on helping parents develop the skills needed to raise and educate their children (one example of this being the *Primano* project in Bern).

The abbreviation **SES** stands for socio-economic status. In order to determine socio-economic status, an index was compiled on the basis of the formal educational qualifications held by parents, household income, the number of rooms per person and the number of books in the home (Moser, Bayer & Berweger, 2008).

Taking into account the national and linguistic background of the students concerned, the Federal Statistical Office defines **«very heterogeneous classes»** as classes where at least 30% of students come from other cultures.

28 **Levels of performance achieved upon entry to pre-school, by socio-economic status, 2004**

Data: University of Zurich, Institute for Educational Evaluation



Level I stands for a low level of performance and Level VI for a high level of performance.

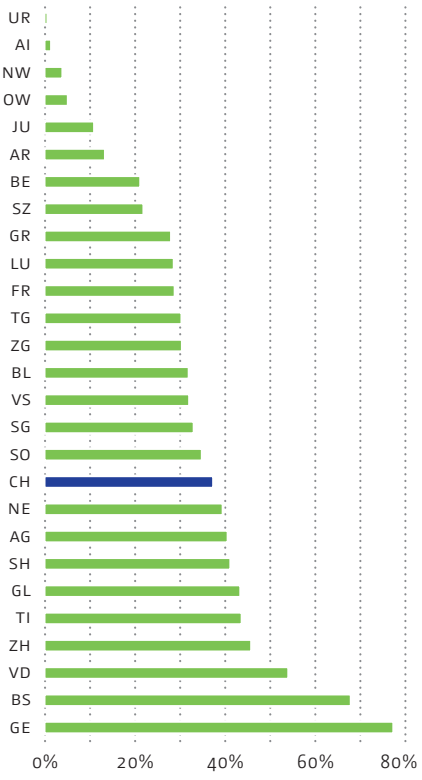
Social segregation and its effects on educational opportunities

As mentioned earlier, considerable differences exist in learning prerequisites and competences even before children enter the pre-school phase *(Moser, Bayer & Berweger, 2008)* (→ Figure 28).

These differences are attributable to differences in social status as well as to the educational background and living conditions of families. A lack of time or financial resources on the part of parents restricts the families' educational, cultural and social resources *(Ditton & Krüsken, 2006)*. Compared to other countries, Switzerland is home to a large proportion of children and parents who were not born in Switzerland, do not speak the school's language of instruction and are also amongst the socio-economically disadvantaged. The increasing social segregation that can be observed in Switzerland is giving rise to a concentration of families that are disadvantaged in this way. The concentration of these families in specific districts or schools can lead to class compositions with negative consequences for the educational development of precisely these disadvantaged children *(Coradi Vellacott, 2007)*. This problem may be encountered on a local level in individual communities or municipal districts but is more pressing in cantons with extensive metropolitan areas, which typically contain a high proportion of heterogeneous classes (→ Figure 29).

29 **Proportion of very heterogeneous classes in primary education, by canton, 2007/2008**

Data: FSO



Considering the different settings in which education is provided, pre-school and primary school education should be designed in such a way as to ensure that children do not suffer multiple educational disadvantages. One way of doing this is to employ social indexing as a basis for resource allocation, as was referred to in the overview section on compulsory education. Other approaches include programmes to increase student language skills in the pre-school phase *(→ Institutions, page 69)* and school-based programmes such as the QUIMS project for improving the quality of multicul-

tural schools in Zurich and the *Réseau d'enseignement prioritaire* (REP) in Geneva. An increasingly educational focus and more prevalent use of day-care facilities are both also expected to have a corresponding positive effect *(Bolz & Schüpbach, 2007; Larcher Klee & Grubenmann, 2008)*.

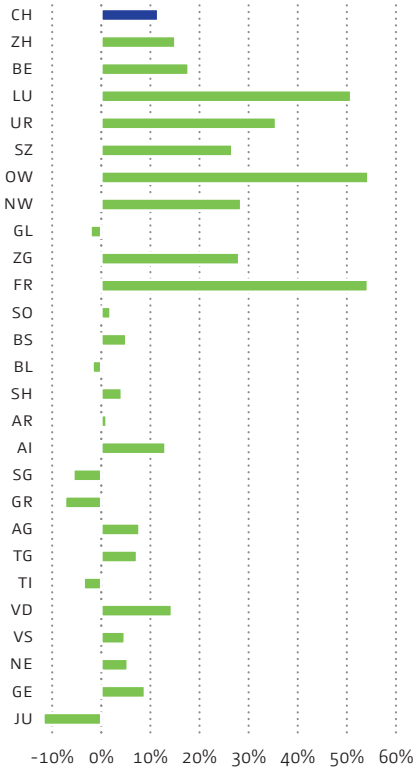
Student numbers and statistical trends

Student numbers in pre-school and primary school education increased up until the late 1990s and have been declining since then. While student numbers in primary schools are expected to continue decreasing until 2013, student numbers in the pre-school phase are beginning to rise again, albeit at a relatively low level. Precise developments in the pre-school phase will nevertheless depend on education policy decisions, and the Federal Statistical Office has differentiated its forecasts accordingly *(FSO, 2008b)*. The FSO first considered the «Trend» scenario where children attend pre-school for longer; it then considered the «Convergence I» scenario, where all children attend pre-school for a period of two years, as set out in the HarmoS Agreement. And, finally, it considered the «Convergence II» scenario, where the reference date for starting school is brought forward somewhat, as is also provided for in the HarmoS Agreement.

Figures 30 and 31 are based on the «Convergence II» scenario and show the trend in student numbers in the pre-school and primary phase in each canton. The results clearly show that in a number of cantons where most, if not all, of the communities provide one-year pre-school facilities, there will be a considerable increase in pre-school enrolment. Taking the average figures for Switzerland as a whole, the «Convergence II» scenario anticipates a 12% increase in the number of pre-school students between 2007 and 2013. After that point, the FSO estimates that the number of pre-school students will remain steady until 2017. With the exception of the Cantons of Geneva, Vaud, Zug and Zurich, the number of primary school students is expected to decrease in the period between 2007 and 2017. While, in most cases, the decrease is likely to be less than 10%, the predictions for the Cantons of Appenzell-Ausserrhoden, Glarus and Uri estimate a decline of between 15% and 20%.

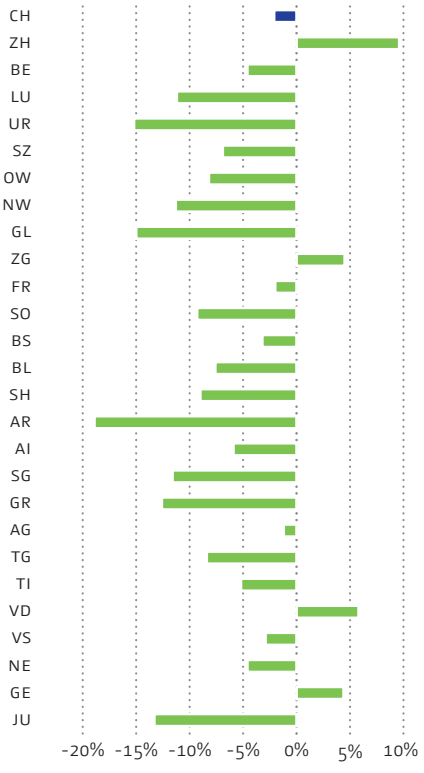
30 **Change in the number of students attending pre-school, 2007–2017**

Data: FSO



31 **Change in the number of students attending primary school, 2007–2017**

Data: FSO



Institutions

This sub-section outlines institutional aspects of the pre-school and primary school level of education. The aspects discussed include courses and objectives, associated conditions such as teaching time, class sizes, student-teacher ratios, two major development projects that have an impact at the structural level (first learning cycle, foreign language learning), improving students' language skills as a core task in terms of educational impact, and transitions between different levels. The information provided is based on the Swiss education server as well as on the Annual Cantonal Survey conducted by the EDK's Information and Documentation Service, taking the 2008/2009 academic year as the reference date.

32 **Number of students by type of school, 2007/08**

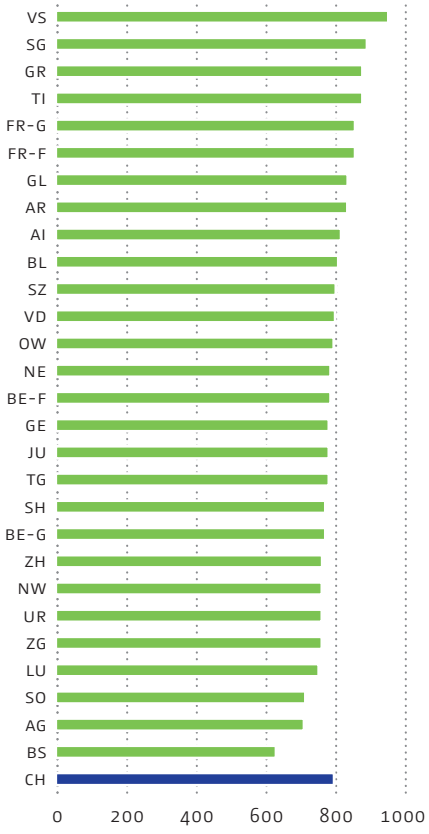
Pre-school (Pre), Primary school (Prim)

Data: FSO

Type	Pre	Prim
Public	136,785	431,610
Private, subsidised	689	966
Private, not subsidised	14,225	12,560

33 **Average annual number of teaching hours in primary education, 2008/2009**

Data: EDK/IDES



Types of institution, participants, objectives

In Switzerland, primary school education is preceded by pre-school education lasting at least one year (→ *Chapter Compulsory education, page* 53, → Figure 21). Most pre-school providers are obliged to offer a two-year pre-school period. The Canton of Ticino provides three-year pre-school facilities. Four cantons, i.e. Basel-Stadt, St. Gallen, Thurgau and Zurich, have made two-year pre-schooling compulsory as of the 2008/2009 academic year. A further ten cantons require children to attend a pre-school facility for one year. In those cantons that provide for a two-year pre-school education (whether this be voluntary or otherwise), between 78% and 100% of children are enrolled in pre-school facilities. On average, children in Switzerland attend pre-school for a period of 1.9 years.

In 20 cantons, primary school education lasts for six years, while in four Cantons (Aargau, Basel-Landschaft, Ticino and Neuchâtel), it lasts for five years and, in two cantons (Basel-Stadt and Vaud), four years. One of the purposes of the Intercantonal Agreement on Harmonisation of Compulsory Education (HarmoS Agreement) was to ensure that primary school education lasts for a total of eight years in all parts of Switzerland.

While most children attend public institutions, 10% of children attend private schools at the pre-school level and 3% at the primary school level (→ Table 32). Each canton has its own separate curricula for pre-school and primary school education, which the private schools are also obliged to follow.

Pre-school supports the development of children on the basis of their individual level of development and needs. It prepares them for the transition to school and promotes self-reliance as well as cognitive, personal and social skills. Primary school supports children in the development of their intellectual, creative, physical and artistic abilities. It also develops their sense of responsibility towards themselves, the environment, their fellow human-beings and society as a whole.

The HarmoS Agreement has laid down the overarching objectives of compulsory education for the very first time, and these objectives will be implemented in the curricula at all levels of compulsory education within the individual linguistic regions of Switzerland. For certain subjects, the educational standards set out in the HarmoS Agreement are intended as the minimum standard to be achieved.

In most cantons, pre-school and primary school children with special educational needs are either taught in small special needs classes or are taught alongside other children but receive special support. For pre-school education, this latter approach is adopted more frequently. Learning objectives and requirements are derived from the curricula, but are tailored to the individual abilities of the children involved. Special attention is paid to the development of basic cognitive skills as well as competences promoting self-reliance and social integration.

Teaching time, class sizes and student-teacher ratio

The number of school weeks per year, the duration of lessons and the number of lessons taught per week vary considerably between the individual cantons. This, in turn, gives rise to major differences in the average number of teaching hours delivered each year (→ Figure 33).

The low figures for the Cantons of Basel-Stadt and Aargau can be partially explained by the fact that the average is calculated on the basis of only four or five years of primary school and that fewer lessons are taught each week in the first couple of years of primary school education than in the latter years. Indicators compiled by the OECD and in the *Lehrplan 21* project conducted in the German-speaking part of Switzerland can be used to draw up a comparison of the percentage weighting and tuition hours per specialist subject in the German-speaking region of Switzerland and a number of neighbouring countries for children aged 9 to 11/12. This analysis is based on the average annual numbers of hours taught to children aged 9 to 11/12. This particular comparison shows that Swiss primary schools spend relatively little time teaching the school's language of instruction; this is offset to some extent through the additional time spent teaching foreign languages (→ Table 34).

34 **Distribution of teaching time across individual subject areas in German-speaking Switzerland and in neighbouring countries**

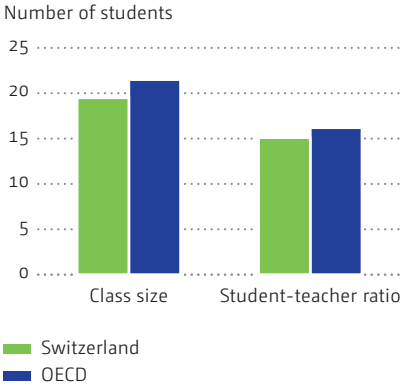
Data: Lehrplan 21, OECD

	Distribution by per cent				Distribution by hours			
Subject area	**D-CH**	**A**	**D**	**F**	**D-CH**	**A**	**D**	**F**
School's language of instruction	17	24	20	31	145	184	156	268
Foreign languages	14	8	10	10	120	61	78	89
Mathematics	17	16	18	18	145	122	141	159
Sciences, social sciences, humanities	20	21	21	18	171	161	164	159
Art	20	18	15	11	171	138	117	97
Physical education	10	10	11	13	85	77	86	115
Miscellaneous / Other / Rounding errors	2	3	5		17	23	40	
Total	**100**	**100**	**100**	**100**	**855**	**767**	**782**	**887**

The average class size at primary school level varies from canton to canton, ranging from 17 to 21 students per class. The average class size for Switzerland as a whole is 19 students. There are somewhat bigger differences in the student-teacher ratios. The number of students per full-time equivalent teacher is between 13 and 18. In Switzerland as a whole, the average student-teacher ratio at primary school level is 15 students per full-time equivalent teacher. Both class sizes and student-teacher ratios have hardly fluctuated over time in Switzerland. As an international comparison, both figures are slightly below the OECD average (→ Figure 35).

35 **Class sizes and student-teacher ratio, Switzerland and OECD countries, 2007**

Data: OECD



Pilot classes for a new concept for the first learning cycle

In the cantons of Western Switzerland and Ticino, the pre-school level is closer to the primary school levels in terms of concept than is the case in the German-speaking region of Switzerland, where pre-school maintains a

culture of its own and where the transition into primary school sometimes disrupts the continuity of education. The possibility of keeping children due to enter primary school in pre-school or placing them in special needs classes has given rise to a situation where the transition from pre-school to primary school has become relatively selective. In many cases, this means that children experience failure at the very start of their school-based education. Discussions have thus been underway for some time on the restructuring of this transition *(EDK, 1997; EDK, 2006a)*. Since 2002, the cantons of the German-speaking region of Switzerland and the Principality of Liechtenstein have been working together on a project entitled «Education and learning in pre-school and the first years of primary school in the context of the EDK's eastern division and partner cantons». The aim of this project is to develop a new concept for the first learning cycle and to test two models: one model comprising two years of pre-school and the first two years of primary school and another model comprising two years of pre-school and the first year of primary school. In the pilot classes, children are taught in mixed-age groups with a gradual transition from learning through play to systematic learning. Team teaching is being implemented in these pilot classes, with teams made up of multi-professional teachers. The pre-school and primary school cultures are then merged in this way, and children with special needs can be integrated in the class. The main objective of these two transitional models is to safeguard the continuity of education and enable every child to progress on the basis of his/her stage of development and learning. The transition from pre-school to primary school is to be kept flexible. The project has been designed so as to ensure the development of a common set of educational principles for the first learning cycle (regardless of which model is used). The project also includes a broad-based evaluation *(→ Effectiveness, page 75)*.

The early teaching of foreign languages

The purpose of foreign-language teaching is to enable students to become **functionally multilingual**. The **methodology** used in the teaching of foreign languages is an **integrative** one, which also incorporates the students' mother tongue. Particular attention should also be paid to the **mother tongue of those students with a migration background**. Another approach that is increasingly being adopted is what is known as CLIL, or content and language-integrated learning.

Foreign-language teaching plays an important role in a multilingual country like Switzerland, and the cantons would like to tap the potential for the early learning of foreign languages more effectively. Both a second national language and English must be taught from the primary school level onwards. As part of their 2004 decision regarding the teaching of foreign languages, the cantons have agreed that foreign language teaching should commence no later than the start of Year 3 (Year 5, under the nomenclature introduced with the HarmoS Agreement) and that a second foreign language should be introduced from Year 5 onwards (the new Year 7). The sequence in which individual languages are taught will be coordinated on a regional basis.

- In Central Switzerland, the Cantons of Uri, Schwyz, Obwalden, Nidwalden, Zug (since 2004/5) and Lucerne (since 2007/8) have introduced English from Year 3 onwards, while retaining the teaching of French from Year 5 onwards. In the Canton of Uri, Italian is an elective subject from Year 5 onwards, while French is taught from Year 7 onwards.
- Since the 2006/7 academic year, schools in the Canton of Zurich have been teaching English from Year 2 onwards, while retaining the teaching of French from Year 5 onwards.
- Starting in the 2008/9 academic year, the Eastern Swiss Cantons of Ap-

penzell-Ausserrhoden, Glarus, Schaffhausen and St. Gallen introduced English from the third year of primary school, while the Canton of Thurgau is following suit in 2009/10. All of these cantons have retained the teaching of French from Year 5 onwards. In the Canton of Appenzell-Innerrhoden, English has been taught from Year 3 of primary school since 2001/2, while French has been put back to Year 7. In the Canton of Graubünden, the first foreign language is one of the three cantonal languages and is to be taught from Year 3 onwards (as of 2010/1). English will then be taught from Year 5 onwards (provisionally from 2012/3 onwards).
- In the Canton of Aargau, English has been taught from Year 3 since the 2008/9 academic year, while French is to be brought forward from year 6 to Year 5 as a result of the structural reforms that are taking place.
- The Cantons of Basel-Stadt, Basel-Landschaft and Solothurn have entered into a cooperation agreement with the German-speaking areas of the Cantons of Bern, Fribourg and Valais. While children in the Cantons of Fribourg and Valais have been learning French from Year 3 onwards for some time now, this will apply to all the cantons involved starting with the 2011/2 academic year. The teaching of English from Year 5 onwards is to be introduced as of the 2013/4 academic year.
- In the cantons of Western Switzerland, German has been taught from Year 3 onwards for many years and between now and the 2012/3 academic year, the teaching of English is to be brought forward to Year 5.
- In the Canton of Ticino, foreign-language teaching has been organised as follows, on a staggered basis, since 2004/5: French (Years 3 to 7), German (Years 7 to 9) and English (Years 8 to 9).

Improving student language skills as a core task of education

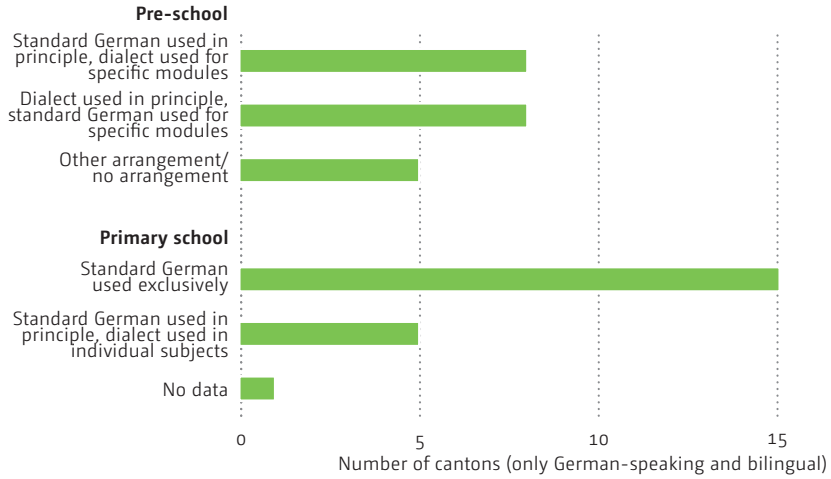
Since the publication of the PISA 2000 reading literacy results, promoting language skills has been high on the political educational agenda. Measures to improve language skills have been implemented in both pre-school and primary school. As far as pre-school is concerned, *Bertschi Kaufmann, Gyger, Käser et al. (2006)* established that the following measures are deployed:

- programmes to promote phonological awareness
- programmes combining linguistic and cognitive skills
- approaches that enable students to have access to written language at an early stage
- measures to promote knowledge and skills of the first language
- coordination of pre-school and out-of-school facilities
- the use of standard German in pre-school.

As far as the primary school sector is concerned, the cantons have implemented measures based on the post-PISA 2000 action plan which are being evaluated by the EDK in 2010. Due to the diglossia situation in the German-speaking region of Switzerland, where the Swiss German used in everyday life differs substantially from the standard German taught in school, the issue has been raised as to which language (Swiss German or standard German) should be used to teach classroom subjects. The cantons have adopted various commensurate resolutions in this regard (→ Figure 36).

36 **Languages used in the classroom, German-speaking Switzerland, 2008/09**

Data: EDK/IDES



Traditionally, special language courses have been provided for children who are native speakers of a foreign language. These courses are provided in addition to the main classroom teaching. The conditions governing entitlement to such courses differ, however, with between 2 and 12 lessons per week being provided over a period of one or two years. At primary school level, certain cantons provide intensive courses or integration classes for new-arrivals and organise specific support to be provided alongside mainstream class teaching. This ranges from one lesson per week for a period of one year to 10 lessons per week for two years.

Transitions between pre-school, primary school education and lower-secondary education

At the transition from one stage of education to the next, teachers generally involve the parents as well as the students themselves in the decision-making process. The criteria applied upon entry into primary school (which only involves a transition from pre-school in cantons where attendance at pre-school is compulsory) are the age of the child and/or their development status.

The progression of each student from one year to another is determined on the basis of academic achievement in all subjects or in specific subjects. Performance in the various subjects is described in progress reports or is expressed in the form of a grade. In the event of insufficient performance, students can be required to take specific support measures, repeat a year or transfer to a special needs class.

For the transition from primary to lower-secondary education, assessment criteria include academic achievement in differently defined subjects, the amount of effort put in or, in some cases, the results of orientation tests or transition examinations. In cantons where lower-secondary education is based on performance-based grouping, the main objective is to assign students to the performance-based group that matches their anticipated level of ability.

Effectiveness

This section examines the effectiveness of the pre-school and primary school levels, based on a variety of inputs. Does pre-school attendance have an impact on subsequent academic achievement? Does the configuration of the first learning cycle affect learning? Are curricular objectives being achieved? Is the introduction of foreign-language teaching at an earlier stage proving successful? Do specific special needs courses achieve what they set out to do? Are transition decisions being taken in the correct professional manner?

The long-term effects of attending pre-school

The PISA Assessment conducted in 2003 provided the last indication as to the long-term effects of attending pre-school. Young people who stated that they had attended pre-school for a year or longer achieved higher levels of proficiency in mathematics than young people who had not taken part in pre-school education *(OECD, 2004)*. These findings correspond with those of a study conducted in Germany, which showed that students who had attended pre-school were considerably more likely to be assigned to a middle or high performance-based group in lower-secondary education than those who had never attended a pre-school. The study also shows, however, that, for children from educationally disadvantaged backgrounds, even all-day attendance at a pre-school could not entirely compensate for the lack of stimulation at home *(Landvoigt, Muehler & Pfeiffer, 2007)*.

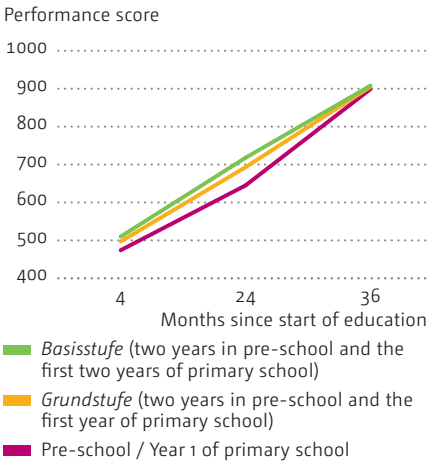
Performance development during the pre-school level

Within the framework of the project on «Education and learning in pre-school and the first years of primary school» already mentioned above, an assessment was conducted of two alternative models designed to ease the transition from pre-school to primary school: the four-year model (i.e. two years of pre-school and two years of primary school) and the three-year model (i.e. two years of pre-school and the first year of primary school). The performance of children in the four-year and the three-year pilot classes was compared with that of children in control pre-school and primary school classes conducted along traditional lines. As far as can be ascertained on the basis of the interim reports released in 2008, the experimental models turned out to be a success. While a considerable number of the children from the control group were assigned to preparatory classes prior to enrolment in primary school or to special needs classes in primary school, the children from the pilot classes did not require any segregated measures *(Vogt, Zumwald & Urech, 2008)*. This means that the seamless transition aimed at had been achieved. In addition to a high degree of satisfaction among all those involved in all three models, the evaluations revealed the different effects that each model had on the educational progress of the children (→ Figures 37, 38 and 39).

In all areas of learning, the children in the pilot classes made either the same or more advanced progress than their counterparts in the control group at pre-school over the first two years. In the third year, the children from the

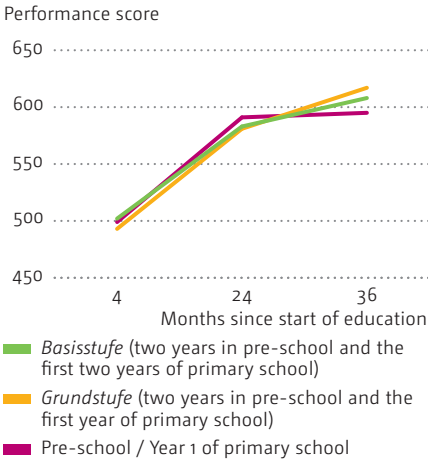
37 **Learning progress in reading by school type, 2004–2007**

Data: *Moser, Bayer & Berweger, 2008*



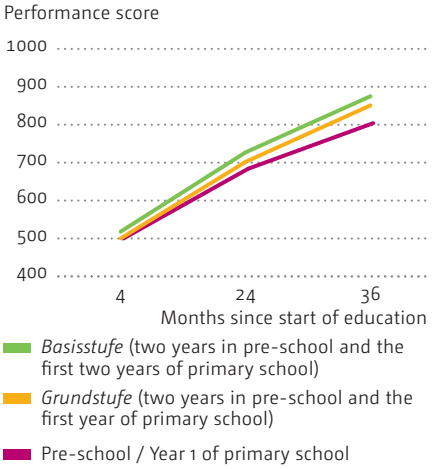
38 **Learning progress in vocabulary by school type, 2004–2007**

Data: *Moser, Bayer & Berweger, 2008*



39 **Learning progress in mathematics by school type, 2004–2007**

Data: *Moser, Bayer & Berweger, 2008*



control groups caught up with the other children in terms of their reading and writing aptitudes. In areas such as vocabulary and overall cognitive skills, as well as mathematics, children in the pilot classes performed much better. No differences were observed in social and emotional skills. In the various curriculum areas, between 64% and 90% of the children achieved skills at the highest levels tested *(Moser, Bayer & Berweger, 2008)*.

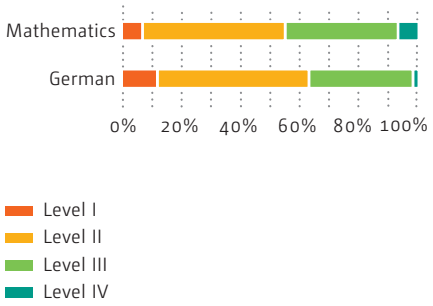
Achievement of curricular objectives

Switzerland does not measure competencies at pre-school and primary level in the same way as the PISA measurements at secondary level, since Switzerland has not so far participated in the corresponding international studies, such as PIRLS. Comparable data for the whole of Switzerland on the outcome of teaching and learning processes in the primary school sector will probably only become available when the attainment of objectives is verified in conjunction with the HarmoS educational standards. Selective assessments of learning outcomes are performed in individual cantons or within individual programmes. A number of cantons also undertake canton-wide comparative tests but the results of these are for internal use only and are not released into the public domain.

On the basis of a longitudinal study conducted in the Canton of Zurich to determine the skills of students during the entire period of compulsory education, it was established that, at the end of Year 3, 88% of the children had achieved the set curricular objectives in German and 93% in mathematics *(Moser & Hollenweger, 2008)*. Those 12% of children whose test scores were only at Level 1 in German and the 7% of children whose test scores were at only Level 1 in mathematics had certainly made learning progress since entering school, but did not attain the objectives specified in the curriculum (⟶ Figure 40).

40 **Level of achievement in Year 3 in the Canton of Zurich: Proportion of students by level, 2006**

Data: *Moser & Hollenweger, 2008*



In the Check 5 test, which teachers in the Canton of Aargau can have their pupils take at the start of Year 5, all the children who took the test in the 2008/2009 academic year reached the set curricular objectives in German, while 5% failed to do so in mathematics *(Keller & Moser, 2008)*.

In the Canton of Geneva, the success rate in the canton-wide tests in French in Year 2 of primary school was approximately 89%, while in Year 6 of primary school, it was around 88% *(Petrucci & Nidegger, 2008)*.

The figures for these tests are not mutually comparable, since their reference framework and access to the tests were different. Both tests, however, reveal that the linguistic and socio-economic background of the test takers had a significant impact on performance levels. While in the Cantons of Zurich and Geneva, class composition had a demonstrable effect on performance, this was not observed in the Canton of Aargau.

Evaluations of foreign-language teaching in primary school

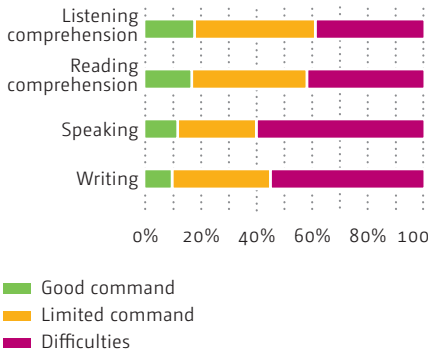
A number of cantons now provide foreign language teaching as of Year 3 of primary school, in accordance with the EDK's concept for languages. In the German-speaking region of Switzerland, the results of the first set of evaluations are now available *(Bader & Schaer, 2005; Haenni Hoti, 2007; Husfeldt & Bader Lehmann, 2009)*. These reveal a consistently high level of acceptance

and motivation among both teachers and students. According to these evaluations, children are reaching the set curricular objectives. The studies, however, also mention the unresolved problem of different performance levels, which create considerable challenges for foreign language teachers, with the result that a number of children are either overworked or underchallenged.

It is the French-speaking cantons, including the Canton of Geneva, which have the most extensive experience in providing foreign-language teaching from an early age. In these cantons, a test was conducted to determine whether the EDK's foreign language objectives, which are modelled on the Common European Framework of Reference for Languages (CEFR), were being achieved *(Schwob, 2008)*. Although 84% of students had attained the curricular objectives in German as a foreign language by the end of primary school, the curriculum is not (yet) based on the CEFR. Two additional tests were conducted on the basis of future learning objectives (level A1 under the CEFR). These tests revealed that only 74% and 72% of students respectively achieved the required objective. According to estimates provided by the teachers interviewed, one of the pre-requisites that would enable the objectives to be reached by 2010 would be to improve the foreign language skills of the teachers themselves. According to their self-assessment, almost 40% of teachers encounter difficulties in achieving the minimum level required to teach a language to others – level B2 under the CEFR (→ Figure 41).

41 **Self-assessment in German, primary-school teachers, Geneva, 2007**

Data: *Schwob, 2008*



Several expert reports have been drawn up on one highly contentious issue within educational policy circles, namely whether students at primary school level are able to cope with learning two foreign languages. These reports show that students can indeed cope with this but that specific attention needs to be paid to less able students, to differentiation, to the need to tailor the curriculum to the students' age and to the children's previous experiences, as well as to the need to ensure that teachers are adequately trained *(Brohy, 2002; Stern, 2002; Elmiger, 2006)*.

Empirical results from school-based experiments involving early bilingual education are also available. These show that the teaching of foreign languages by immersion works, has no negative impact on the students' skills in the language spoken within the school and does not undermine factual knowledge *(Brohy, 2004; Schwob & Ducrey, 2006)*. In Central Switzerland, where a longitudinal study is being conducted on the effectiveness of foreign language teaching in primary schools, it was shown that the introduction of English language teaching in the third year of primary school does not seem to have had any negative consequences on the development of children's reading comprehension skills in German, not even among multilingual children with a migration background or among less able children *(Haenni Hoti & Werlen, 2007)*.

The effectiveness of programmes to improve student language skills

Only a very small number of empirical studies have been conducted into the effectiveness of programmes to improve students' language skills at pre-school and primary school level. The positive effects of programmes on phonetic awareness, spelling, grammar and reading comprehension are well documented, both among children whose native language is the same as the language spoken within the school as well as among children with a

different first language. In the case of this latter group, however, promoting phonetic awareness is not sufficient, and additional measures such as vocabulary enrichment and grammar are also needed.

Linguistic and cognitive improvement programmes must be based on the results of carefully conducted language skill assessments and tailored to the results of these; they must similarly make allowance for the needs of children who are acquiring the language spoken within the school for the first time. Early access to the written language (storytelling activities, familiarisation with letters and handwriting) is suitable for children growing up in homes with few books or for children who are native speakers of a foreign language. In the latter case, the promotion of the first language as part of a continuous teaching programme that coordinates learning in both languages has a positive effect. The consistent use of standard German in the classroom is highly beneficial, especially for children with little knowledge of the language spoken within the school *(Bertschi-Kaufmann, Gyger, Käser et al., 2006; Landert, 2007)*. In addition to promoting language skills and introducing students to written language at the pre-school level, children also need to be given the opportunity not only to acquire knowledge of the language spoken in the school *(Neumann, 2008)*, but also to develop basic and complex literacy skills *(Isler & Künzli, 2008)*.

Enrolment in preparatory classes, repeating a year

A large number of cantons make provision for children who are suffering from delayed development or learning problems prior to school entry to attend preparatory classes (Year 1 class extended to two years). A study involving children from various cantons has shown that, although transfers to a preparatory class can be justified in the case of a variety of developmental delays, the children are unable to make up for their learning deficit. The researchers therefore recommend that the additional time could be used to better effect by providing these children with targeted support *(Michel & Roebers, 2008)*.

Another measure that is sometimes used to deal with learning difficulties encountered by children is having them repeat a year. The effectiveness of this is also doubtful, with short-term positive effects set against a declining positive or even negative impact on learning development and school paths. After just one year, the initial improvement in performance has returned to a level comparable with that before the student repeated a year. A possible alternative approach to this problem would be to provide targeted support to students, either in addition to their repeating a class or to accompany their automatic progression to the next class *(Bless, Schüpbach & Bonvin, 2004; Daeppen, 2007)*.

Entry into school and the transition from primary to lower-secondary education

The transition from one level of education to the next can be regarded as a critical event in the life of an individual child, especially within a separative school system, and it is necessary to check whether they can cope with this. This has been done within the context of the Swiss Youth Survey *(Schultheis,*

Perrig-Chiello & Egger, 2008), for example. When questioned, those responsible for the children stated that just over half of all children coped well or very well with the transition from pre-school to primary school education, around one-third coped moderately well, and one-seventh found the transition difficult. The criteria upon which these statements were based included adaptation to everyday routine at school, the development of relationships with teachers and becoming accustomed to homework. Individual attributes of the children themselves (conscientiousness and prior educational knowledge), social capital based on family background (older siblings, close emotional style of upbringing) and experience in learning contexts outside of the family and outside of school (such as nurseries, sports tuition) also favoured a successful transition to school life *(Kriesi, Scherrer & Buchmann, 2008)*.

In terms of effectiveness, it is important to ensure that children are not allocated incorrectly during the transition. The PISA assessments have, however, shown that transition decisions based on the opinions of teachers (and parents' preferences) provide imprecise forecasts of academic achievement in lower-secondary education. Again and again, they reveal considerable overlaps in terms of skills across performance-based groups in lower-secondary education *(→ Chapter Lower-secondary education, page 89)*.

The influence of socio-economic and cultural background on the transition from primary school to lower-secondary education has been well-documented in Switzerland *(Coradi Vellacott & Wolter, 2005a; SCCRE, 2006)*. Considerably less research has been conducted, however, into the structural factors that affect the transition process or on the effects of the transition itself. Various studies have pointed to the fact that transition-related opportunities and risks vary on the basis of the canton in question and the structure of the lower secondary education level, plus the method employed for the transition itself *(Kronig, 2007; Baeriswyl, Wandeler, Trautwein et al., 2006)* *(→ Equity, page 82)*.

Efficiency/Costs

In order to estimate the efficiency of the use of resources in pre-school and primary school education, the first step involves establishing how best to measure the effectiveness of these two levels. Relevant data must also be available. Even if comparable data relating to academic achievement (output) were available, which is not the case *(→ Effectiveness, page 75)*, these data alone would not suffice, because academic achievement is only one of the effects of education processes. Other aspects, such as personality development, socialisation and personal cultivation would then not be taken into account. An additional problem relates to the fact that the input is difficult to capture (e.g. teacher qualifications and experience, or the quality of curricula). Moreover, the available information on resource allocation is of a broader nature and cannot therefore be used to determine individual effects.

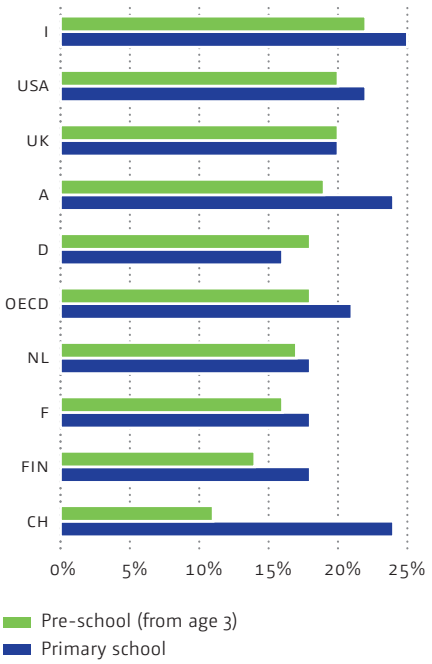
Keeping in mind international studies on the benefit of investing in the early years of education, we first present the costs of pre-school and primary school education and then compare these costs at both international and intercantonal level. We then attempt to ascertain the reasons for the differences observed. Finally, the efficiency of a number of measures is examined.

The benefit of investing in the early years of education

At international level, it has often been pointed out over the past few years that investing in the early years of education is certainly worthwhile. After comparing studies conducted in the United States, for instance, *Temple and Reynolds (2007)* conclude that pre-school education has a very favourable cost-benefit ratio, not least when compared to other measures, such as reducing class sizes, having students repeat a year or introducing occupational integration measures. *Wössmann (2008a)* reaches the same conclusion for Europe, even though this is based on less clear-cut evidence due to fewer studies being available. On the basis of recommendations made by the European Expert Network on Economics of Education (EENEE), the European Commission has called for greater investments to be made in the early years of education *(European Commission, 2006b)*.

42 **Annual educational expenditure per student in relation to per capita GDP, 2006**

Data: OECD



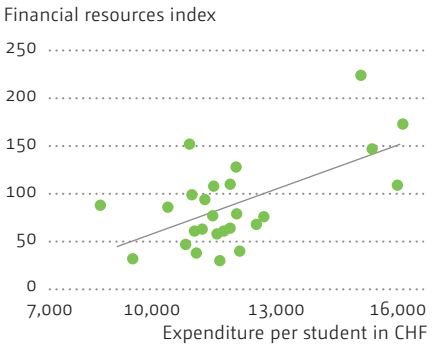
Expenditure on pre-school and primary school education – an international and an intercantonal comparison

An international comparison based on the OECD indicators shows that, in contrast to expenditure for the tertiary A sector, Switzerland devotes little funding to the pre-school sector and above-average funding to the primary school sector (further details regarding the tertiary A sector → *Chapter Universities, page 185*). With regard to these data (→ Figure 42) it should also be pointed out that the OECD data include children as young as three in the pre-school sector. In most Swiss cantons, however, state-run pre-school facilities are only open to children from the age of 4 or 5. In addition, the data for Switzerland only include public expenditure; private expenditure has not been included, and this amounts to approximately 10% of the total amount spent on pre-school education *(→ Institutions, page 69)*. Moreover, the amount of expenditure does not provide any indication of the effectiveness and efficiency of this expenditure.

Both in Switzerland and in other countries, educational expenditure per student in the primary school sector is higher than that in the pre-school sector. However, the difference is greatest in Switzerland, by a large margin. The lack of data mentioned earlier may explain part of this difference.

43 **Ratio of educational expenditure (primary school) and financial resources, by canton, 2005**

Data: FSO

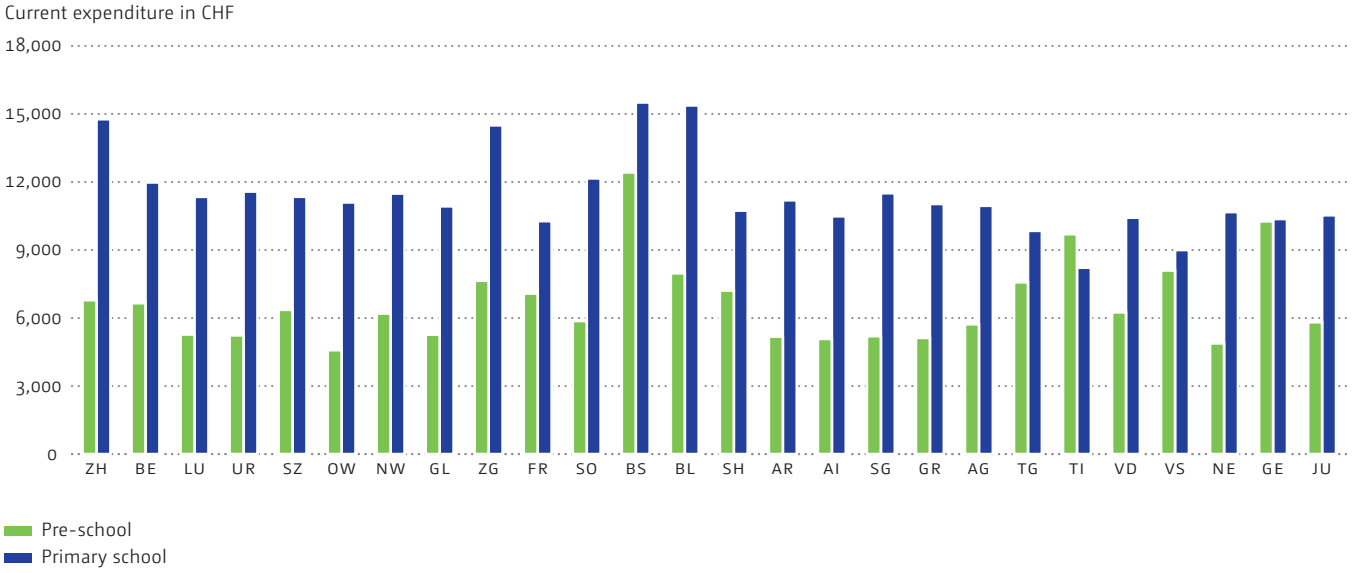


36% of the variation in per capita expenditure relates to the different financial resources of cantons.

The Swiss Federal Statistical Office publishes figures on annual public expenditure on education (current expenditure, without investments) per student, broken down by level of education as well as by canton (→ Figure 44). The above-mentioned differences in expenditure per student for pre-school and primary school can probably be explained in part by differences in the salary and the age structure of teachers. The considerable differences in expenditure between the individual cantons can also be partly explained by differences in salary levels, since personnel costs account for a substantial proportion of expenditure. These differences, in turn, can be justified in part by the dissimilar cost of living. An indication of this can be found in the positive correlation between the financial resources of the cantons and their expenditure on education (→ Figure 43). Finally, part of the difference can be attributed to differences in the way the expenditure has been recorded.

44 **Public expenditure on education per student, by level of education and canton, 2005**

Data: FSO

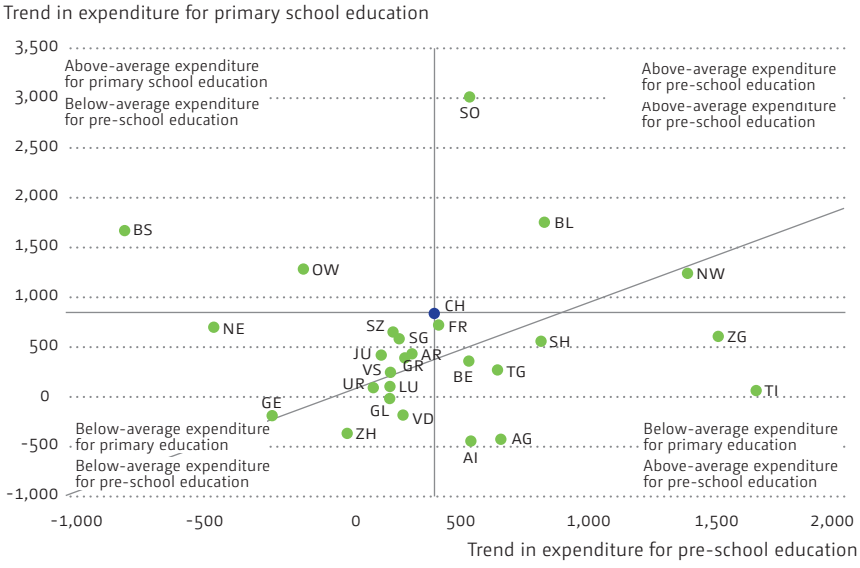


Trends in public expenditure on pre-school and primary school education

Over the past few years, public expenditure per student has increased in most Swiss cantons. A comparison of pre-school sector expenditure between 2003 and 2005 with primary school sector expenditure shows the weighting in expenditure development at each level of education (→ Figure 45). Increases in expenditure are no doubt due to general inflation, on the one hand, and declining student numbers *(Schläpfer, 2009)* or the expansion of

45 **Trend in the ratio of expenditure per student, for pre-school and primary school education, in CHF, 2003–2005**

Data: FSO



special education classes, on the other hand. In most cantons, the increase in expenditure is moderate and a few cantons are even spending less on education than before. The average figure for Switzerland set out in Figure 45 is affected by a number of outliers. The line of equivalence compares the increase in pre-school sector expenditure in Swiss francs to the increase in primary school sector expenditure. The number of cantons that allocated larger sums to the pre-school sector than to the primary school sector is approximately equivalent to the number of cantons that did the opposite.

The efficiency of special needs measures

In discussions regarding whether to provide special needs education within mainstream classes or create separate classes/schools, the question also arises as to which approach is more cost-effective. At present, no publicly accessible comparative studies have been conducted in Switzerland. *Preuss-Lausitz (2002)* estimated that, in the context of the German education system, including children with special needs in mainstream classes was not more expensive but actually more cost-effective than sending them to special needs schools. Previous studies conducted in Switzerland came to the same conclusions *(Zutter, 1990)*.

Delaying student progression through compulsory education, such as holding students back from entry to primary school, allocating students to a preparatory class or requiring students to repeat a year, has been called into question, since the effectiveness of such measures has been judged to be negative *(→ Effectiveness, page 75)*. And even if a measure actually brings about the desired effect, the efficiency of that measure is reduced by the delay in the student's educational path *(Tresch & Zubler, 2009)*.

It is thought that combining structural measures such as longer cycles (e.g. a three-year or four-year first learning cycle) with individually-determined deadlines for completion will lead to fewer delays in a child's progression through compulsory education, but this assumption has not yet been confirmed. A study on this particular issue in the Canton of Vaud and the evaluation of the first learning cycle pilot classes have shown that education institutions are much more willing to slow down a child's educational progress than accelerate it *(Ricciardi Joos, 2007; Vogt, Zumwald, Urech et al., 2008)*.

Equity

Equity in pre-school and primary school education can be determined on the basis of whether children have access to education, develop adequate skills and are able to progress through compulsory education, irrespective of their gender or family background. In addition to family background (social and migration status) and gender, we also need to consider other aspects relating to the social context of schools or the school structure in the different cantons as possible factors influencing the educational opportunities afforded to each individual.

Access to education

National and international studies have shown that educational and day-care facilities for very young children provide a number of benefits, especially for disadvantaged children, but only if the educational or day-care facility in question is of high quality and is attended for a certain period of time *(OECD, 2006b; EDK, 2006a) (→ Effectiveness, page 75)*. Since there is a notable lack of such facilities for children between the ages of 0 to 4 in Switzerland and, despite state subsidies, parents end up paying relatively high fees, it has to be assumed that socially disadvantaged children have only limited access to education and day-care facilities in their early years. This has been confirmed by an older study on the academic achievement of children with a migration background *(Lanfranchi, 2002)* and the Zurich learning status study upon entry into the first years of primary school *(Moser, Stamm & Hollenweger, 2005)*. In addition, facilities for young children in Switzerland focus more on day-care and less on (compensatory) learning *(EKFF, 2008; EKM, 2009; Stamm, Reinwand, Burger et al., 2009)*. Even the early years of education provided within the realm of special education hardly focus at all on social risks *(Burgener Woeffray & Eisner-Binkert, 2006)*. This means that children who are brought up in a socially difficult environment, with very little encouragement to learn, will only be given limited support on an institutional level. It is therefore hardly surprising that, at the start of their educational path (first learning cycle, pre-school), there are already considerable differences in skills to the detriment of children with a low socio-economic status *(→ Context, page 66)*.

Even where pre-school attendance is voluntary, high participation rates show that the accessibility of pre-school is high. Very little is known, however, about precisely which children are not attending pre-school *(Moser, Stamm & Hollenweger, 2005)*. It is conceivable that, given the lack of day-care facilities, parents in full-time employment find individual solutions to their day-care problem and therefore do not send their children to pre-school. In cantons and communities that do not provide multi-year pre-school facilities, long-term attendance is denied to all those who depend upon (free) state-run facilities.

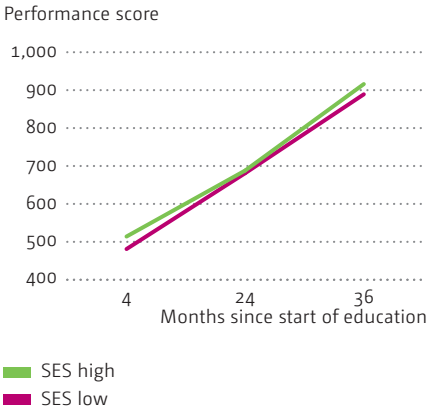
The provision in the HarmoS Agreement for compulsory attendance of pre-school in the same way as for primary school, coupled with quality assurance in these fields, guarantees that all children will have access to educational institutions of a comparably high quality.

Skills development

In order to be able to examine skills development independently of family background and gender, we would first need to have data that chart the learning progress of students and permits a statement to be made on learning growth after controlling for entry-level abilities. Data of this type are largely unavailable in Switzerland, however. One exception is the assessment of school-based experiments involving a new concept for the first learning cycle (EDK eastern division's project «Education and learning in pre-school and the first years of primary school», *→ Institutions, page 69*). In that assessment, the performance of around 900 children was tested upon entry into the first learning cycle or pre-school (control group). Their per-

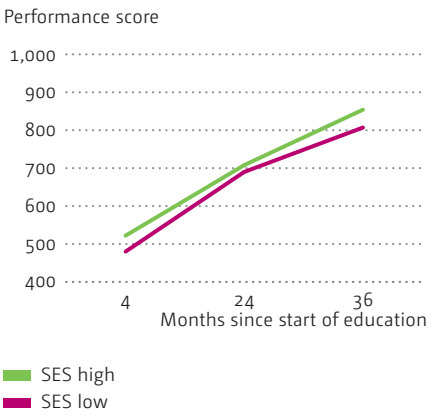
46 **Learning progress in reading (first learning cycle), by social origin, 2004–2007**

Data: *Moser, Bayer & Berweger, 2008*



47 **Learning progress in mathematics (first learning cycle), by social origin, 2004–2007**

Data: *Moser, Bayer & Berweger, 2008*



formance was tested again 20 months later and 12 months after that *(Moser, Bayer & Berweger, 2008)*. The study showed that in reading and mathematics, children from a privileged background displayed a higher degree of prior learning in the entry-level test. The test conducted 20 months later showed that learning progress was very similar (reading) or differed only slightly (mathematics) for all the children. Finally, the test conducted 12 months later showed that disadvantaged children had, at best, made only minimal headway towards recovering lost ground (→ Figures 46 and 47).

Analysing the data on the basis of the students' knowledge of the language of instruction, children who are native speakers of a foreign language are seen to make up for the disadvantage that affected them at entry level by making more substantial progress as learners. Girls come to school with better reading skills than boys and also make better progress. As far as mathematics is concerned, girls and boys commence their education with similar levels of skills but boys make better progress in the third year of education.

Another longitudinal study focussed on skills development in primary schools in the Canton of Zurich. Student skills upon admission to primary school were recorded in 2003 *(Moser, Stamm & Hollenweger, 2005)* and then tested again three years later. The test results showed that children from a disadvantaged background started their first year of primary school education with a lower level of pre-existing skills, progressed less rapidly in their learning and were unable to make up for lost ground (→ Figures 48 and 49).

Children for whom German was their second language displayed a somewhat slower rate of progress in reading and were still slightly behind after three years of primary school education. In mathematics, however, there were no differences. If we examine the data on the basis of gender, there were no differences in the first year in terms of reading. Girls, however, made more significant progress and performed better in the third year of primary school education. In mathematics, boys were ahead of the girls at the start of their schooling, but girls made faster progress and almost succeeded in catching up with the boys *(Moser & Hollenweger, 2008)*.

The performance measurements conducted among Year 5 students in the Canton of Aargau revealed a difference in performance in subjects such as German and mathematics in favour of children from privileged backgrounds and children whose first language was German. The scores achieved by boys in mathematics and by girls in reading were also higher *(Keller & Moser, 2008)*.

An assessment of mathematics skills in Years 2 and 4 in French-speaking cantons and regions of other cantons revealed differences in performance that correlated with socio-cultural background and the language spoken at home. The researchers conducting the study pointed to the cumulative disadvantage that resulted from a low social status, foreign origin and speaking a foreign language *(Guignard & Tièche Christinat, 2007)*.

The assessment of cantonal tests conducted in Year 6 of primary school in the Canton of Geneva also points to the fact that lower social class and/or a foreign language spoken at home can have a negative effect on academic achievement. The issue of gender was not taken into account here *(Petrucci & Nidegger, 2008)*.

In the studies conducted in Zurich and Geneva, the social composition of classes also played a role, while in the Canton of Aargau, no influence of this type was observed.

Educational paths

The transition from pre-school to primary school forms the first hurdle where not only the stage of childhood development and aptitudes but also other attributes may have an influence upon a child's educational path. Keeping a child in pre-school, sending a child to a preparatory class or placing a child in a special needs class in primary school are initial interventions that will prevent a child from following a normal educational path. A study of an entire cohort in the Canton of Aargau revealed that 10% of children did not start primary school at the normal age: 1% started school earlier, while 9% started school later. Of the children admitted to primary school at the correct age, 12% had attended a preparatory class. Of the children admitted at a later age, 7% had attended a preparatory class, a measure that actually introduced a double delay into the child's progression through compulsory education. The differences between boys and girls as well as between German-speaking children and children with a different first language were minimal in this regard *(Tresch & Zubler, 2009)*. A study conducted in the Canton of Zurich identified similar proportions of children admitted to school at a later age, but also provided evidence that boys were at greater risk in this regard than girls *(Moser, Keller & Tresch, 2003)*.

Even during a child's subsequent educational path, allocation to special needs classes or the requirement to repeat a year are decisions that affect a child's progression through compulsory education. Such measures should therefore be carefully considered so as not to undermine equity in students' chances later on. The study in Aargau revealed that, over the course of their primary school education, one in three children who are native speakers of a foreign language, compared to only one in five children of Swiss origin require a longer time to complete primary school than the time officially specified *(Tresch & Zubler, 2009)*. Since this study did not make allowance for individual characteristics such as cognitive ability, it is not possible to confirm whether the problem was indeed one of a lack of equity.

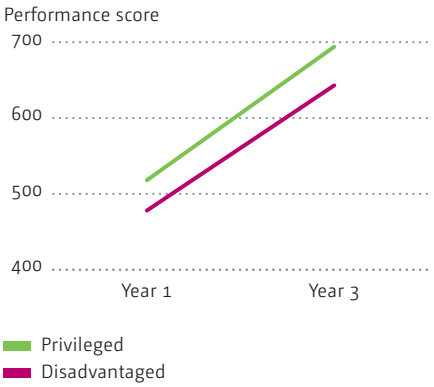
On a very general level, however, the above-average proportion of students of non-Swiss origin attending special needs classes and the constant steep increase recorded in this proportion over the last two decades of the 20th century still raises a number of questions (→ Figure 50). We also need to carefully examine the different rates at which children of non-Swiss origin are allocated to special needs classes in individual Swiss cantons (→ Figure 51).

It is recognised that the range of available special needs facilities at pre-school and primary school levels has an impact on assigning children to these facilities and hence that children with the same attributes run a greater risk of being singled out in certain cantons than they do in others *(Kronig, 2007)*. It has also been possible to prove that assignment practices differ even at the level of individual communities *(Sieber, 2006)*. Children with a migration background and low socio-economic status are thereby more likely to be assigned to a special needs class *(Lanfranchi, 2007)*.

As far as repeating a year is concerned, a study has shown that in the French-speaking region, children with a migration background are more often required to repeat a year than other children of similar aptitude and potential. One of the reasons for this is thought to be the absence of alternative facilities to support children who are native speakers of a foreign language *(Bless, Schüpbach & Bonvin, 2004)*.

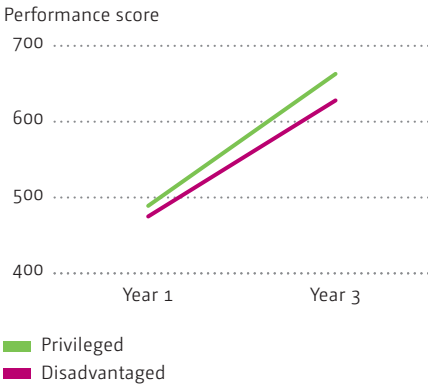
48 **Learning progress in reading (Years 1–3), by social origin, 2003–2006**

Data: *Moser & Hollenweger, 2008*



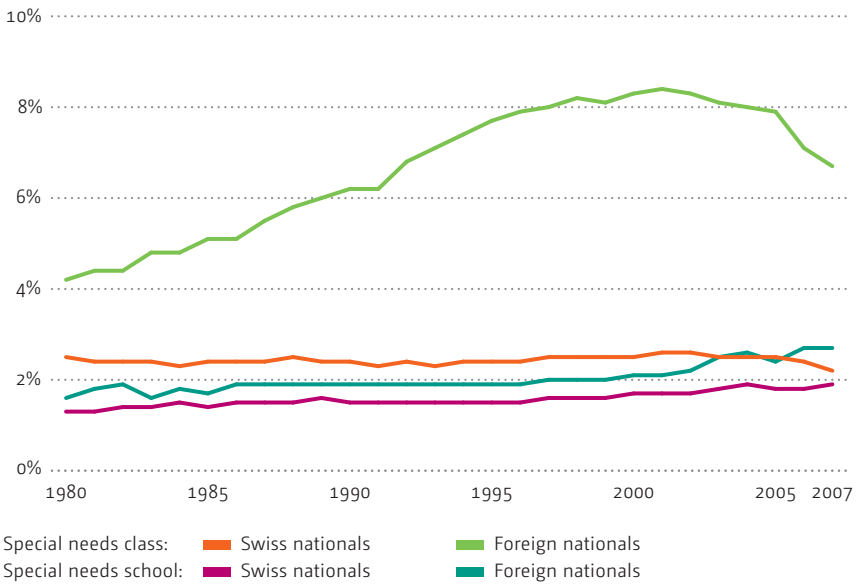
49 **Learning progress in mathematics (Years 1–3), by social origin, 2003–2006**

Data: *Moser & Hollenweger, 2008*



50 **Proportion of students in special needs classes and schools, by migration status, 1980–2007**

Data: FSO

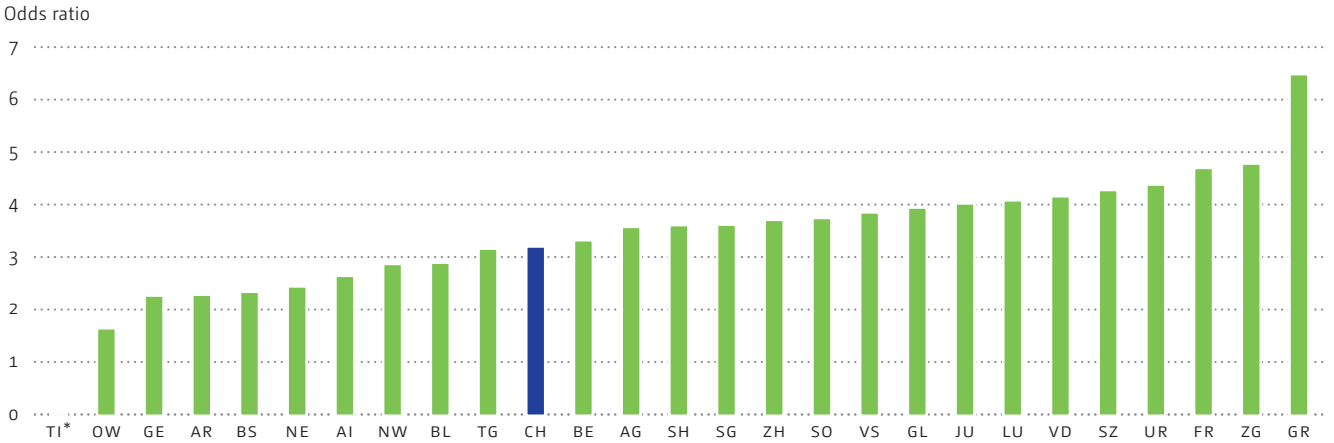


As far as equity is concerned, the transition from primary school to lower-secondary education marks a significant step. The selection process that takes place at the end of primary school has considerable repercussions. Overlapping academic achievement in different performance-based groups indicates that the decision to assign students to specific groups is not taken solely on the basis of academic achievement in primary school *(PISA Research Community in Switzerland's German-speaking region / Principality of Liechtenstein, 2008)*.

As a rule, objective (academic achievement) data from primary school are used to only a limited extent when initially assigning students to specific performance-based groups at lower-secondary level, even though the basic

51 **Likelihood that children with a migration background will be allocated to special needs classes, compared to Swiss children, by canton, 2007/2008**

Data: FSO



* The Canton of Ticino does not operate any special needs classes.

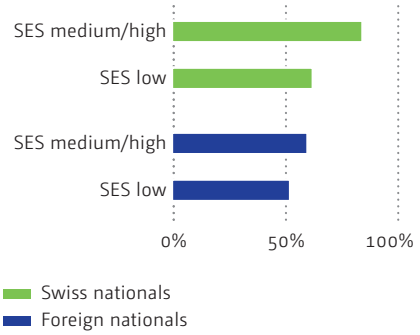
principle applied is that the selection and assignment of students to specific performance-based groups should be determined purely on the basis of student aptitudes. For one thing, performance-based grouping at the start of lower-secondary level is preceded by many years of student assessment reports by primary school teachers, which may have been subject to distortions based on the origin or gender of the student as well as on peer group effects. *Trautwein and Baeriswyl (2007)* were able to show that, during performance-based group selection at the start of lower-secondary school, students with equal test results in above-average-achieving primary school classes were judged to be performing less well than students with the same test results in below-average-achieving primary school classes. In addition, the selection process for lower-secondary school also takes in not only student assessment reports and predictions by the teachers but also the wishes of parents and children, thus offering scope for possible distortions based on origin or gender *(Ditton & Krüsken, 2006; Baeriswyl, Wandeler, Trautwein et al., 2006; Paulus & Blossfeld, 2007; Maaz, Neumann, Trautwein et al., 2008)*.

Kronig (2007) successfully demonstrated that students of average ability who come from privileged families and are of Swiss origin are more often assigned to a high-ability group at lower-secondary level than students with the same level of academic achievement who have a migration background or who come from underprivileged families (→ Figure 52).

Earlier selection and a larger number of differentiated follow-on performance-based school types puts less-privileged students at a disadvantage *(Hanushek & Wössmann, 2005; Bauer & Riphahn, 2006; Wössmann, 2007)*. This represents a major problem for equality of opportunities, since the school type attended at lower-secondary level has a decisive impact on a student's future educational opportunities at post-compulsory level *(Bertschy, Cattaneo & Wolter, 2009)*.

52 **Likelihood that students (of average ability) will transfer to a more demanding type of school, by social origin, 2001**

Data: *Kronig, 2007*

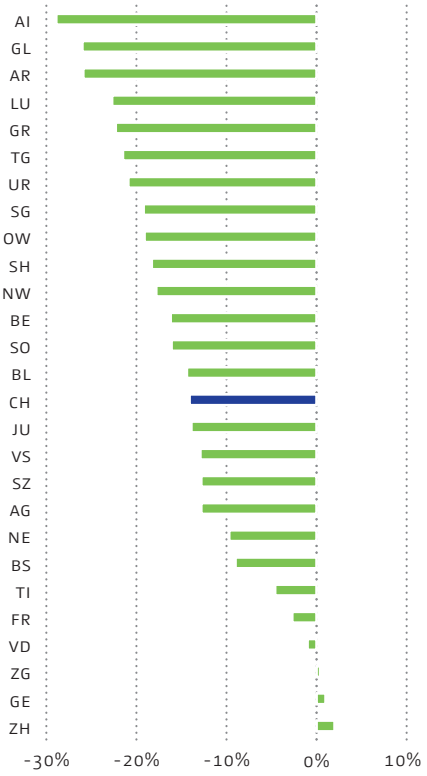


Lower-secondary education

Context

53 **Predicted trend in student numbers in lower-secondary education, 2007–2017**

Data: FSO



Over the next few years, lower-secondary education will be affected considerably by demographic changes in Switzerland. By 2017, the number of students in compulsory schooling is set to fall by approximately 14% throughout Switzerland with a decline of at least 12% in student numbers in lower-secondary education (→ Figure 53). There will, however, be considerable differences from one canton to another, with seven rural cantons in the German-speaking region experiencing a decline of over 20%, and Zurich, Geneva and Zug seeing a small increase in numbers. Within the cantons themselves, individual regions and municipalities will additionally be affected to a different extent by the fall in numbers. A good many schools located in remote locations will see an above-average fall in numbers compared to the average for the canton as a whole. This trend is not expected to be reversed at secondary school level until after 2017, when the increase in numbers forecast for the primary school level as of 2013 makes itself felt (an increase of around 3% by 2017; *FSO, 2008b*). This increase will in no way make up for the decline that will have taken place in the interim. The drop in the number of students is more than a mere cyclical fluctuation. As a result of the demographic shift, student numbers are set to stabilise at a lower level.

Demographic effects

The primary effect of the demographic changes is likely to be that class sizes will be reduced in lower-secondary education. Only after this will classes or schools be amalgamated or have to be closed down altogether. This means that financial and personnel resources will only be freed up at a subsequent point in time.

It still remains to be seen whether these resources will be saved, redistributed within the education system or transferred from the education sector to other public sectors (this last-mentioned option being prompted by an ageing population and the political influence of senior citizens) *(Grob & Wolter, 2007)*.

The education authorities in the individual cantons have been aware of the demographic changes for quite some time. A number of cantons are already planning and preparing appropriate measures that will enable them to effectively handle the decline in student numbers. Schools in rural locations will face the largest declines, with student numbers dropping by one-fifth to a quarter by comparison with the peak figures. Since running small and very small schools incurs considerable expenditure in terms of infrastructure, many schools may actually have to be shut down. In other words, merging classes or reducing class sizes will not be sufficient to enable those schools to continue to operate. The decline in student numbers will also pose major challenges for the streamed model at lower-secondary level. In the lower-secondary education sector, it is common for children to be assigned to different ability classes, and this makes it more difficult for classes to be merged. Structural changes would include lower-secondary schools based on a combination of ability grouping and level grouping (cooperative model) or on a combination of mixed-ability groups and level grouping (integrated model)

As far as the **merging of schools** is concerned, fears have been expressed that anonymity and a lack of cohesion and respect have become more widespread in large schools and that this then leads to social problems and a loss of individual responsibility. Most of the studies in this area were conducted in English-speaking countries and all concluded that smaller schools encounter fewer social problems and achieve better results. These studies can only be transposed to the situation in Switzerland to a limited extent, since Swiss schools rarely have more than 500 students. Based on the criteria set out in the above-mentioned studies, most schools in Switzerland would fall into the small school category *(Leithwood & Jantzi, 2009)*.

(→*Institutions, page 92*). Another alternative would be mixed-age classes. Any of these options would enable a school to be kept in operation. A survey conducted among a number of cantons revealed that, for a number of smaller cantons (Appenzell Ausserrhoden, Nidwalden, Obwalden, Thurgau and Uri), these measures have already been fully or partially implemented. In the Canton of St. Gallen, a discussion regarding the reform of the education system in response to the demographic changes began in 2008 . The discussions are also addressing issues relating to teaching and learning in an effort to ensure that no schools will have to be shut down.

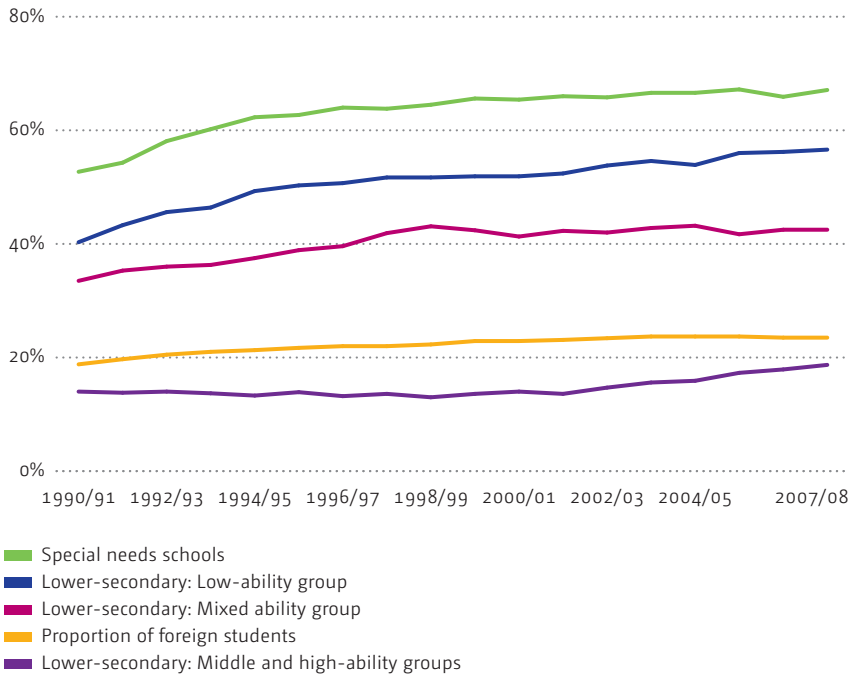
The organisational and structural changes that will be needed will generally be accompanied by measures taken within individual schools in order to attempt to respond to the fluctuating and, in most cases, falling student numbers by introducing measures of an educational, teaching and curriculum-related nature. Such measures include mixed-ability grouping, forms of cooperation between teaching staff, such as team-teaching, and also mixed-aged learning and mixed-ability class groups. It is hoped that if all these measures are implemented, it will be possible to run an entire secondary school with as few as 20 students. Nevertheless, options such as reducing the number of school sites or shifting responsibility for running schools from the municipality to the canton will still need to be discussed.

Increase in the number of heterogeneous classes

Within the lower-secondary education sector, the total number of very heterogeneous classes is unequally distributed across the different types of schools (→ Figure 54). Over half of all low-ability classes in Switzerland since 1996/7 have been very heterogeneous. In contrast, fewer than 20% of

54 **Proportion of very heterogeneous classes and foreign students, 1990/1–2007/8**

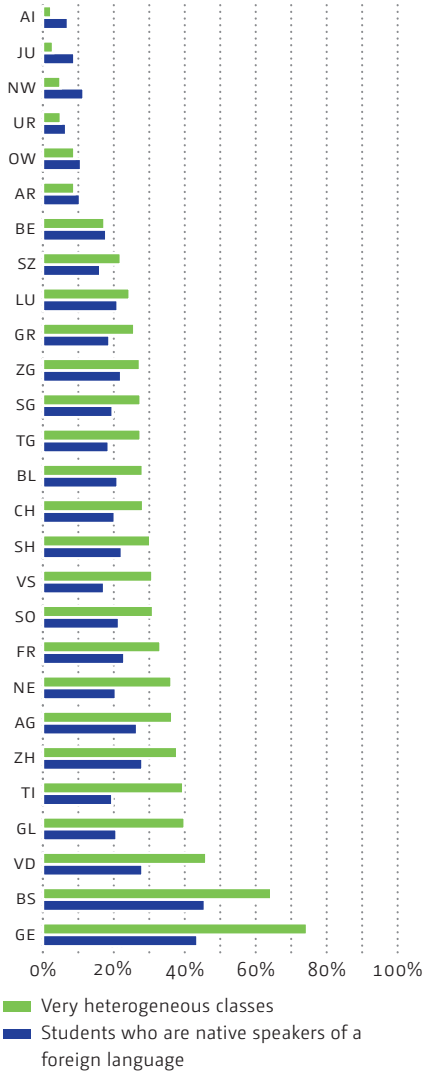
Data: FSO



The Federal Statistical Office defines as **«very heterogeneous classes»** those in which at least 30% of students come from a different culture (based on national and linguistic origin).

55 **The proportion of very heterogeneous classes and proportion of students who are native speakers of a foreign language, by canton, 2007/8**

Data: FSO



medium and high-ability classes have been very heterogeneous. The steady increase, of around 50%, in very heterogeneous classes cannot be attributed exclusively to a rise in the number of foreign students, since this figure has only risen by 25% over the period in question. This suggests that the concentration of foreign residents in certain urban districts and agglomerations has continued to rise, and that it is hence increasing social segregation that has led to the increase in highly heterogeneous classes (→ *Chapter Pre-school and primary school education, page 65*).

The increasing number of heterogeneous classes also masks a change in the countries of origin of foreign students. Over the past 15 years, the number of young people from the traditional EU immigration countries (Italy, Spain, Greece) has fallen by half, while the proportion of students speaking other languages from Southern Europe (including Turkey) and from other, predominantly Asian and African, countries has doubled.

The very heterogeneous composition of classes currently represents one of the most significant educational, methodological and social challenges that schools are required to deal with. Classes comprised of students with different home cultures and native languages require differentiated and individualised tuition. The schools in question also require specific support and additional specialist resources and funding. One example of this is the «Quality in Multicultural Schools» (QUIMS) project in the Canton of Zurich, in which resources have been allocated to 73 individual schools. The schools are selected on the basis of a multicultural index, which determines the proportion of foreign students. In order to qualify for QUIMS funding, schools need to have a multicultural index in excess of 40%. A further measure employed to allow for heterogeneity is the differentiated allocation of resources to schools, including the social index-based allocation of resources (→ *Chapter Compulsory education, page 53*). What has proven relatively unsuitable is sending such students to different types of school based on their performance, the problem being that with lower-secondary schools the resulting homogeneous classes tend to be short-lived and do not remain homogeneous for long *(Haefeli, Schräder-Naef & Häfeli, 1979; Moser & Rhyn, 1999)*.

Institutions

The objectives of lower-secondary education are to continue the students' basic education and provide them with the skills needed for lifelong learning *(EDK, 1995b)*. Lower-secondary education is also intended to prepare students for upper-secondary education, whether this is in the general education or the vocational education and training (VET) sector.

In most cantons, lower-secondary education starts at Year 7 and generally lasts for three years (as envisaged in the HarmoS Agreement). Students coming out of compulsory education (currently after 9 years of school attendance) who do not immediately enrol in upper-secondary education have the option of bridge-year courses for Year 10 (→ *Chapter Upper-secondary education, page 111*). This has the effect of extending lower-secondary education by up to one additional year.

Structural diversity with a gradual move towards cooperative or integrated models

In Switzerland, there are still many different types of lower-secondary school in the various cantons and even within individual cantons. If we attempt to classify these according to a uniform set of criteria, then the various types of lower-secondary school fall into one of the three models shown below (→ Table 56):

- The integrated model is based on a system of non-selective classes. Students are all placed in the same mixed-ability group and then sent to different level groups for various subjects on the basis of individual aptitudes.
- The cooperative model combines ability grouping with level grouping. Students are placed in two separate ability groups and are then sent to different level groups for foreign languages, mathematics and possibly a third subject on the basis of individual aptitudes.
- The streamed model is based purely on ability grouping. Students are separated into two, three or four ability groups and sent to entirely different schools with different teaching staff, curricula, teaching materials and range of subjects offered.

56 **Ability/level grouping models used at lower-secondary level in 26 cantons, 2009**
Data: IDES and Network Lower-secondary education

Cantons that use only one model		Total 11
Integrated model	JU, TI	2
Cooperative model	ZG (plus Year 7 to 9 Baccalaureate schools)	1
Streamed model: bipartite *	SG	1
Streamed model: tripartite *	AG, BL, NE, FR, SO ***, VD	6
Streamed model: quadripartite *	GL	1
**Cantons that use more than one model ** **		Total 15
Integrated and cooperative model	AR, NW (NW plus Year 7 to 9 Baccalaureate schools), TG	3
Streamed and cooperative model	GR (tripartite), SZ, SH (bipartite), ZH (quadripartite)	4
Streamed and integrated model	AI (quadripartite), BS (tripartite), GE, VS (bipartite)	4
Integrated, cooperative and streamed model	BE (bi- or tripartite), LU, OW, UR (tripartite)	4

* When gathering information regarding the three models used in each canton, all of the lower-secondary schools *(Untergymnasium, Bezirksschule, Sekundarschule, Weiterbildungsschule, Realschule, Oberschule)* were considered except special needs schools. In the cantons of Basel-Stadt, Neuchâtel and Vaud, where lower-secondary education lasts four or five years, ability grouping of students does not take place until after the first, second or third school years.
** The canton leaves it up to local school administrators to decide which model to use at a given school. In most cantons (albeit only a slight majority), it is the streamed model that prevails over the two hybrid forms: i.e. ability grouping plus level grouping for each subject (cooperative model) and no ability grouping plus level grouping for each subject (integrated model). In five cantons (Bern, Graubünden, Obwalden, Uri and Valais), the cooperative model (or the integrated model) predominates.
*** Due to a not yet implemented structural reform approved by referendum in 2006, Solothurn switched from a quadripartite to a tripartite streamed model starting from the 2009/10 academic year.

The streamed model can be found in all cantons, except for five (Appenzell Ausserrhoden, Jura, Nidwalden, Thurgau and Ticino). Over the past few years, however, the cooperative model and integrated model have es-

tablished themselves in an increasing number of cantons as alternatives to the streamed model. The definitive introduction of these models was preceded by a long pilot phase and an educational policy debate of varied intensity (Appenzell Ausserrhoden, Bern, Nidwalden, Obwalden, Thurgau and Zurich). In 2009, only 8 cantons still used the streamed model exclusively, compared to the 12 cantons that were using it exclusively in 2006. This matches a trend that the OECD has observed for quite some time now, moving away from a pure ability grouping and separation of students in lower-secondary education *(OECD, 2007a)*.

Regardless of which model is used, the allocation of students to specific types of school and different level groups does not enable us to predict academic achievement with any real degree of accuracy, especially among students assigned to middle-ability groups *(Moser & Rhyn, 1999; Schuchart & Weishaupt, 2004)*. Additional samples were taken in several cantons within the context of the PISA assessment in 2006, providing yet further evidence of the fact that overlaps in aptitudes in the three PISA subject areas are relatively broad: some of the students from the lowest level A in the Canton of Basel-Landschaft scored over 600 points on the PISA assessment. This means that they scored better than over half of the students from the highest level P *(Moser & Angelone, 2008)*. While overlaps of this type cannot entirely be avoided, we must nevertheless assume that an excessive overlap will result in students either finding themselves overstretched or underchallenged. Overlaps are also entirely at odds with the educational policy assumption that the streamed model will create more homogeneous classes of students who all share similar aptitudes and are therefore easier to teach. If ability grouping is not based exclusively on objective criteria, however, the benefits of sending students to entirely separate schools will be undermined. What is more, the possible gains from such a model will also give rise to negative effects in terms of equity. This would be the case, for instance, if upper-secondary schools or even the job market (VET sector) based their decisions to admit, allocate and promote students on the basis of which ability group these students were assigned to in lower-secondary school.

One of the decisive attributes of lower-secondary education is its flexibility over time, in other words the ability of the model to respond to changes or re-evaluations of achievement or potential achievement. The Canton of Zurich examined the question as to which of the three structural models (streamed, integrated or cooperative) provides for a greater degree of flexibility. To determine this, researchers considered the realignment of levels that took place between 1999 and 2004. The results of this study showed that, on a quantitative level, the cooperative model provided a greater degree of flexibility. In other words, it is more adaptable, since it provides for greater flexibility in the corrective reallocation of students and actually puts this flexibility into practice. With the cooperative model, most adjustments that take place involve putting students up a year, whereas with the streamed model, keeping students down a year occurs more frequently *(Zurich, 2003)*.

New arrangement for Year 9

Almost all the cantons in the German-speaking region of Switzerland are in the process of planning, testing or introducing a new arrangement for Year 9, i.e. the year that precedes the transition from lower to upper-secondary education. These projects are all roughly the same and pursue very similar objectives but carry different titles. They seek to provide more individualised, goal-oriented learning in Year 9 to prepare students more adequately for upper-secondary education (apprenticeship, specialised school). They also seek to make a more effective use of Year 9, which is the last year of compulsory education.

Taking, for example, the Canton of Zurich, which was the first canton to enter the implementation phase and has introduced the new arrangement for the 2010/11 school year, it can be seen that orientation actually starts in Year 8. The first step involves having students take an assessment test to determine their current state of knowledge and skills (the *Stellwerk* test in most cases). This assessment test is then followed by a discussion with parents and students. Both of these instruments are used to devise and implement a targeted programme that will develop the student's subject-specific skills on the basis of his/her chosen occupation or education. By Year 9, to ensure the more individualised advancement of students, their interdisciplinary competences will be furthered through project work and a final piece of written work. An additional objective is to achieve more binding and uniform rules for the preparatory work leading to the student's choice of occupation. Part of this includes closer and earlier cooperation between the family, the school, occupational guidance counsellors and employers. The new arrangement requires a number of different adaptations and innovations, which also affect the Year 9 curriculum and timetable.

Practical experience gained in the pilot schools in Zurich and in a similar project in Aargau was evaluated to determine the effectiveness and usefulness of the new arrangement. The experiences and opinions of those involved in the pilot schools in Zurich were surveyed in order to establish the impact and benefit of the different elements of the new arrangement. In general, it was established that the new arrangement in Zurich was easy to implement, which was reflected, not least, in a high level of acceptance. The *Abschlusszertifikat* project in Aargau also met with the acceptance of most of those questioned.

Distribution of available teaching time between subjects

On the basis of OECD indicators and a planning forecast established during the *Lehrplan 21* project in the German-speaking region of Switzerland, it is now possible to compare the percentage weighting per subject in the German-speaking region with corresponding percentages in a number of neighbouring countries (→ Figure 57). In the case of lower-secondary education, we find that Switzerland has achieved identical or almost identical percentages to those of its neighbouring countries which had the relevant data available. The only areas in which striking differences were observed were in art and physical education.

57 **Percentage distribution of teaching time across subject areas for 12- to 14-year-olds, 2006**

Data: Lehrplan 21 (Internet), OECD

	Percentage distribution			
Subject area	Switzerland: German speaking region	Austria	Germany	France
School's language of instruction	15	13	14	16
Foreign languages	15	11	12	12
Mathematics	15	15	14	15
Natural sciences, social sciences, humanities	26	25	22	26
Art	17	16	10	7
Physical education	5	10	9	11
Other	7	9	12	6

In all of the countries included in the comparative study, the lower secondary school's language of instruction was allocated about the same percentage of teaching time, while, in Swiss primary schools, the school's language of instruction received by far the lowest percentage of teaching time (→ *Chapter Pre-school and primary school education, page 65*). At both levels, the amount of time devoted to foreign languages is highest in Switzerland, at between 3% and 6% higher than in neighbouring countries.

Differences in the annual number of teaching hours

While the international comparison shows differences in the percentage of teaching time devoted to individual subjects, it does not provide any indication of the annual number of teaching hours devoted to a given subject. If we examine the annual number of teaching hours in Switzerland, we find substantial differences between individual cantons. While the consequences of these differences on a student's learning have not yet been fully clarified, these differences are nevertheless so great that, when added up across the entire duration of lower-secondary education, they can amount to the equivalent of almost an entire school year (→ Figure 58).

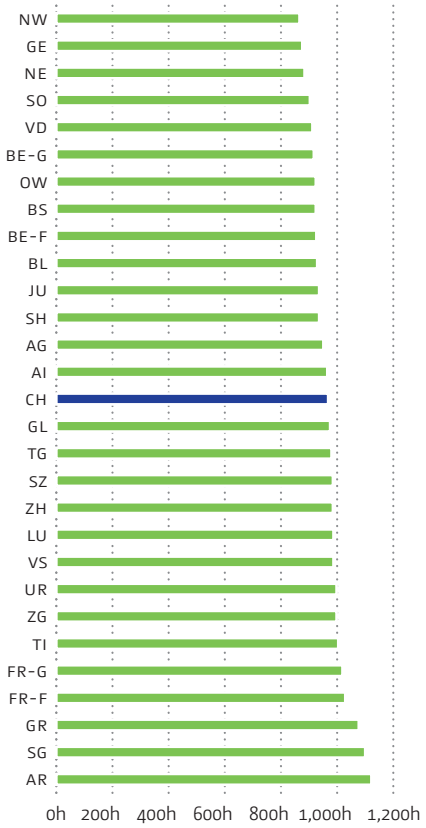
The maximum difference of around 250 teaching hours per year over the 3 to 5 school years of lower-secondary education is considerable. Comparing the Canton of St. Gallen (1,100 hours) with the Canton of Solothurn (903 hours), the annual difference is just under 200 hours, for example. Roughly half of this is due to the fact that lessons in the Canton of St. Gallen are five minutes longer than those in the Canton of Solothurn (50 minutes compared to 45). A further 66 hours of the difference can be explained by the fact that Solothurn only has 38 weeks of school as opposed to St. Gallen's 40. Six out of seven cantons with 50-minute lesson slots thus feature among the six

The **annual number of teaching hours** is determined by multiplying the duration of the lesson (45 or 50 minutes) by the average number of lessons per week (between 30 and 35 lessons) and then by the number of school weeks per year (between 36.5 and 40 weeks).

cantons with the highest annual number of teaching hours. If we leave lesson duration (50 or 45 minutes) out of the equation, two of those six cantons are still in the top six places. The other four would have ranked between tenth and twenty-second.

In general, no information is available on the number of hours devoted to individual subjects in each Swiss canton. Only for mathematics – and only for the mandatory lessons there – have reliable data been compiled on the number of teaching hours over the nine-year period of compulsory education *(EDK/IDES, 2006)*. The total number of hours spent teaching mathematics during the entire period of compulsory education in most cantons was just under 1200 (in the German-speaking areas of the Canton of Bern and the Canton of Basel-Stadt) or slightly over 1500 (in the Cantons of Appenzell Innerrhoden, Glarus and Ticino). In addition to this, further differences were observed between the different types of lower-secondary school located within the individual cantons. These differences were such that, in the case of lower-secondary schools operating at the lower end of the ability range, a larger number of hours were taught, while in lower-secondary schools operating at the higher end of the ability range, a smaller number of hours of were taught. Despite the compensatory measure of devoting a larger number of teaching hours to mathematics, students in low-ability groups still have generally lower mathematics skills than students in high-ability groups. The greatest difference in the number of teaching hours in the different lower-secondary school types within an individual canton is approximately 200 hours of mathematics (in the Canton of Glarus). The Cantons of Bern, Basel-Stadt, Schaffhausen and Thurgau provided the same number of hours regardless of the ability groups in question.

58 **Average annual number of teaching hours at lower-secondary level, 2007/8**
Data: IDES

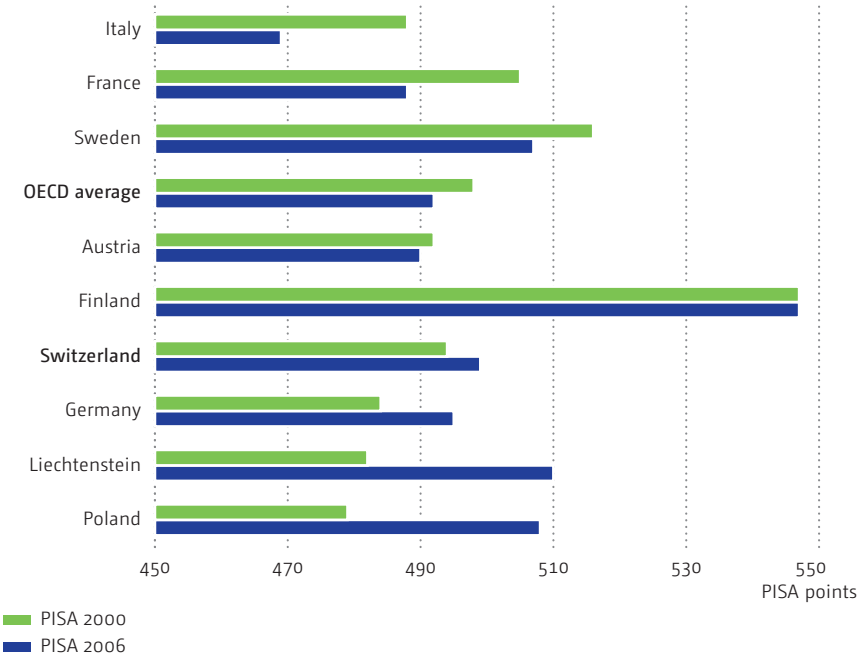


Effectiveness

The effectiveness of lower-secondary education can be determined on the basis of various criteria. The educational objectives set out in the curriculum of the canton concerned are doubtless the most important criteria, since these objectives ought to have been achieved by the time a student completes his/her compulsory education.

In addition to the subjects that form the core curriculum, such as mathematics, mother tongue and first foreign language, these objectives also include the development of general aptitudes such as problem-solving or political awareness. This means that the effectiveness or the achievement of objectives in lower-secondary education also needs to be assessed on the basis of multiple targets in the case of output objectives. Furthermore, a successful transition from lower to upper-secondary level (whether to the general education or the VET sector) is another criterion used to determine the effectiveness of lower-secondary education. Medium and long-term outcomes, such as future unemployment, future tertiary-level qualifications and others, should also be taken into account. These outcomes cannot be assessed as effectively, however, due to a lack of long-term data regarding individual students and, in some cases, they cannot be directly attributed to academic achievement during lower-secondary education (→ *Chapter Cumulative effects, page 269*).

59 **International comparison of PISA reading literacy results, 2000 and 2006**
Data: OECD



The PISA project enables academic achievement to be compared on an intercantonal and international level and, to a certain extent, also permits a comparison of academic achievement over time. In the PISA assessment conducted in 2006, the reading literacy of 15-year-olds in Switzerland was found to be just above the OECD average for the first time *(FSO/EDK, 2007)*. This result was partly due to the fact that Switzerland increased its average score by five points and partly due to the fact that the OECD average actually went down by six points (→ Figure 59). It is important to note, however, that the increase in the average score achieved by Switzerland (and also Austria or Germany) between the two PISA 2000 and 2006 assessments is statistically insignificant. The increases in the scores achieved by Liechtenstein (+28 points) and Poland (+29 points) are highly significant, however, together with the drop in the scores achieved by France (–17 points) and Italy (–19 points) *(OECD, 2007c)*.[1] The comparisons are based on average scores in each case, with the performance of 15-year-olds in 2000 being compared with the performance of 15-year-olds in 2006. The PISA data do not illustrate individual learning progress achieved over the course of a student's education. PISA studies are therefore only of limited usefulness in answering questions regarding the effectiveness of specific measures within the realm of classroom teaching.

1 A detailed overview of student scores in science, mathematics and reading can be found in the international PISA study for 2006 *(OECD, 2007g, h)*, as well as in Switzerland's national report on the same topic *(FSO/EDK, 2007)*.

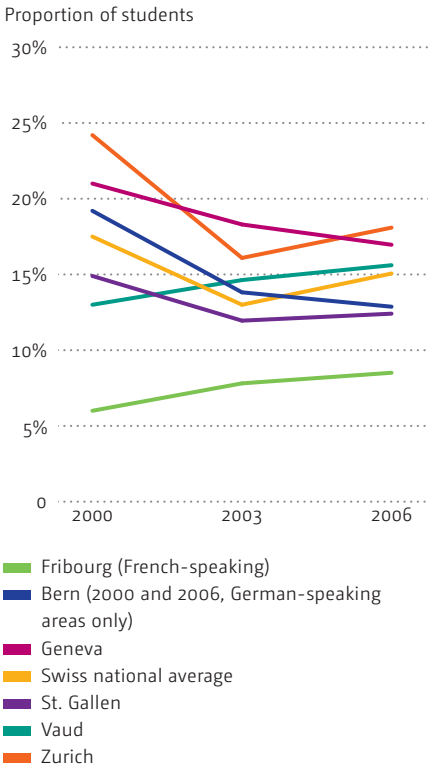
The five benchmarks of the EU

The EU adopted five benchmarks for general and vocational education in the context of the Lisbon objectives established in 2003 (→ *Chapter Definitions, page 23*). One of those benchmarks relates directly to lower-secondary education and the reading skills of 15-year-olds. The proportion of 15-year-olds with poor reading skills is to be reduced by at least 20% in 2010 in comparison with the proportion in 2000 *(European Union, 2003)*. Poor reading performance in PISA tests is a reading literacy of level 1 or lower. Switzerland has only partially achieved this objective and still needs to reduce its proportion by 1% (→ Figure 60). National averages, however, partly mask significant regional differences, and Switzerland is no exception. What is striking in this regard is that the cantons with a relatively high proportion of students at the lowest reading skill levels in 2000 (Bern, Geneva, Zurich) managed to reduce their proportions in 2006, but the opposite occurred in the cantons that had initially had very low proportions of students in the lowest reading skill levels (Fribourg, Vaud). In other words, the differences in reading literacy between the cantons are gradually evening out.

60 **PISA reading literacy results, proportion of students with low reading skills (Level ≤ 1)**

Data: *IRDP, 2002, 2005, 2008, PISA Research Community in German-speaking Switzerland / Principality of Liechtenstein, 2008*

Switzerland (indicated here in yellow) has not yet achieved its objective of reducing the percentage of students with low reading levels from 17.5% (2000) to 14% (2009). The percentage was nevertheless brought down to 15% by 2006.



Other assessments of academic achievement

Very few cantons have attempted to measure academic achievement at a younger age than for the PISA assessment or with tests other than PISA at the end of compulsory education. Cantonal Year 9 assessments are more commonly found in the French-speaking region than in the German-speaking region. Of the three ability groups in the Canton of Aargau, only students attending the school for the high-ability group take a final examination upon completion of Year 9. In the entire German-speaking region of Switzerland, this is the only final examination that is equivalent to the *Épreuves certificatives* (in the Canton of Geneva and the Canton of Vaud), the *Diplôme* (in the French-speaking parts of the Canton of Fribourg) and the *Épreuves de fin d'année* (in the French-speaking parts of the Canton of Valais). These Year 9 assessments can all be used to certify individual academic achievement and may form part of the admission procedure to specialised schools. The results of Year 9 assessments are generally only sent to the students, their parents, the students' teachers and the local school administration. They are not sent to the school board or cantonal education authorities *(IRDP, 2008)*. This means that Year 9 assessments cannot be used for the purpose of assessing the effectiveness of lower-secondary education.

In Switzerland, there is, as yet, no nationwide or regional system of monitoring with performance tests at the end of compulsory education of the type referred to in the HarmoS Project *(EDK, 2007a, b)* or in the *Convention scolaire romande (CIIP, 2007)* for purposes of verifying that the educational standards have been achieved. From an international standpoint, Switzerland is in the same position as most OECD Member States when it comes to system monitoring. Only one-third (i.e. 9) of the OECD member states currently hold national examinations and collect data relating to the end of compulsory education *(OECD, 2008a)*.

As mentioned above, lower-secondary education pursues objectives that are not solely limited to academic achievement in individual subject areas. The aim is also to ensure that young people grow up to become responsible citizens

(Erziehungsdirektion des Kantons Zürich, 1991; Erziehungsdirektion des Kantons Bern, 1995). An international study conducted in 1999 found that, when compared with their counterparts in other countries, Swiss students possessed an average level of political awareness *(Oser & Biedermann, 2003)*. In 2004, a test was conducted to determine the historical and political awareness of about 1,500 15-year-olds from the Cantons of Aargau, Bern and Zurich. The overall average was somewhat mediocre at 12.2 of a maximum of 24 points. There were significant gender differences, with boys achieving higher scores. Significant differences were also observed between the three types of lower-secondary school, with the higher ability schools achieving better results *(Moser & Wiher, 2007)*. Knowledge of this type is determined by an individual's personality and family origin, by school characteristics and by classroom teaching as well as by the out-of-school behaviour of students. An open attitude towards discussion in the classroom was also identified as a school-based factor that exerts a positive influence on political awareness *(Maiello, 2003)*.

Completing compulsory education more quickly or more slowly

Compulsory education in Switzerland has a total standard duration of nine school years. Most children complete Year 9 at the age of 15. The progression of individual students can be accelerated at primary school level, in particular, either because children are able to start school at an earlier age or because they are permitted to skip a year. The progression of individual students can also be delayed either because children are kept at pre-school, assigned to a preparatory class, or are required to repeat a school year. In cantons where lower-secondary schools are based on a streamed model (→ *Institutions, page 92*), the repetition of a school year is handled in one of two ways: students who fail to make adequate progress will either be required to repeat the same school year in the same ability group (stable repetition) or must repeat the same year in a more challenging ability group (mobile repetition); this latter case also applies in the case of voluntary repetition. In order to avoid repeating a year, students who fail to make adequate progress may be permitted to continue with the next year but in a less challenging ability group. Students whose progression through compulsory education has been delayed are permitted to leave lower-secondary school after completing Year 8 if they have spent nine years in compulsory education. In other words, these students are permitted to leave compulsory education without ever having achieved the level of knowledge and skills required in Year 9.

In the Canton of Aargau, the educational paths of approximately 5,900 students who enrolled in primary school in 1998/9 were assessed on the basis of their individual data *(Tresch & Zubler, 2009)*. Overall, almost half of the cohort examined (47%) deviated from the standard progression either once or twice during the course of their compulsory education, and this percentage does not include deviations resulting from delayed or early admission into school. At lower-secondary level, 3% of students left school after Year 8, as they had already completed nine years of education. Around 25% of the lower-secondary students in Aargau changed ability groups: 12% switched to a more challenging school and had to repeat a school year in order to do so; 6% switched to a less challenging school; 4% did not switch schools but opted for the vocational orientation year or the work experience year. The remaining 3% took a combination of the measures referred to here. In overall terms, the measures

taken over the course of lower-secondary education led to a 2% increase in the proportion of students attending the more challenging schools, bringing these proportions to 38% attending schools for the middle-ability group and 37% attending schools for the high-ability group.

By changing ability groups or repeating years in a streamed model, students generally enhance their chances of enrolling in post-compulsory education, although this is at the price of having to attend school for an extra year. Repeating years either in the same ability group (stable repetition) or in a more challenging ability group (mobile repetition) occur equally often in all parts of Switzerland. However, both options occur more frequently in lower-secondary education than in primary education. Cantons such as Aargau, Schaffhausen, St. Gallen or Zurich, whose lower-secondary education is based exclusively or mainly on the streamed model, report an above-average number of students who repeat a year and switch to a more challenging ability group. Due to a lack of individual data or data assessments in other cantons, it is not possible to determine whether the cooperative model or the integrated model results in less need for students to prolong their lower-secondary education.

Transition from lower to upper-secondary education

The question as to whether students completing their compulsory education possess the knowledge and skills required on the job market or for subsequent forms of education cannot be answered in simple terms. It is academic achievement that is measured first and foremost at the end of compulsory education, but this is not so decisive for the transition to the job market (→ *Chapter Vocational education and training (VET), page 141*). In some situations, social factors or the range of available apprenticeships can play an equally important role. Since academic achievement and the socio-economic conditions of learning are frequently interlinked, it is difficult to determine the influences of these individual factors in isolation.

At present, 10% of all students coming out of compulsory education do not obtain an upper-secondary level qualification by the time they reach the age of 25. Between 3 and 4% experience failure upon enrolment in upper-secondary education, either failing to be accepted in the general education sector or failing to find a suitable apprenticeship or other follow-on solution. The stated educational policy objective of raising the proportion of students with upper-secondary level qualifications from 90 to 95% throughout Switzerland by 2015 *(EDK, 2006b)* will require optimisation of the transition from lower-secondary education to the upper-secondary VET sector. Specific attention should be devoted to helping vulnerable young people to choose and be accepted in a VET programme. Based on eleven different sets of guidelines, the project run by the Swiss Conference of Cantonal Ministers of Education (EDK) entitled *Nahtstelle obligatorische Schule-Sekundarstufe II* (Interface between compulsory education and upper-secondary education) is coordinating 18 projects designed to optimise the transition processes.

On behalf of the *Nahtstelle* project, *Häfeli and Schellenberg (2009)* analysed around 60 selected studies and projects relating to the transition from lower-secondary education to the world of work in Switzerland over the past ten years. The researchers succeeded in identifying some fifty success factors relating to personal and family traits, school, workplace or social environ-

ment that can contribute to a successful transition. Based on an analysis of those success factors, a large number of recommendations were made as to how the transition process could be optimised. Some of these recommendations included early detection of the risk of failure and careful supervision of young people (case management, mentoring schemes). Other recommendations included easing the transition from lower to upper-secondary levels and creating less challenging apprenticeship positions. As part of the *Nahtstelle* project, relevant guidelines are being compiled for a variety of target groups.

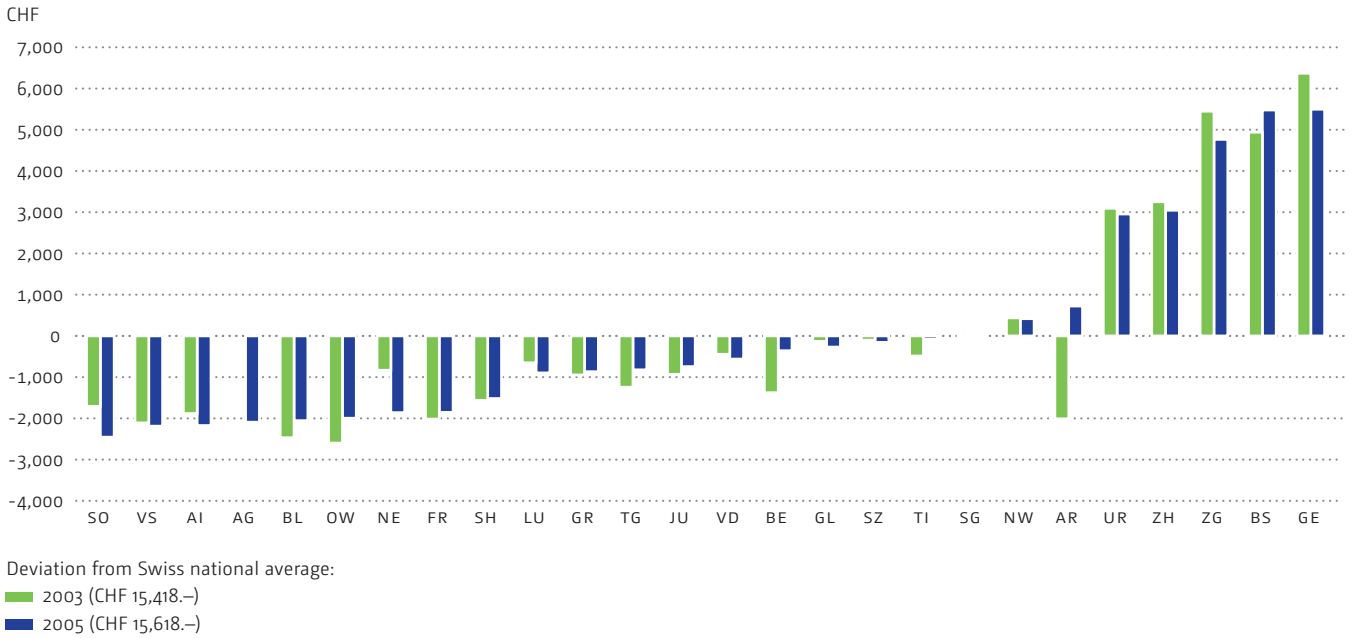
Efficiency/Costs

Efficiency is understood as the extent to which an educational policy objective can be attained with the least amount of resources or the extent to which a maximum return can be achieved with the available resources (→ *Chapter Definitions, page 23*). Efficiency can be measured on the basis of real input (teaching hours, teaching staff, etc.) or monetary input. Since reliable and comparative data on real inputs are rare, the Swiss Education Report focuses primarily on funding inputs. It is clear, however, that this information is also only comparable to a limited extent.

Intercantonal comparison of education expenditure per student

A comparison of education expenditure in individual cantons (→ Figure 61) revealed that, between 2003 and 2005, the difference between the highest and lowest education expenditure per student fell by a good CHF 1000 (11%).

61 **Education expenditure per student, deviations from Swiss national average, by canton, 2003 and 2005**
Data: FSO



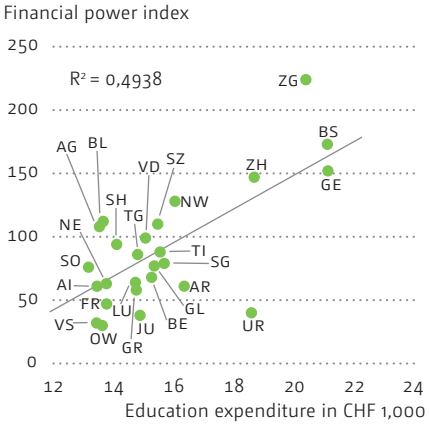
This means that the gap between the amounts spent by individual cantons is narrowing. Despite this, the differences are still so great (the differential between the most expensive canton and the cheapest canton is more than 50% of the average cost per student throughout the whole of Switzerland) that it is difficult to imagine that they cannot be due to different methods employed for measuring expenditure. The differences can be partly explained by different price levels for the inputs in some cantons. These prices (especially teachers' salaries) depend on the financial resources of the canton concerned, for example. If a canton has considerable financial resources, it is more likely to be able to pay high salaries to civil servants, and this is reflected in a higher level of expenditure per student. Figure 62 draws a correlation between education expenditure per student in lower-secondary education and the financial resources of each canton. The positive correlation coefficient of about 0.5 indicates that much of the deviation in the expenditure per student can be attributed to differences in input prices.

Additional factors that explain the deviations include the real level of the individual inputs. Cantons with identical input prices, for example, will naturally spend more per student if the student-teacher ratio is higher – in other words, if class sizes are smaller.

62 **Comparison of education expenditure per student based on the financial power index of each canton, 2005**

Data: SFAO, FSO

The four cantons with the most financial resources (Zug, Basel-Stadt, Geneva and Zurich) also spend the largest amount per student. Most cantons with a spending power index of 100 or lower spent between CHF 2,000 and CHF 4,500 less per student.



R^2: Correlation coefficient

International comparison of education expenditure

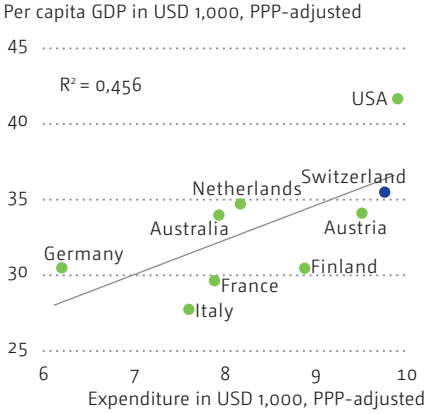
If we compare the average expenditure per student in Switzerland with that of other countries (→ Figure 63) and correlate these expenses with Gross Domestic Product (GDP), then the picture that emerges is similar to the one established in the intercantonal comparison. Wealthier nations have higher input prices (mainly with regard to salaries) and therefore spend more on each real input.

If we compare various OECD countries with Switzerland, it becomes apparent that, as Switzerland has one of the highest per capita GDPs, it also spends the highest amount compared to other countries. In addition to salary levels, the differences in terms of real inputs – class sizes, the number of lessons per student and the number of lessons per teacher – also have an impact. As far as Switzerland is concerned, relatively high teacher salaries, a large number of lessons per student and small class sizes tend to drive costs up, while the heavy workload for teachers reduces the overall cost somewhat.

63 **Annual expenditure for lower-secondary education per student, in relation to per capita GDP, 2005**

Data: OECD, FSO

Example: While France, Germany and Finland all report per capita GDP of about USD 30,000, their expenditure per student differs considerably. The difference in spending between Germany and Finland, for example, came to USD 2,675.



The effects of deployed resources

A comparison of costs does not constitute a measurement of efficiency. Efficiency can only be measured if a correlation is drawn between costs and effects. Efficiency differences can result from two different factors. The first of these is if identical resources are deployed but have a dissimilar effect. In other words: an educational entity (school, canton or state) is more successful at converting the available inputs into academic performance (output). The second source of efficiency differences is a different mixture of inputs, which can produce efficiency gains if an educational facility makes a better choice of inputs and achieves greater efficiency. Typical examples of a different mix of inputs are the class sizes or, put in different terms, the number of full-time-equivalent teaching staff deployed in each class. The Cantons

of Zurich and Solothurn, for instance, deploy approximately 1.25 full-time equivalent teaching staff per class, while in the Canton of Geneva the figure is 2 full-time equivalents *(FSO, 2008h)*.

A comparatively larger deployment of resources does not automatically mean that resources are being used less efficiently, not even if the higher inputs result in lower output. It is always important to consider the overall context in which the output was achieved. If, for example, a municipality is allocated more resources to compensate for a so-called less favourable student composition and its schools still achieve a lower level of performance than all other schools, this does not mean that the resources are being used inefficiently. It is impossible to know whether the academic results in the municipalities receiving more resources might actually have been even worse had they only been given the average level of resources. Inefficiencies will certainly occur, however, if schools with greater resources at their disposal either do not know how to use these resources effectively or have no incentive to make effective use of these resources in practice.

One way to increase efficiency is to replace costly inputs with less costly inputs that have a similar, positive effect on school performance. In this regard, the question frequently arises as to which tasks teachers are required to perform in addition to teaching. In some situations, teachers could actually teach more effectively if support personnel were assigned to perform the tasks that hinder teachers in performing their core task. On the other hand, some of the teachers' duties could be performed with the same degree of effectiveness by other categories of personnel, but at a lower cost. International comparisons have shown that lower-secondary schools in Switzerland rarely have recourse to ancillary staff, which means that the lion's share of the tasks that arise within schools are conducted by (highly-paid) teaching staff (→ Figure 64). Whether or not it would make sense or be possible to increase the number of ancillary staff employed in Swiss lower-secondary schools also depends to a decisive extent on the average size of the schools in question. The larger the school, the more worthwhile it is to take on ancillary staff. The optimum size of a school, however, depends on the sociocultural context in which the school operates. The more heterogeneous the context, the more effective it is to have smaller schools (see *Picus, 2001; Pan, Rudo & Smith-Hansen, 2003*).

64 **Education expenditure in 2005 as a percentage of total expenditure**
Data: OECD

Country	Salaries for teaching staff	Salaries for other staff	Other ongoing expenditure
Switzerland	71,9	13,2	14,8
Italy	64,7	16,5	18,8
France	59,5	23,2	17,3
Austria	58,2	20,9	20,9
Finland	52,3	12,4	35,3
Sweden	50,6	17,8	31,5

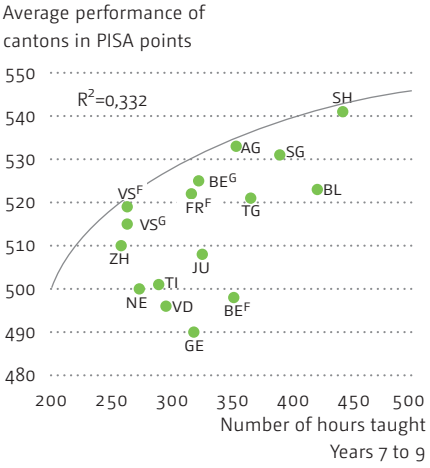
The relation of teaching hours to performance

Since it is difficult to establish correlations between monetary inputs and academic performance as an output for purposes of analysing efficiency, the obvious intermediate step is to consider the real inputs in relation to the output. Figure 65 compares the number of teaching hours to student performance in the natural sciences. At the time of the PISA assessment in 2006, the difference between the cantons with the highest and lowest number of cumulative teaching hours in the natural sciences (Years 7, 8 and 9) was over 180 hours. Even though there is a certain lack of clarity as to how the number of teaching hours for the natural sciences was determined (biology, chemistry, physics and geography were the subjects selected), there is nevertheless a connection (a correlation of 0.33). Cantons offering more teaching hours tend to have students who perform better. The clearest example of this is the Canton of Schaffhausen. At the same time, however, four cantons with a virtually identical number of teaching hours (between 316 and 325) achieved very different results of between 490 and 525 points *(Ramseier, 2008; Moser & Angelone, 2008)*. This shows that one conclusion frequently drawn by researchers is actually correct, namely that the correlation between inputs and outputs is so low in reality because too many observed entities (in this case, the individual cantons) have an inefficient relationship between inputs and outputs. This can be most effectively illustrated in graphical terms by drawing a line between the cantons with the best input-output ratios (the so-called efficiency frontier). This shows that most cantons are not situated on the efficiency frontier, but are actually considerably below it.

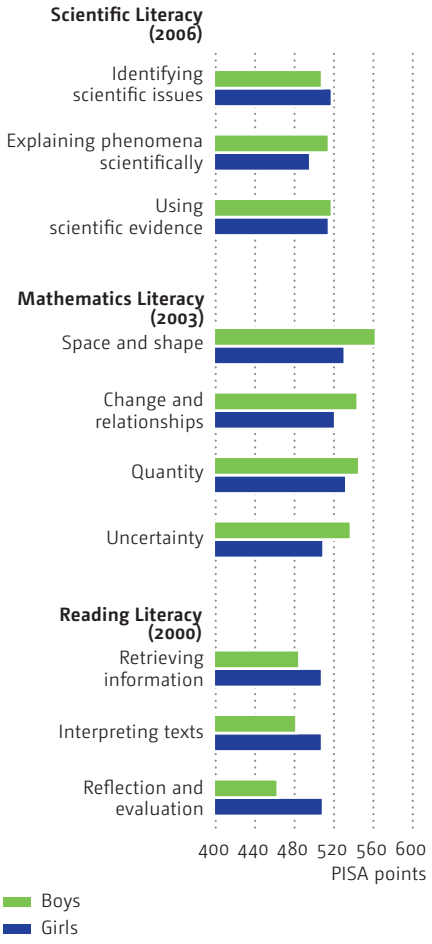
A considerable amount of additional information would, however, be needed to assess the efficiency of increasing the number of teaching hours and thus draw conclusions that could be used in making education policy decisions. First of all, we would need to determine whether the increase in efficiency, i.e. the better performance in cantons with more teaching hours, is really caused by the duration of teaching and not by other characteristics of the cantonal school systems, which cannot be determined by bivariate analysis. In the event of additional teaching hours having a positive effect, it would then need to be considered that any increase in the number of teaching hours in one subject is only achieved at the expense of the teaching hours in another subject. Such measures are therefore only justifiable if the advantage gained from increasing the number of teaching hours in one subject outweighs the disadvantage resulting from the reduction in teaching hours for the other subject. This output can only be determined by measuring the outputs in both subjects. And the output not only needs to be measured but needs to be evaluated in social terms too, since, on the job market, student performance in one subject will not necessarily be rated equally with student performance in a different subject. Only after all these issues have been clarified and considered can the resulting information be channelled into education policy decisions. In addition, there is the fundamental question of whether the benefit gained by offering additional teaching hours could not also be achieved more efficiently by other means. In a given situation, the use of different learning methods or education technologies could enable existing lesson time to be used more effectively. Measures such as those described here would also need to be assessed not only in terms of time efficiency but also from the viewpoint of economic efficiency.

65 **Comparison of the number of teaching hours in natural sciences (Years 7, 8 and 9) and student performance in the PISA assessment**

Data: *FSO/EDK, 2007*



66 **Average PISA performance by gender and subject area, in Switzerland**
Data: *FSO/EDK, 2007*



Equity

Equity in lower-secondary education can be assessed on the basis of several criteria. The prime consideration, however, is normally whether all children are equally able to succeed in education and develop their skills regardless of their gender or family background. In addition to family background (social and migration status) and gender, we also need to consider other aspects relating to the social composition of schools and classes and the range of available classes in each canton as possible factors that can influence the educational opportunities afforded to each individual. The PISA assessments have provided a substantial amount of material that enable factors such as equity in lower-secondary education in Switzerland and other countries to be well documented.

Differences in performance by gender

In every country, girls perform significantly better in reading than boys. At the same time, however, boys perform better than girls in mathematics in 22 of the 30 OECD countries. In the natural sciences, the difference between the genders is only slight. Only in eight countries are the results statistically significant *(OECD, 2007c)*, with boys performing better in the natural sciences than girls in six countries, Switzerland included. The fact that boys are much more familiar with environmental issues in Switzerland is one of the reasons for the difference in achievement between boys and girls in the natural sciences *(FSO/EDK, 2007)*.

If the results are differentiated according to the three processes in natural-sciences competence that were tested, as shown in Figure 66, we find further differences in the natural sciences category. In all the OECD countries, girls achieved higher scores in the «Identify scientific issues» section of the test. The opposite holds true for «Explain phenomena scientifically», which accounts for just under half the set problems in the natural sciences category. Here, boys obtained the best scores in all the OECD countries.

Since educational policy objectives assume that all students, irrespective of their gender, are able to achieve identical results in all school subjects, the question then arises as to whether the persistent gender-specific differences in performance are the result of a lack of equity. We have too little information, however, to determine whether gender-specific differences also have an impact on outcomes, such as the likelihood of a student being able to attend a school for a higher ability group.

Migration and language

Students with a migration background generally perform less well than young people of Swiss origin. The disadvantage suffered by young people with a migration background is especially pronounced in cases where the young people concerned also come from families of low socio-economic status. In this case there is a combination of two factors that have a negative impact on their education (→ Figure 67). In the case of the PISA analyses, this is seen in the fact that the performance scores for students with a migration

background are still poorer by a statistically significant extent if the influence of the socio-economic background is controlled for.

The parents of 15-year-old students of Swiss origin have generally completed an average of 12.6 years of education, while the parents of second-generation immigrants have completed an average of only 10.7 years of education *(OECD, 2006c; SCCRE, 2006)*. The performance of non-Swiss nationals who were born and educated entirely in Switzerland (second generation) is significantly higher than that of young people who were born abroad and moved to Switzerland later (first generation). This means that the generation that had to make the effort to integrate suffers another significant disadvantage. Compared with other countries, Switzerland features among those countries in which there is a clear improvement in educational opportunities for second-generation immigrants as compared with first-generation immigrants. What this means in practical terms is that school-based education in Switzerland is making a significant contribution to improving equity for migrants.

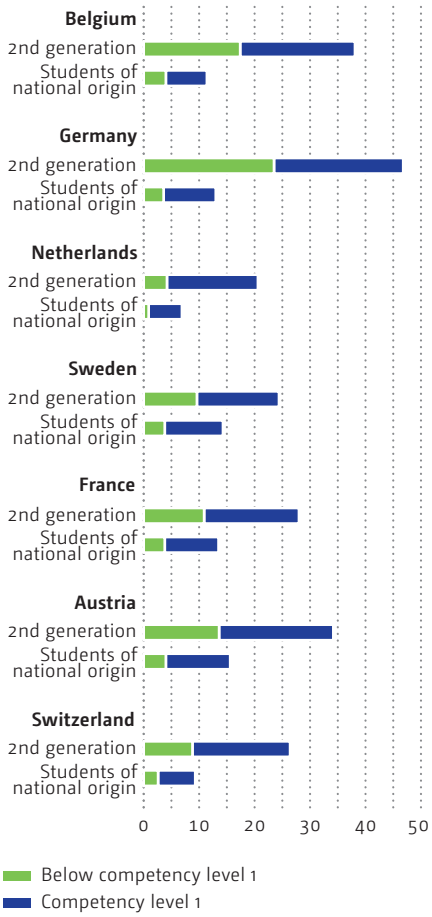
Socio-economic background and performance in the 2006 PISA assessment

Since the PISA assessments were first conducted in OECD member countries in 2000, the correlation between a student's social origin and his/her performance has become less pronounced both in the field of reading literacy scores and – albeit to a lesser extent in Switzerland – in the fields of mathematics and natural sciences *(OECD, 2007c)*. Performance in the natural sciences does not differ from the OECD average, while, for mathematics and reading, the socio-economic inequality in the PISA results for Switzerland was greater than the OECD average. Within Switzerland, there are relatively large differences between individual cantons as far as the impact of socio-economic origin on individual performance is concerned (→ Figure 68). A comparison of individual cantons reveals two interesting findings. First of all, in the French-speaking cantons (the left-hand half), there is a much weaker correlation between social origin and performance at the average ability level, which does not differ substantially from that found for Switzerland as a whole. The second interesting observation is that, in the German-speaking cantons, the greater the dependence of educational outcomes on social factors, the higher the average level of performance in the given canton is seen to be. In other words, it would appear that in the German-speaking cantons, at least, good results for the canton go hand in hand with greater social disparity in performance.

Generally speaking, the correlation between the social origin of students and the performance achieved in the canton is less pronounced in the French-speaking region. The more pronounced influence of socio-economic background on individual performance in the German-speaking region can be partially, but not fully, attributed to the different composition of the migrant population. If allowance is made in the calculations for whether the students tested speak the local language of Switzerland as their first language, then the pure influence of socio-economic background is reduced, especially in those German-speaking cantons with a high disparity in performance that is attributable to social factors (→ Figure 69).

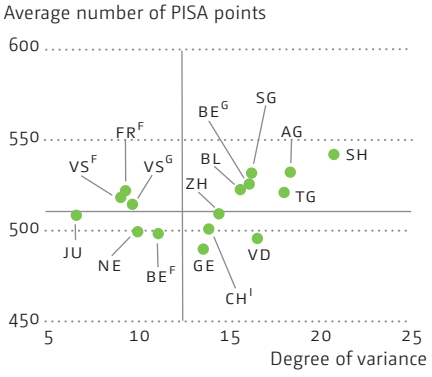
67 **Differences in performance between second-generation migrants and native-born Swiss students**

Measured by the proportion of students obtaining the lowest competency levels in PISA 2006 (Scientific Literacy)
Data: OECD



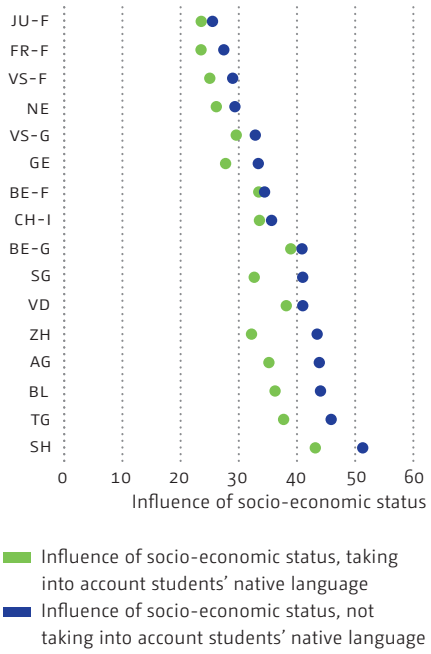
68 **Differences in performance due to social factors and average performance in Scientific Literacy, 2006**

Degree of performance variation due to socio-economic status
Data: F*SO/EDK, 2007;* Calculations: SCCRE



69 **Influence of social background on performance in Scientific Literacy, by canton, 2006**

Data: *FSO/EDK, 2007;* Calculations: SCCRE

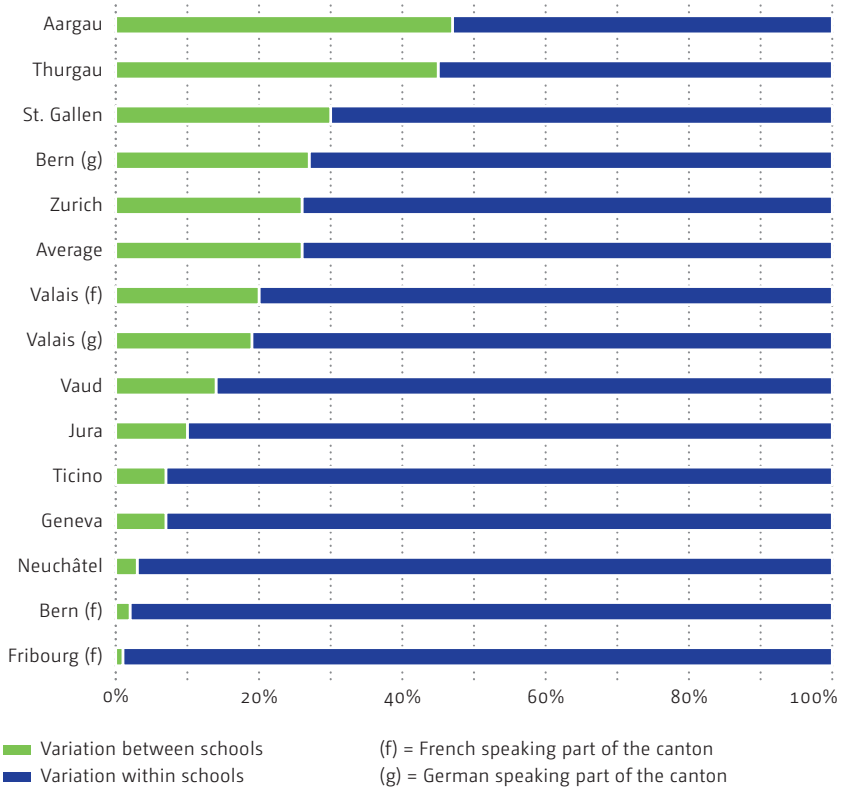


Class composition

The 2003 PISA data for mathematics and the 2006 PISA data for natural sciences revealed greater disparities in performance within individual schools than between different schools. Here too, however, major differences were observed between the French, Italian and Romansh-speaking cantons and the German-speaking cantons. If we consider the fact that lower-secondary schools in the German-speaking region segregate students by ability to a much greater extent, then it would actually be unusual for there to be only small differences in performance between lower-secondary schools which could be catering for a different ability group (⟶ Figure 70). It is not possible to definitively state whether more homogeneous classes would provide a higher average level of performance. It must also be borne in mind that the PISA surveys took random samples at school level and not at classroom level, and it is actually the composition of the class and not necessarily the composition of the school that probably has an impact on student performance. It has to be said that small differences in performance between the individual schools would seem to indicate that it does not really matter which type of school students attend in the canton concerned (although the actual class might indeed have an impact). In addition to the segregation of students resulting from ability grouping and level grouping, in most of the German-speaking cantons the spatial segregation of the resident population might also influence the extent of the performance differential between individual schools (see *Coradi Vellacott, 2007*).

70 **Variation in performance between and within individual schools, 2003**

Data: *Faggiano, Mariotta & Origoni, 2007*

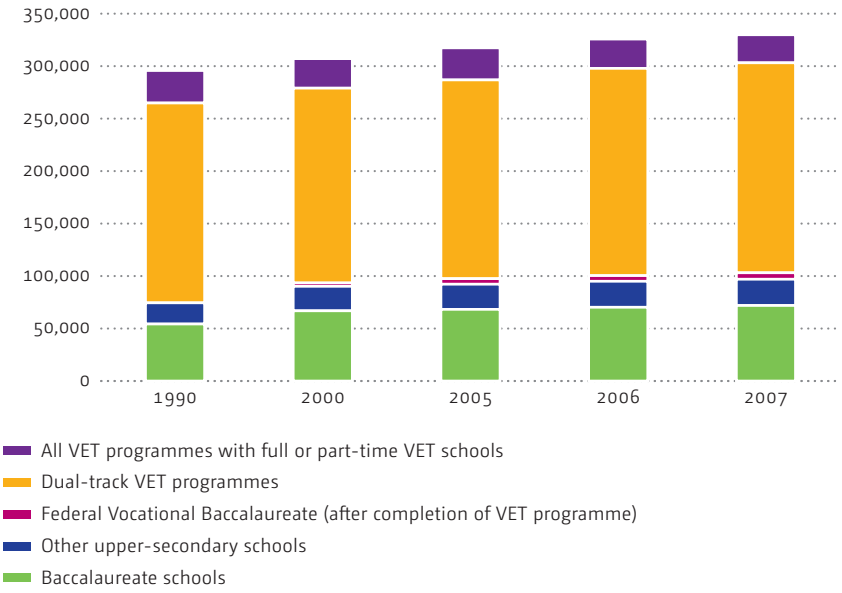


Upper-secondary education

Vocational education and training (VET) and general education sectors

Upon completion of compulsory education, students may enrol either in the vocational education and training (VET) sector or the general education sector. The VET sector is comprised of VET schools and dual-track VET programmes, where students learn theory at school and do paid apprenticeships at host companies. This is by far the predominant form of upper-secondary education in Switzerland, since approximately 60% of all students coming out of compulsory education enrol in VET programmes with apprenticeships (→ Figure 71). In the general education sector, it is the Baccalaureate schools that predominate, followed by the upper-secondary specialised schools. Taken together, both types of VET programme comprised approximately 70% of all students coming out of compulsory education in 2007. In 1990, this proportion was nearly 75%. Although the proportion of young people enrolling in general education programmes has increased slightly at the expense of the proportion enrolling in VET programmes, most young people nevertheless opt for the VET sector. It is this aspect that sets Switzerland's education system apart from that of most other industrialised countries.

71 **Number of students enrolled in upper-secondary education, by type of education**
Data: FSO



The main forms of upper-secondary education, both those in the VET sector (i.e. dual-track VET programmes, entirely school-based VET programmes and preparatory courses for the Federal Vocational Baccalaureate) and the general education sector (i.e. Baccalaureate schools and specialised schools) differ in terms of structure, organisation, qualification and student body, and some of these differences are considerable. For this reason, each has been given a chapter of its own in what follows, and no attempt will be made to carry out a comparative, overarching analysis. The present chapter covers

the interim solutions that neither form part of the period of compulsory education nor fall within the realm of upper-secondary education. Because of their quantitative significance, interim solutions constitute an important educational, job market and socio-political link between lower-secondary and upper-secondary education.

Upper-secondary level graduation rates

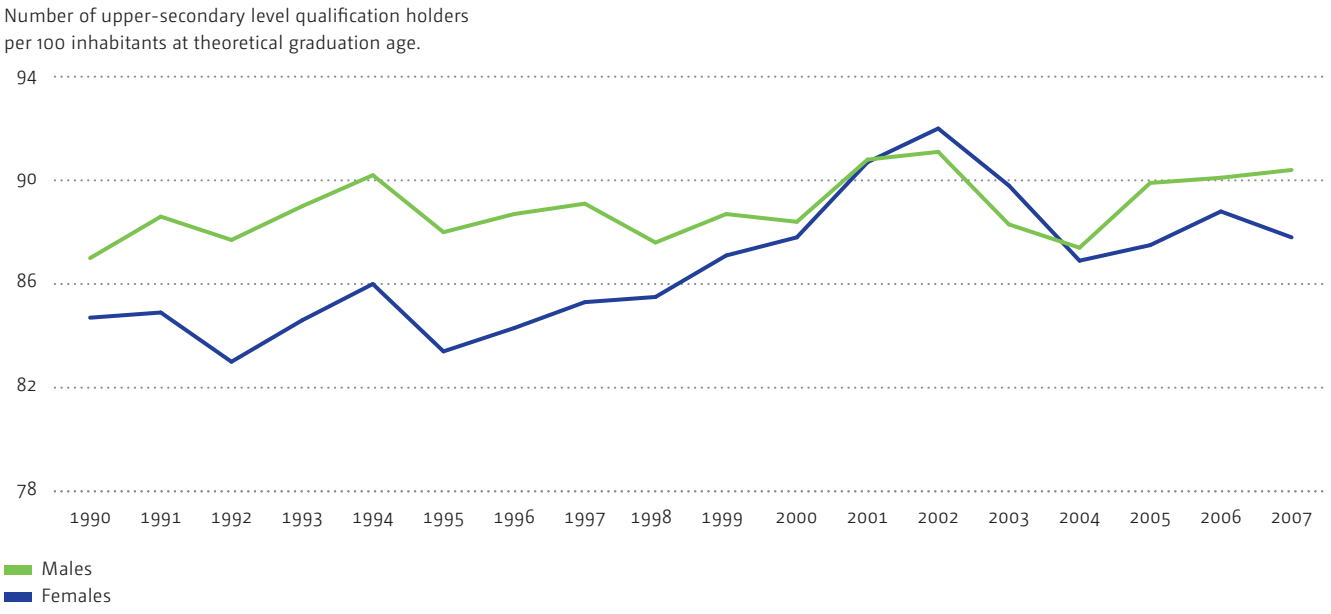
If we study the job-market outcomes and social integration of individuals with different educational backgrounds in all the industrialised countries (→ *Chapter Cumulative effects, page 269*), we find that the period of compulsory education is no longer sufficient in itself. In order to achieve social and economic integration with a minimum level of difficulty, young people now require an upper-secondary level qualification at the very least. It is therefore not at all surprising that almost every country has set itself the target of achieving the highest possible graduation rates for upper-secondary education as a top priority. In Switzerland, the Confederation, the cantons and professional organisations are working together to increase the proportion of upper-secondary level qualification holders to 95% by 2015.

At present, upper-secondary level graduation rates, as calculated by the Federal Statistical Office, are about 89%, with the female graduation rate being slightly below average (→ Figure 72).

The guidelines for the ***Nahtstelle* (Interface) project** were approved by the Swiss Conference of Cantonal Ministers of Education (EDK), by professional/industry organisations and also by various federal agencies on 27 October 2006.
The objectives of the *Nahtstelle* project are as follows: (1) Increasing the proportion of students obtaining upper-secondary level qualifications from the current 90% to 95% by 2015; (2) Avoiding lost time through students changing apprenticeship, changing schools or waiting a year; (3) Identifying and providing targeted support to problem students at an early stage (during compulsory education). This chapter presents the facts for all three topics, as we currently know them: the proportion of students who obtain upper-secondary level qualifications; interim solutions attended between lower and upper-secondary education; the correlation between academic performance in compulsory education and subsequent success in upper-secondary education.

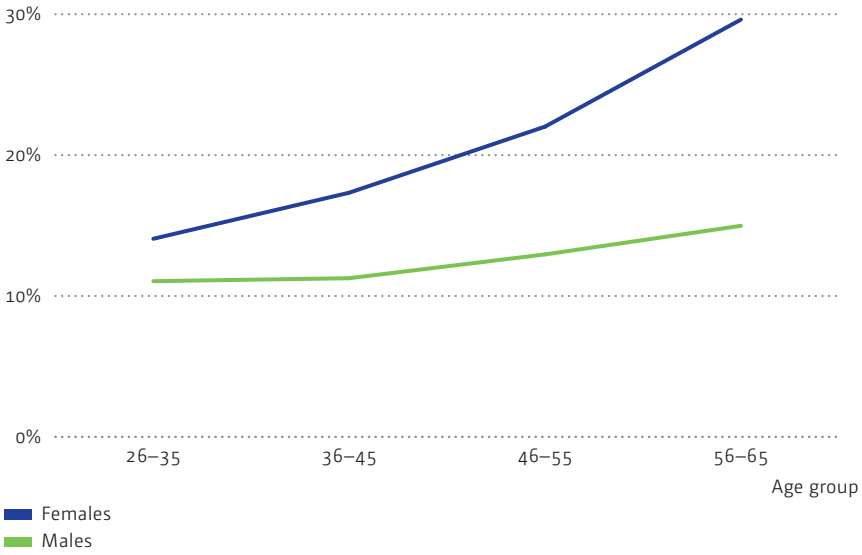
72 **Proportion of students obtaining upper-secondary level qualifications, by gender, 1990–2007***

* There is no simple explanation for the fluctuations that can be seen here. However, these fluctuations took place in tandem with the economic cycle.
Data: FSO



73 **Proportion of adult inhabitants who lack upper-secondary level qualifications, by age and gender, 2007**

Data: FSO



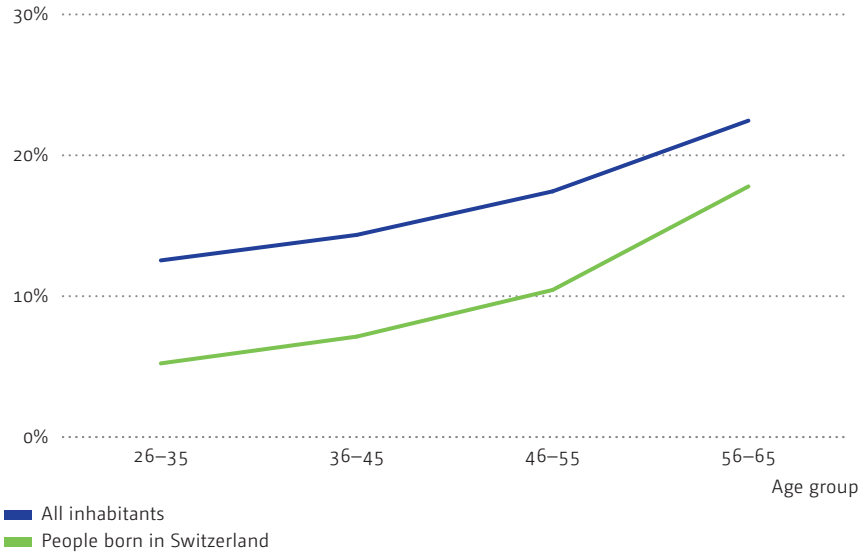
The rate for females has nevertheless increased somewhat since the 1990s, when it stood at 84.9%, having risen by four percentage points, to 88.9%, during this decade. Over this same period, the male graduation rate has remained virtually constant at about 90%. These graduation rates were calculated by comparing the estimated number of upper-secondary level qualifications obtained in a given year with the number of young people in the age bracket within which upper-secondary qualifications are theoretically obtained. The fact that the exact number of upper-secondary level qualifications issued is not known probably has less of an impact on the accuracy of the estimate than the fact that, for a wide variety of reasons, a large number of young people only achieve an upper-secondary level qualification at a later stage. We also need to consider the fact that, although upper-secondary level graduation rates may well be an indicator of academic achievement over a given period, they do not enable us to evaluate the performance of compulsory education in adequately preparing students for upper-secondary education. This is because the upper-secondary student body also includes young people who have not attended compulsory education in Switzerland or have only done so in part. No solution to this problem can be found due to the absence of data on individual educational paths; even adopting a different statistical approach would not solve this problem.

The number of upper-secondary level qualifications obtained is underestimated due to the fact that a number of people obtain those qualifications at a later stage in their lives, and to correct this problem we would need to use statistical data of a different sort. For example, it would be possible to calculate the number of upper-secondary level qualifications using data from the FSO's Swiss Labour Force Survey (SLFS) or, alternatively, data from the Swiss Household Panel or the Federal Population Census, since this includes all age ranges, and thus takes in upper-secondary level qualifications obtained at a later stage in life. We should also consider the fact that the proportion of Swiss inhabitants who lack upper-secondary level qualifications is higher rather than lower among older cohorts (→ Figure 73). On the one hand, there are fewer upper-secondary level qualification holders among

74 **Proportion of adult inhabitants who lack upper-secondary level qualifications, 2007**

All Swiss nationals residing in Switzerland and foreign nationals born in Switzerland

Data: FSO



older cohorts (the cohort effect) and, on the other hand, the statistics are still influenced to a great extent by the wave of labour migration up to the mid-1990s which brought mainly poorly-qualified immigrants to Switzerland.[1] It must, however, be said that the pronounced gender difference in the number of upper-secondary level qualification holders has been almost entirely levelled out in the youngest age categories. This matches the FSO's statistics on upper-secondary level graduation rates (→ Figure 72).

Due to the lack of data relating to individuals, the impact of migration on statistics cannot be fully quantified. However, if we examine the education level of those individuals (both Swiss citizens and foreign nationals) who were born in Switzerland and who we can fairly assume spent their entire period of compulsory education in Switzerland, we find that the proportion of individuals who lack a post-compulsory qualification (especially among the youngest cohorts) already falls within the education policy objective set for 2015. However, this particular method of calculation is somewhat overly optimistic, since, in order to identify the correct proportion of people holding an upper-secondary level qualification, we would also need to include those individuals who, though not born in Switzerland, received either all or part of their education in Switzerland.

Generally speaking, when selecting indicators, the first thing is always to determine exactly what we are attempting to assess. If we want to measure how well the compulsory education system of a given country prepares young people for obtaining an upper-secondary education as well, then we need to exclude both migrant workers and any other individuals who received only

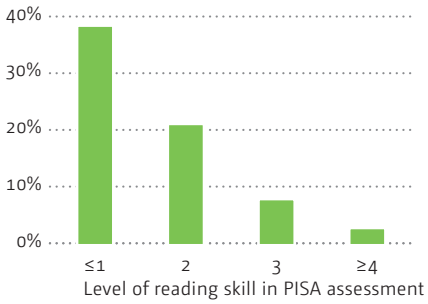
1 Immigration and emigration distort educational statistics in almost all countries, even if information is available regarding the education received by foreign nationals in their home country. Thus, for example, in countries that suffer from a significant brain drain (i.e. a high rate of emigration among highly-qualified citizens), the average level of education is reduced.

part of their compulsory education in Switzerland. If, on the other hand, we want to determine the level of qualifications held by the resident working-age population, then we would need to include the country's entire population, regardless of where they received their education or how long they have been living in Switzerland.

Success at upper-secondary level and achievement during compulsory education

75 **Proportion of TREE young people, who had not yet obtained an upper-secondary level qualification in 2006**

Data: *Stalder, Meyer & Hupka-Brunner, 2008*



TREE is a longitudinal study that has kept track of the young people who took the PISA assessment in 2000. This study has enabled us to establish a direct correlation between compulsory education and the likelihood of success in upper-secondary education. Of the young people who took the PISA assessment at the age of 15 in 2000, 16% had not yet obtained an upper-secondary level qualification by the time they reached the age of 21 in 2006 (→ Figure 75).[2] If we now examine the proportion of those young people who have not (yet) been successful in relation to the performance they achieved in the PISA assessment in 2000, it becomes apparent that the likelihood of a young person obtaining an upper-secondary level qualification is not a matter of chance. In the case of the young people who obtained the highest skills level (≥ 4), only 3% lack an upper-secondary level qualification while, in the case of the young people who obtained the lowest skills level (≤ 1), the percentage is over ten times higher. The most recent TREE study (2010) will reveal how many of these young people still managed to obtain an upper-secondary level qualification by the age of 25.

Generally speaking, young people who perform poorly during their compulsory education are not only more likely to drop out of upper-secondary level education and training (such as not finishing an apprenticeship and/or VET programme), they are also more likely to experience difficulty in finding an apprenticeship and/or VET programme to begin with. They are more likely to find themselves in an interim solution between lower-secondary and upper-secondary education. While interim solutions certainly provide young people with a more effective preparation for upper-secondary education, they may also severely delay their progression towards obtaining an upper-secondary qualification. These interim solutions, which are neither part of compulsory education nor lead to an upper-secondary qualification will therefore be discussed in the next few paragraphs.

2 This percentage is higher than what would be expected on the basis of the FSO's reported upper-secondary level graduation rates. One reason for this is the fact that only one cohort is being tracked. At the same time, the FSO's reported graduation rates vary from year to year. More importantly, the TREE cohort completed its transition to upper-secondary education at a time when the economy was entering a slump phase. This required many young people to follow a more circuitous route or wait for the desired apprenticeship vacancies. This, in turn, delayed their progression towards obtaining their upper-secondary level qualifications. It can therefore be expected that, in the coming years, the number of people obtaining upper-secondary level qualifications will continue to rise, even in the case of the TREE cohort. However, TREE slightly underestimates the proportion of those who do not obtain an upper-secondary level qualification since it does not take into account the young people with severe mental disabilities who did not take the PISA assessment.

Interim solutions

Interim solutions provide those who have finished their compulsory schooling and are experiencing problems in finding general or vocational upper-secondary education with a means of bridging the gap. At present, there is no standard definition throughout Switzerland for interim solutions. These can include additional school years to prepare young people for a specific vocation, pre-apprenticeships, motivation semesters, a tenth school year, or even language stays or au pair work abroad. Precisely in the case of these latter options, it is unclear whether interim solutions are intended to offset what has been missed in compulsory education or whether they reflect the fact that the young people involved are still undecided as to which form of upper-secondary education they wish to follow. Interim solutions are also often taken up by young people who would have found a path (e.g. an apprenticeship) but would prefer to undergo a different type of training (→ *Chapter Vocational education and training (VET), page 141*) and thus insert an additional year to bridge the time until they gain admission to the training course of their choice.

The purpose of interim solutions is mostly to facilitate entry into the upper-secondary VET or general education sector. The function of the interim solutions can thus be summarised as follows *(Meyer, 2003)*:

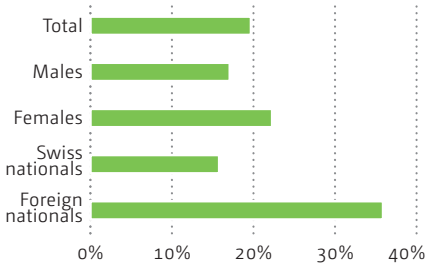
- Compensatory function: to rectify educational, linguistic or other deficiencies
- Orientation function: to help the young person decide what to do after completing compulsory education
- Buffer function: to help the young person to obtain the type of education and training he/she is looking for but which is currently unavailable. The young person must do something meaningful while waiting.

Young people who leave the formal education system for an interim solution, for example, those who do not take the 10th year in education, are also no longer included in the official statistics, since these are unable to track all the available interim solutions. It is thus still difficult today to record the reasons, consequences, quantity and duration of interim solutions.

Interim solutions are offered by a variety of public and private providers *(Egger, Dreher & Partner AG, 2007)*. In most cantons, certain interim solutions (known as motivation semesters) are also offered by the unemployment insurance office on behalf of welfare offices in the municipalities and communities. The role of those particular schemes is clearly a compensatory one. Since the unemployment insurance office is actively involved here, in addition to the education authorities, a coordinated approach to state funding is necessary on efficiency grounds alone. Now that a system of case management has been introduced (see also *OECD/CERI, 2009*), young people are registered at a central location. This enables the various stakeholders to coordinate the content and timing of their activities. In addition, there is a whole range of courses and programmes that young people can attend voluntarily and at their own expense.

76 **Proportion of students in interim solutions, by gender and nationality, 2006**

Data: FSO



Definition used by the FSO:
Interim solutions include school-based programmes such as the voluntary tenth year of education or predominantly one-year courses offered by other general education schools. There are also courses that combine attendance at school with practical training, such as pre-apprenticeships. No data are available on non-school-based programmes such as language stays, au pair work or traineeships.

Very different interim solution rates from one canton to another

In 2006, nearly 20% of all students coming out of compulsory education took an interim solution (based on the definition used by the FSO), amounting to 17,149 individuals in all. The proportion of those completing an interim solution is slightly higher among female students and particularly among foreign nationals, almost 36% of whom attended an interim solution (→ Figure 76).

The proportion of students in interim solutions also varies greatly from canton to canton. While in the Canton of Basel-Stadt, approximately 44% of compulsory-school graduates completed an interim solution, this proportion was as low as 5% in the Canton of Uri and approximately 7% in the Cantons of Appenzell Innerrhoden and Ticino.

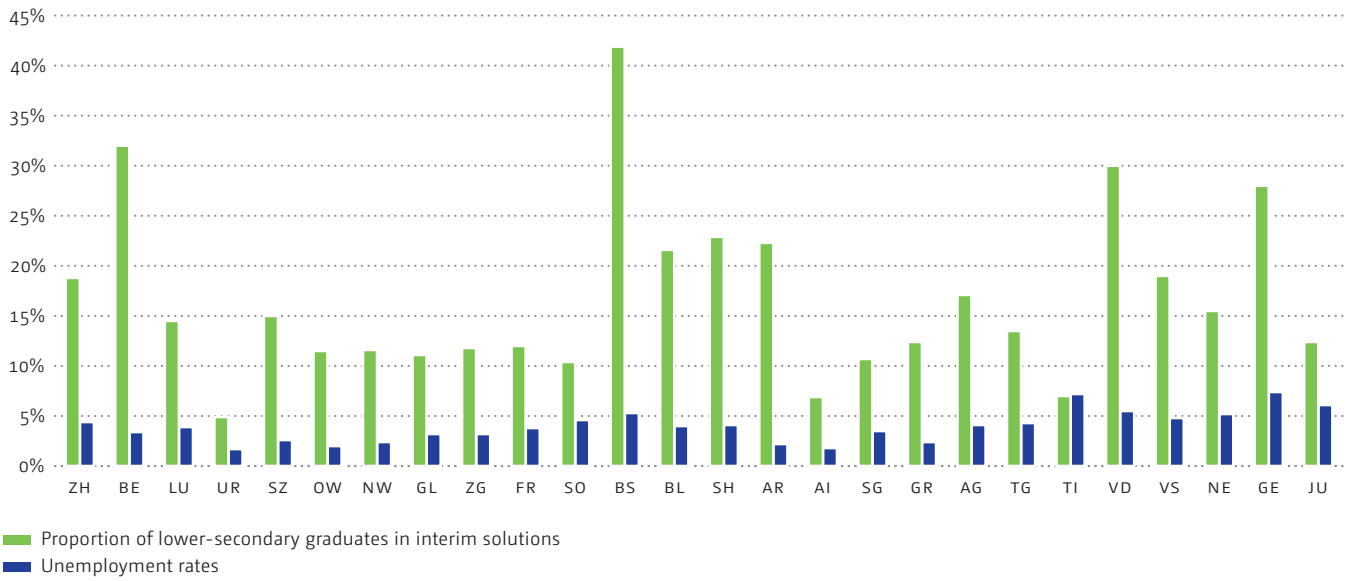
The proportion of those who have completed their compulsory schooling and who are in interim solutions does not correlate with the situation on the job market in the canton concerned (→ Figure 77). There must therefore be other reasons for the major differences in the spread of interim solutions in the individual cantons. One reason could be that the differences are a reflection not only of the job market but also of the interim solutions themselves; their mere availability may also trigger demand. In other words, if interim solutions are available and easily accessible, people are more likely to opt for them.

Effectiveness is largely uncharted

In 2004/5, in the Cantons of Basel-Landschaft, Bern, Vaud and Zurich, between 62% and 75% of those taking part in VET-related interim solutions successfully enrolled in further education, or a three or four-year apprenticeship associated with a corresponding VET programme, found an uncertified two-year apprenticeship, or enrolled in a two-year VET programme *(Egger, Dreher & Partner AG, 2007)*. It is not possible to assess the effectiveness and efficiency of the system of interim solutions, since, in order to carry out an

77 **Interim solutions and unemployment rate among young people between the ages of 15 and 24, 2006**

Data: FSO, Seco



appropriate evaluation, it would be necessary to monitor the progression route that each young person would have taken had he/she not opted for an interim solution. Likewise, no true assessments have been conducted to compare the effects of the various interim solutions themselves. The percentage of students who have found their own progression route is not meaningful, since it is not by chance that students have taken specific interim solutions.

Private and state-funded solutions

Even if most interim solutions are provided at no cost to the young people or their parents, opportunity-based costs are, in fact, incurred in the form of time. Interim solutions extend the time required for a young person to obtain an upper-secondary level or tertiary-level qualification. This, in turn, delays definitive entry to the job market. The private financial cost of an interim solution thus corresponds to the loss of salary in lifelong income due to the delay in entering the job market. The young people involved must therefore ask themselves whether delaying their entry into a certified form of training at upper-secondary level is truly worthwhile, if such a delay can be avoided. The benefits resulting from an interim solution can be an increased suitability for the type of training subsequently taken up and hence a lower risk of dropping out, a lower likelihood that the young person will change his/her choice of occupation, and greater chances of obtaining tertiary-level qualifications. The high private cost of interim solutions could certainly be balanced out by potentially high returns. The lack of data or relevant research, however, prevents us from determining whether the decisions reached by young people and their parents are always the best ones.

The federal government is also questioning the efficiency of interim solutions. Measures that help young people to avoid interim solutions (e.g. guidance counselling, mentoring or coaching during compulsory education) can generally always be justified by pointing to the high fiscal and social costs that are generally associated with interim solutions. In other words, it is worthwhile investing in the optimum functioning of the lower-secondary education sector in order to avoid the less efficient measure of interim solutions.

The cost of motivation semesters

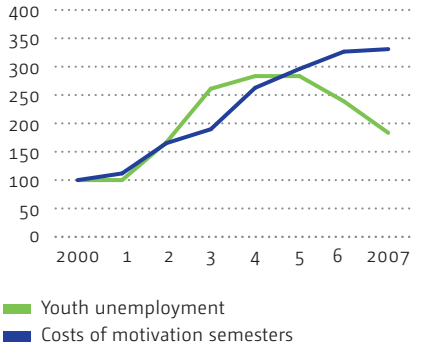
Motivation semesters are organised by the job placement offices in the individual cantons. The overall framework for these is defined by the State Secretariat for Economic Affairs (SECO), and they are funded by the unemployment insurance system. In 2007, a total of 7,500 students took part in motivation semesters. Motivation semesters were introduced as a response to rising youth unemployment. They also take the form of job creation schemes for those who have completed their compulsory schooling and are registered as unemployed and looking for a trainee position. The unemployment insurance office pays for the provision of motivation semesters, and participants are entitled to a monthly salary of CHF 450. It is the payment of a salary that sets the motivation semesters apart from other interim solutions where students do not receive any form of remuneration. While the youth unemployment rate has been falling over the past few years, expenditure on motivation semesters has risen steadily (→ Figure 78).

Since 2000, the cost of **motivation semesters** has tripled while the number of participants has not quite doubled: from 3,300 in 2000 to 7,500 in 2007 (→ Figure 78). While from 2000 to 2004, the rise in costs for the motivation semester could be explained by a rise in youth unemployment, this is no longer the case. The reason for this may be that, although the number of unemployed young people has declined, those young people who are currently unemployed fall into the difficult-cases category and therefore require additional resources to facilitate their integration.

78 **Costs of motivational semesters and youth unemployment**

Data: SECO

Values in 2000 = 100



Baccalaureate schools

Context

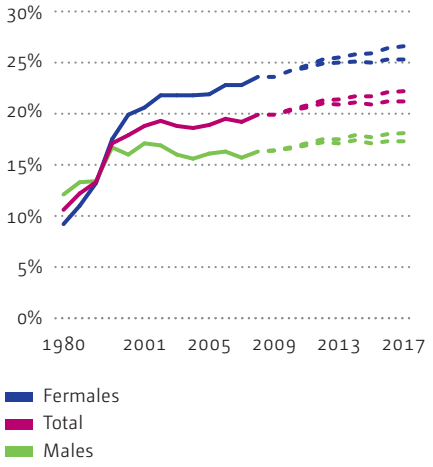
The **proportion of students obtaining a Baccalaureate** within each canton can be calculated by dividing the number of 19-year-olds in a given canton by the number of Baccalaureates awarded in that canton.

The expansion of upper-secondary Baccalaureate schools first got underway in the 1960s. In 1960, the percentage of Baccalaureate holders stood at only 3.8%, but over the two decades that followed, this percentage nearly tripled. Between 1980 and 2007, the proportion then nearly doubled once again (→ Figure 79), with most of that growth taking place between 1991 and 1996. While the initial expansion was an education policy response to technological progress and to the corresponding change in the demand for skills, as the number of Baccalaureate holders increased, educational ambition also became a driving factor. The expansion of Baccalaureate schools (more locations, larger facilities, more teaching staff, etc.), in turn, prompted steady growth in the number of Baccalaureate holders.

From the 1980s onwards at the latest, more female students began obtaining the Baccalaureate, which further fuelled the increase in the proportion of Baccalaureate holders. A turning point was reached in 1993, when the proportion of female Baccalaureate holders exceeded that of male Baccalaureate holders for the first time. This proportion has been increasing ever since. In 2007, the proportion of females stood at 59.2%. One of the main reasons for the increase in the number of female Baccalaureate holders from 2000 onwards is doubtless the fact that the Baccalaureate is increasingly required for admission to training programmes in many «female-dominated» occupations and professions. The former teacher training colleges, for instance, used to admit lower-secondary school graduates to their primary and lower-secondary teacher training programmes. With training programmes for primary, lower-secondary and upper-secondary teachers now being handled exclusively by universities of teacher education, the Baccalaureate has become the new main qualification for admission (→ *Chapter Universities of teacher education (UTE), page 225*).

Demographic changes

79 **Proportion of students obtaining the Baccalaureate, by gender, 1980–2007, extrapolated to 2017**
Data: FSO



In an attempt to predict the proportion of students obtaining the Baccalaureate between now and 2017, the Federal Statistical Office (FSO) has devised two scenarios in which the anticipated percentage growth differs by one percentage point (→ Figure 79). The «neutral» scenario» assumes that the increase observed over the past few years will continue but at a slower pace and that 21.2% of all 19-year-olds in the resident population will hold a Baccalaureate in 2017. The «trend» scenario» assumes that the increase observed over the past few years will continue for a further ten years. With this scenario, 23.2% of all 19-year-olds in the resident population will hold a Baccalaureate in 2017. Precisely how far the proportion will increase over the next few years will also depend on how upper-secondary Baccalaureate schools respond to the demographic decline in overall student numbers (→ *Chapter Vocational education and training (VET), page 141*). If Baccalaureate schools maintain standards at a constant level, then the proportion is not likely to change all that much, even though the overall number of students will decrease. If, however, Baccalaureate schools wish to maintain student numbers to avoid having to discontinue classes or lay off teaching staff, then the proportion of Baccalaureate holders will rise fairly significantly.

80 **Proportion of students obtaining the Baccalaureate by canton, 1980 and 2008**

Data: FSO

The average rate for the years 2006–8 was used instead of the latest available annual rate (2008). In some years, there were (at times major) fluctuations in the annual rate, which were due more to chance than to any particular trend. Using the average rate enabled us to smooth out these fluctuations.

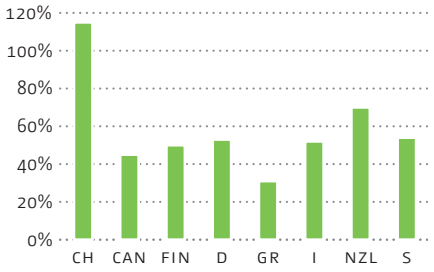
Differences between individual cantons

Since the 1980s, almost all the cantons have recorded a roughly proportional increase in the number of Baccalaureate holders regardless of the original number in the canton concerned (→ Figure 80). In other words, the differences that existed between cantons in 1980 persist thirty years later, but at a higher level, and, while all of the cantons recorded an increase in the number of Baccalaureate holders, this increase is not fundamentally due to those cantons that had a below-average proportion in 1980 having caught up. Nevertheless, some cantons (at the upper end of the band in Figure 80) managed to achieve a much more significant rise in their rate than other cantons (at the lower end of the band in Figure 80). Thus far, no empirically verified explanations have been forthcoming to explain either the different growth rates in the proportions in the individual cantons or the different proportion of students obtaining the Baccalaureate today. It therefore remains unclear whether the different rates can be attributed to differences in demand for Baccalaureate school admission in the different cantons or are due to differences in the initial situation of students (differences in academic achievement in lower-secondary school) or to admission restrictions. Given the absence of verifiable educational policy objectives regarding the proportion of Baccalaureate holders, it is still impossible to assess the major differences that exist between the cantons.

Admission to universities

In 2008, the total proportion of students obtaining either the Baccalaureate or the Federal Vocational Baccalaureate, both considered ISCED 3A qualifications in Switzerland, stood at 31%. From an international perspective, the proportion of Baccalaureate holders is the proportion of students entitled

81 **Proportion of higher education graduates in relation to those entitled to enrol in higher education, 2006**
Data: OECD



In Switzerland, the proportion of higher education graduates (29.8%) expressed in terms of the number of upper-secondary level graduates entitled to enrol in a higher education institution (26%) yields an overall ratio of over 100%. There are several reasons for this: time-related incongruence between the two rates; the difficulty in calculating the relevant rates with a high degree of accuracy; and the proportion of foreign students studying in Switzerland. Nevertheless, it is clear that Baccalaureates are much more important in determining admission to higher education institutions in Switzerland than in other countries, where the comparative ratio is generally below 50%. This means that, on average, only one in two individuals who obtain a qualification equivalent to a Swiss Baccalaureate actually graduates from a higher education institution.

to enrol in a university. The Swiss proportion of students entitled to enrol in a university in 2006 was below average in international terms, since the average proportion within OECD countries was 60%. All of Switzerland's neighbours, apart from Austria (17%), recorded higher proportions. Germany had 40% and France 51%. Only Italy recorded an above-average proportion, however, at 76%. Even if it achieves the forecasted percentage of 35–38% in 2017, Switzerland's proportion will still be below average.

When making such international comparisons, it is important to consider the fact that Baccalaureate-type qualifications differ substantially from one country to another. In most countries that achieve very high proportions, the Baccalaureate is the only general-education upper-secondary level qualification, or the only education qualification at this level at all, since VET alternatives are underdeveloped and unappealing. These general-education qualifications are categorised as Baccalaureate-type qualifications, since they theoretically entitle the holder to admission to university institutions. In practice, however, the situation in most countries is different (→ Figure 81). For one thing, Switzerland is an exception in that it offers universal and examination-free access to universities. Moreover, the chances of successfully obtaining a degree at a university are not the same in all countries. In Switzerland, student selection has taken place prior to admission to upper-secondary education, at the time when students enter Baccalaureate school, while, in other countries, selection takes place at the end of the upper-secondary level based on a much broader cohort of students.

Institutions

With the 2003 cohort of Baccalaureate school students, the implementation of the Rules on the Recognition of Academic Baccalaureates 1995 (MAR 95) had been completed in all cantons and Baccalaureate schools. The implementation of MAR 95 meant that students were given a wider variety of options, thereby enabling them to have more individual educational profiles. Nine Baccalaureate subjects were introduced, consisting of seven compulsory subjects, one freely chosen main specialism and one freely chosen secondary specialism. To obtain their Baccalaureate, students are also required to write a Baccalaureate essay on a topic of their choice. The proportion of time allocated to compulsory subjects was initially set as follows: 30–40% for languages, 20–30% for mathematics and natural sciences (25–35% from 2008 onwards), 10–20% for arts and social sciences, and 5–10% for art. The total time allocation for the main specialism, secondary specialism and Baccalaureate essay, however, was only 15–25% (Article 11 of the MAR 95 regulations). From the 2008/9 school year onwards, the MAR rules were partially revised to introduce the following changes: the natural sciences and the Baccalaureate essay were upgraded; subjects such as biology, physics, chemistry, geography and history were offered as individual subjects and awarded individual grades; and information technology was introduced as a secondary specialism. Finally, the grade awarded for the Baccalaureate essay now counts towards a student passing the Baccalaureate. These partially revised MAR rules were designed to take into account concerns regarding the lack of emphasis on natural sciences and the Baccalaureate essay *(Oelkers, 2008)*.

Long-term and short-term Baccalaureate schools

All in all, it takes at least 12 years of schooling at primary, lower-secondary and upper-secondary level to obtain a Baccalaureate, with the final four years being devoted to a Baccalaureate programme and with it being possible for the first of these four years to take place at lower-secondary level (MAR 95, Art. 6). Here, it is important to draw a distinction between Baccalaureate schools that last for six years (two years at lower-secondary level and four years at upper-secondary level), i.e. *Langzeitgymnasien*, and Baccalaureate schools that last for only four years (all of which take place at upper-secondary school), i.e. *Kurzzeitgymnasien*. In the first type of Baccalaureate school, students enter upon completion of primary school. In the second type, students enter upon completion of Year 8 or Year 9 of lower secondary education.

Long-term Baccalaureate schools are not to be found in any of the cantons in the French, Italian, or Romansh-speaking parts of Switzerland but have been available in eleven German-speaking cantons for quite some time: in ten cantons in Central and Eastern Switzerland (Lucerne, Nidwalden, Obwalden, Uri, Zug and Appenzell Innerrhoden, Glarus, Graubünden, St. Gallen and Zurich) and also in the Canton of Solothurn (up until 2011). Three cantons (Nidwalden, Obwalden and Uri) provide only long-term Baccalaureate schools. Transfers from lower-secondary school to Year 3 of the long-term Baccalaureate school are possible but are extremely rare. This means that, for students wishing to transfer from a later stage of lower-secondary education to a Baccalaureate school, the alternative option that is frequently taken up is to enrol in a short-term Baccalaureate school in a neighbouring canton. Without this de facto second transfer option from Year 8 of lower-secondary education to a Baccalaureate school, the proportion of students obtaining the Baccalaureate would be relatively low in those cantons that have only long-term Baccalaureate schools. While long-term Baccalaureate schools are not provided in every locality in the Cantons of Zurich (24 Baccalaureate schools), Lucerne (9 Baccalaureate schools) and St. Gallen (8 Baccalaureate schools), there is nonetheless a trend towards early entry to Baccalaureate schools in these cantons. In the Cantons of Zurich and Solothurn, there have been more admissions to long-term Baccalaureate schools than to short-term Baccalaureate schools for some years now. In the Cantons of Zug, Lucerne and Glarus, there are twice as many classes in long-term Baccalaureate schools as there are in short-term ones but, precisely in the Cantons of Lucerne and Zug, the trend is towards short-term Baccalaureate schools.

Admission to Baccalaureate schools

The criteria and procedures applied for admission to Baccalaureate schools differ considerably from canton to canton. In simplified terms, a distinction can be drawn between three types (→ Figure 82). It is generally students from the highest-ability groups who are considered for admission. One exception to this is the Canton of Basel-Landschaft, where students from middle-ability groups with a high grade average are also considered. Admission-procedure categories A and B are found in 14 cantons. With these two categories, it is the student's ability group or teacher's recommendation that determine

In most cantons, the **direct educational pathway** from Year 1 of primary school to the Baccalaureate takes the specified minimum of 12 years. In six cantons, however, this process usually takes longer (13 years in the Cantons of Aargau, Fribourg, Geneva, Ticino and Valais and 12.5 years in the Canton of Basel-Landschaft). The Canton of Ticino is the only Swiss canton where children enrol in primary school one year earlier. This means that, despite having 13 years of education, they still obtain their Baccalaureate at the same age as students in most other Swiss cantons.

whether he/she will be able to enrol in a Baccalaureate school. Admission-procedure category C can be found in 12 cantons. With this category, the receiving Baccalaureate school also plays a part in the selection process by requiring students to sit an entrance examination. By applying long probationary periods or promotion intervals of differing lengths, the Baccalaureate schools are also in a position to confirm or rectify transfer decisions. It is difficult to draw a correlation between the nature of admission procedures and the proportion of students who obtain the Baccalaureate, even though it has to be said that the cantons of Western Switzerland and the Canton of Ticino, which apply the Category A admission procedure, have an above-average proportion of Baccalaureate holders. The German-speaking cantons, by contrast, which account for most of the cantons with a low proportion, apply the Category C admission procedures in most cases.

Two new initiatives are now being tried out in the admission procedures for Zurich (one for long-term and one for short-term Baccalaureate schools) and, if deemed suitable, will be introduced with the second one being the first initiative of its kind anywhere in Switzerland. The first initiative has been for all Baccalaureate schools in the Canton of Zurich to use the same standardised written entrance examination instead of the previous non-standardised ones for each school. Other cantons have already introduced this measure. The second initiative has been for Baccalaureate schools to have prospective students take a cognitive skills test, which is intended to identify students who have the potential to attend a Baccalaureate school but who might fail the standardised written entrance examination for a variety of reasons. The cognitive skills test was used in Switzerland for the first time in relation to an admission procedure in 2008 and, on that occasion, approximately 7% of eligible students failed the standardised entrance examination but were among the top 30% on the cognitive skills test. The cognitive skills test therefore would have improved their chances of gaining admission. This group of students included an above-average proportion of boys. It is not possible to track the subsequent career of these candidates (to see whether or not they have successfully completed their probationary period) because they were not admitted to the long-term Baccalaureate school. While successful completion of the probationary period (from August to the end of November) can actually be predicted on the basis of a high result in the cognitive skills test, it can be predicted much more accurately on the basis of academic achievement and examination grades *(Moser, Keller & Zimmermann, 2009)*. Whether or not the cognitive skills test is to be included in admission procedures or whether it can be provided to schools as a means of confirming the potential of individual students will not be decided until after the second pilot phase has been completed.

82 **Three admission procedure categories for short-term Baccalaureate schools, simplified version (as of 2009)**

Data: IDES, Research: SCCRE

Admission-procedure category	EDK East	BKZ	NW EDK	CIIP SR+TI	Total
Category A: Admission based on student's school mark average in lower-secondary school, or on promotion to *Progymnasium* level. In case of non-admission, parents can/may demand an entrance examination.			BL	FR, JU, NE, TI, VD	6
Category B: Admission based on student's overall school marks in lower-secondary school plus recommendation by teacher. In several cantons, in case of non-admission, parents can/may demand an entrance examination.		LU, NW, OW, UR, ZG	BE, BS	GE	8
Category C: Entrance examination and/or overall school marks in lower-secondary school and/or recommendation by teacher	AI, AR, GL, GR, SG, SH, TG, ZH	SZ	AG, SO	VS	12

Admission-procedure categories: «simplified» means that admission procedure categories include only the main features, leaving out many minor details. It is often quite difficult to assign the various admission procedures used in each canton to a specific category. This can be seen in several cases. One example: the admission procedure used in the Canton of Zug, for instance, has been assigned to Category B, because all students who obtain an overall mark of 5.2 or higher are admitted. However, all students who obtain an overall mark of at least 4.8 may take an entrance examination. This combination of options would actually place the procedure under the Type C category. Two additional examples: the procedure in the Canton of Aargau has been placed in the Type C category, because students completing the *Bezirksschule* (which prepares for Baccalaureate school) are admitted if they pass the final examination, which counts as an entrance examination. In the Canton of Appenzell Innerrhoden, comparative and centrally-assessed tests are used throughout the school year, which places the procedure in the Type C category.

The range of subjects on offer also differs from canton to canton

In accordance with MAR 95, there are seven compulsory Baccalaureate subjects, one freely chosen main specialism and one freely chosen secondary specialism. The main specialism must be selected from among the following subjects or groups of subjects: a) classical languages (Latin and/or Greek); b) a modern language (a third national language, English, Spanish or Russian); c) physics and applied mathematics; d) biology and chemistry; e) economics and law; f) philosophy/education/psychology; g) creative arts; h) music.

The cantons are responsible for determining which subjects are offered. Physics and applied mathematics is the only specialism offered in all cantons. Students in five small cantons (Appenzell Innerrhoden, Glarus, Obwalden, Nidwalden and Uri), each of which has only one public Baccalaureate school, have a very limited choice of subjects (see *Ramseier, Allraum, Stalder et al., 2004*). These particular cantons generally allow students to attend a Baccalaureate school outside of the canton if a given specialism is not offered locally.

The range of available choices also varies within the individual cantons, however, depending on the size of the Baccalaureate school in question. Most small schools offer a narrower range of specialisms, while larger schools offer a wider range of subjects. There is not a single Baccalaureate school in Switzerland that actually offers all 13 specialisms. A number of big Baccalaureate schools in four cantons (Basel-Landschaft, Geneva, Vaud and Zurich) offer a maximum of 12 specialisms.

Three specialism groups, namely philosophy/education/psychology, creative arts and music, which have only been Baccalaureate specialisms since the MAR 95 reform, are distributed very unequally across the cantons (→ Figure 83). Philosophy/education/psychology is offered in only 49 Baccalaureate schools in 12 cantons, including 16 of the 21 Baccalaureate schools in the Canton of Bern. In the Canton of Bern, this heavy concentration of philosophy/education/psychology can be explained by the fact that when

upper-secondary teacher training colleges that used to train primary and lower-secondary school teachers, were phased out in favour of universities of teacher education, Baccalaureate schools focusing on philosophy/education/psychology were created as an alternative. In addition to the Canton of Bern, seven other cantons now offer philosophy/education/psychology as a compensatory measure for their discontinued teacher training schools. Eight cantons (Fribourg, Graubünden, Jura, St. Gallen, Schaffhausen, Solothurn, Ticino and Zug), which also previously ran teacher training schools, did not, however, follow suit.

More than half of all Baccalaureate schools in Switzerland offer creative arts or music as a specialism. Only two or three small cantons do not offer these subjects; and, in the Canton of Ticino, these subjects are not offered as specialisms at all. The results of the EVAMAR II tests show that students taking these three subjects as their specialisms achieved comparatively poor scores in the school language tests and especially in the mathematics tests (→ *Effectiveness, page 128*).

83 **Cantonal distribution of schools offering philosophy/education/psychology, creative arts, and music at Baccalaureate schools (as of 2010)**

This table does not include the six cantonal Baccalaureate schools for adults that prepare students for the Baccalaureate.

Data: FSO

Canton	Total number of Baccalaureate schools	Philosophy, education, psychology	Creative arts	Music
Zurich	24	1	11	12
Bern	21	16	11	11
Lucerne	9	4	6	6
Uri	1	0	1	1
Schwyz	5	2	3	3
Obwalden	3	1	0	0
Nidwalden	1	0	1	0
Glarus	1	0	1	1
Zug	4	0	3	3
Fribourg	4	0	3	2
Solothurn	2	0	2	2
Basel-Stadt	6	1	3	3
Basel-Landschaft	5	0	5	4
Schaffhausen	1	0	1	1
Appenzell Ausserrhoden	1	0	1	1
Appenzell Innerrhoden	1	1	0	0
St. Gallen	8	1	5	5
Graubünden	8	1	4	4
Aargau	6	6	6	5
Thurgau	4	2	2	2
Ticino	6	0	0	0
Vaud	10	9	8	5
Valais	4	2	3	2

Canton	Total number of Baccalaureate schools	Philosophy, education, psychology	Creative arts	Music
Neuchâtel	3	3	3	2
Geneva	12	0	9	5
Jura	2	0	2	2
Total	151	49	93	81

Effectiveness

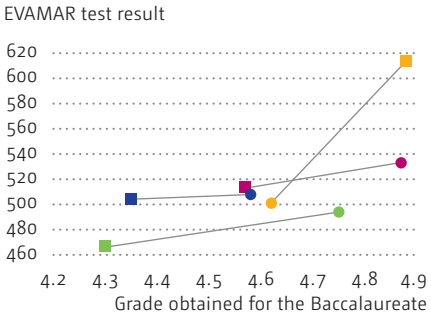
Assessing the effectiveness of Baccalaureate schools is easier than for other levels within the education system, since clear objectives (see MAR 95) have already been set out for them. The educational objective of Baccalaureate schools is to provide a broad-based, balanced and coherent education so as to prepare students for university studies and equip them to perform challenging tasks in society (MAR, Article 5). Within the core curriculum, this objective is subdivided into general objectives and learning disciplines or into subject and interdisciplinary skills. Curricula at cantonal or school level specify the content and learning objectives in greater detail. Achieving the Baccalaureate certifies that a student has achieved the educational objective and that he/she is eligible for admission to a course at a conventional university or a university of applied sciences and will be able to meet the demands of this course. This standard may be used as the basis for determining whether objectives have been reached and whether a Baccalaureate school has effectively fulfilled its mandate and for verifying this empirically. The fact that Swiss university institutions are obliged to recognise Baccalaureates issued by Swiss Baccalaureate schools as proof of eligibility for admission, however, actually makes it more difficult to identify the extent to which a Baccalaureate school has achieved its objective. It is thus necessary to be cautious when observing transition rates to university as indicators of an effective education at Baccalaureate school. In measuring a Baccalaureate school's effectiveness it is, of course, possible to extend this measurement by indicators relating to success in university studies. However, as students progress through their degree programme, the causal proximity to Baccalaureate school education decreases, on the one hand, and it cannot be guaranteed that university institutions do not adapt themselves to the quality of Baccalaureate schools over time, on the other.

EVAMAR II: Gaps in suitability for further study

In the Baccalaureate year 2007, Baccalaureate school students from all over Switzerland were tested in their first language, mathematics and biology as part of the EVAMAR II project. The EVAMAR II test scores were then compared with the Baccalaureate grades and the written Baccalaureate examinations. The Baccalaureate essays were also examined. The main findings *(Eberle, Gehrer, Jaggi et al., 2008)* revealed substantial differences between individual students, classes, examinations, specialisms and schools. In the

84 **Comparison of EVAMAR test scores and grade obtained for the Baccalaureate for languages and mathematics, by specialism, 2008**

Data: *Eberle, Gehrer, Jaggi et. al., 2008*



There is a 37-point difference between the EVAMAR mathematics scores obtained by upper-secondary level students specialising in music and those specialising in biology/chemistry but only a 0.05-point difference in the mark obtained for the Baccalaureate. For all students in the various specialisms considered (including those not mentioned here), the mathematics marks and points were lower than for language. One exception is mathematics as a specialism, where mathematics is in top position in terms of both marks and points. For virtually the same point values (a difference of 6 points) for the two subjects tested for students specialising in biology/chemistry, the mark obtained differs by 0.23.

three subjects tested, the best classes answered two to three times as many questions correctly as those that performed least well. Twenty-four percent of those who obtained their Baccalaureate had achieved an unsatisfactory grade in mathematics (Grade < 4) but 41% of students taking the Baccalaureate examination achieved an unsatisfactory grade in the written mathematics examination, which they were able to compensate for with their school marks. Baccalaureate holders from cantons with a low proportion of Baccalaureate holders did better in the EVAMAR II test on average than those from cantons with a high proportion of Baccalaureate holders. Baccalaureate students specialising in «physics and mathematics» and «classical languages» achieved the highest scores while students specialising in «music», «creative arts» and «philosophy/education/psychology» achieved the lowest scores. The grades achieved in the Baccalaureate examination corresponded only partly to EVAMAR II test results (→ Figure 84).

In the case of individual students, the Baccalaureate certificate and the grade obtained, and also additional marks, are the sole quantitative feedback that would seem appropriate for permitting a comparison. If grades are imprecise and subject to systematic inconsistencies that do not depend on academic achievement, yet are the sole information criteria for academic achievement in individual subjects, then the choice of a course of study at university is based on a distorted performance measure which is a function of the specialism taken.

Although a number of other structural parameters, such as long-term or short-term Baccalaureate schools, may have influenced the average EVAMAR II test scores, the bivariate correlations that are available do not permit any causal relationship to be established between these parameters and EVAMAR II test scores. This is due, on the one hand, to the fact that the cross-sectional nature of the performance measurement means that no selection effects can be identified and, on the other hand, to the fact that some cantons only provide specific types of Baccalaureate school, which means that there is no variation in structural parameters. In these latter cantons, it is not possible to distinguish the possible underlying causes that would explain the differences in EVAMAR II test scores. In cantons with both long-term and short-term Baccalaureate schools, we can assume that students will generally have been selected on the basis of their ability and allocated to one type of school or the other. It is therefore not clear whether the differences in performance can be attributed to the original selection that took place or to the type of school (long-term or short-term). The second reason for the lack of information value in respect of structural effects is that some cantons only offer one type of Baccalaureate school and hence, with the low number of cantons observed, it is impossible to tell whether one is measuring differences between individual cantons or between individual models.

The fact that students from different classes, schools and specialisms do not perform equally well is to be expected, and the major fluctuations in performance by those receiving an identical qualification – certifying their readiness to pursue university studies – are also not a problem. The results will only be problematic if too many candidates achieve unsatisfactory results in the Baccalaureate examination in subjects that are important for successful studies, yet are still awarded the Baccalaureate. In order to investigate this point in greater depth, EVAMAR II conducted an additional sub-project to determine the viewpoints of the receiving university institutions.

Approximately 140 teaching staff at universities in the German-speaking region of Switzerland ranked the importance of individual subjects for ensuring success in university studies. The average importance attached to individual subjects is as follows: German, English, IT-user knowledge and mathematics. When questioned about gaps in the knowledge of incoming students, the most frequently mentioned aspects were knowledge of the first language (mastery of the language) and mathematics. As far as interdisciplinary skills are concerned, the «ability to express oneself in writing», the «ability to think critically», and the «ability to work and learn independently» were the gaps most commonly referred to. The skills requirements for degree programmes vary substantially from one field of study to another. Gaps in knowledge and skills can thus constitute a hindrance and limit a student's choice of study (→ *Equity, page 135*).

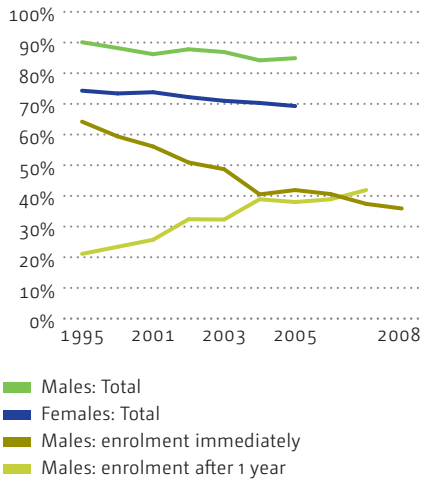
The transition from Baccalaureate schools to university institutions

Slightly over 75% of the students who obtained their Baccalaureate in 2005 enrolled in a Bachelor's degree programme at a conventional university within two years of obtaining their Baccalaureate (→ Figure 85). This proportion has been falling slightly for a number of years now. However, if we consider the 7.7% of students who enrolled in a Bachelor's degree programme at a university of teacher education and the 7.9% who enrolled in a Bachelor's degree programme at a university of applied sciences, we find that roughly 90% of all Baccalaureate holders had enrolled on a university course within two years of graduation *(FSO, 2008i)*. The slight drop in enrolments at conventional universities can, for the most part, be explained by the increases in the number of students pursuing their studies at other universities now. Though educational policymakers have not identified a specific percentage for the transition from Baccalaureate schools to all the different types of university, a transition rate of 90% can certainly be regarded as good.

The number of male students enrolling in a university immediately after obtaining their Baccalaureate has fallen considerably, however. There are many reasons for this. Increasingly, military service can no longer be reconciled with Bologna-style study plans from the time angle. The starting date for university degree programmes has been brought forward, the duration of Baccalaureate-school studies has been reduced and Baccalaureate examinations have been rescheduled to take place in the summer instead of the spring, which leaves very little time between graduation and commencement of university studies. According to the «Benchmarking» project carried out by EDK North West Switzerland, 71% of male Baccalaureate holders from six cantons (i.e. 58% of all Baccalaureate holders) took a gap year *(NW EDK, 2008)*. The reasons given for this were as follows (multiple reasons were possible): 48% military service, 14% traineeship, 28% travel, 20% language learning, 47% part-time job/earning money, 3% employment in desired occupation, 8% other *(NW EDK, 2008)*. The lower proportion of female students enrolling in conventional universities can be explained almost entirely by the fact that female students more frequently enrol in degree programmes leading to careers in education, health care and social work at universities of teacher education or universities of applied sciences.

85 **Proportion of Baccalaureate holders who enrol in a university, 1995–2008**

Data: FSO

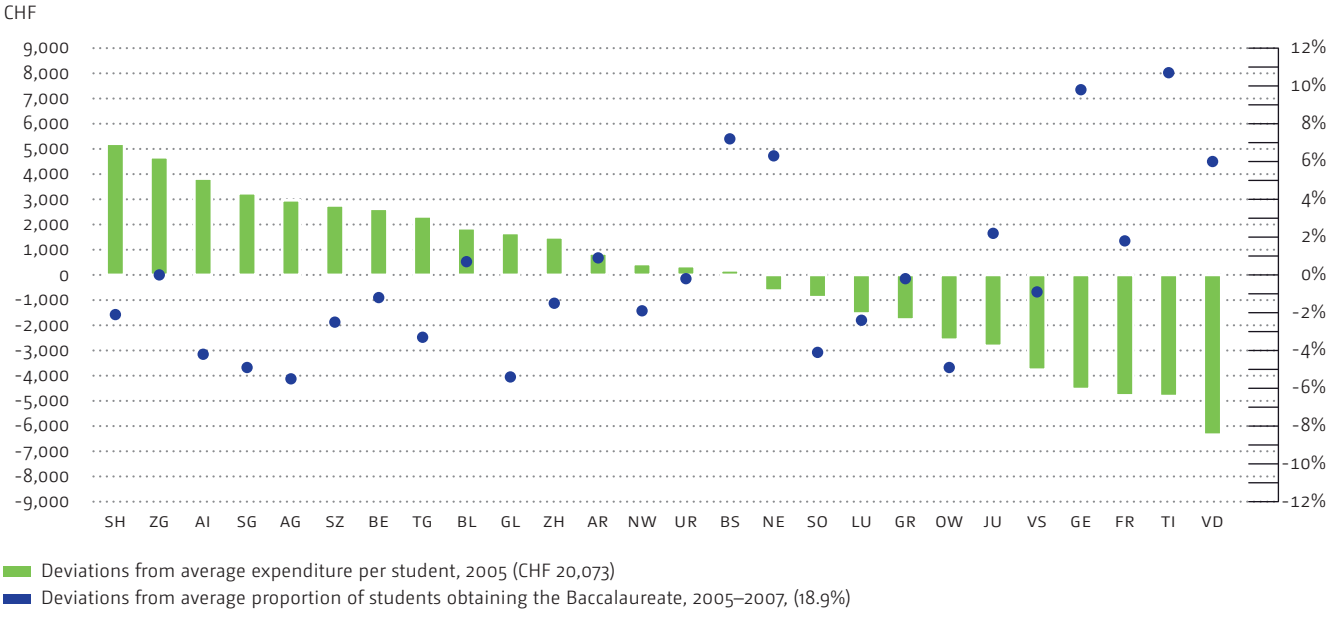


Efficiency/Costs

As is the case at all levels within the education system, assessing the efficiency of education provided at Baccalaureate schools is a difficult undertaking for a variety of reasons. There are three main problems that come into play. The rate of students progressing to universities could only be used as a measure of effectiveness if the differences that exist between individual cantons, Baccalaureate schools and forms of education were the causal effects of different investment levels. In most cases, however, this criterion cannot be fulfilled, since the self-selection of students into specific types of education, and especially into Baccalaureate schools, leads to different preconditions for the performance of the individual schools themselves. In addition, with regard to the other effectiveness criteria, it is difficult to establish either a direct causal link or a time-based causal link with individual inputs. Finally, both the educational inputs and the education processes themselves are lacking reference values and experimental variations that would permit the assessment of input/output correlations. In most cases, experimental, as opposed to natural, changes in education inputs and processes are needed for assessing effectiveness, and hence efficiency too, since only experimental variations can be observed in a controlled environment which is comparable for all the schools and cantons being compared. Natural variations mostly include a range of other parameters which, while playing a decisive role in the assessment of effectiveness/efficiency, are different (and cannot be observed). Generally speaking, variations that are not due to experimental interventions can only provide information that is subject to excessively high limitations.

86 **Deviations from average cantonal expenditure per student (2005) and deviations from the average proportion of students obtaining the Baccalaureate (2005–2007)**

Data: FSO



Annual expenditure varies

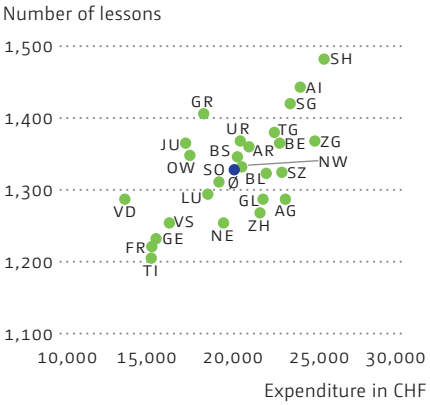
Leaving aside the problems of attributing outputs to inputs and of defining the outputs, i.e. everything relating to effectiveness, we can at least observe on the input side that investment in a Baccalaureate education varies greatly from one canton to another (→ Figure 86). Generally speaking, there was no indication that cantons with a relatively small proportion of Baccalaureate holders had more scope for relatively high annual expenditure per student. At least as far as the German-speaking region is concerned, no correlation can be observed between the proportion of students obtaining the Baccalaureate and the annual expenditure per student. If we compare the German-speaking region with the French, Italian and Romansh-speaking regions, excluding the Cantons of Basel-Stadt and Ticino, where the proportion of Baccalaureate holders is at odds with the rest of the country, then we find that the proportion of students obtaining the Baccalaureate in Western Switzerland (which is above the average rate for Switzerland as a whole) is associated with below-average expenditure per student.

In some cases, the difference in annual expenditure between the cantons is enormous. The gap that exists between the «most expensive» and the «least expensive» canton equates to almost 60% of the average cost of a Baccalaureate education. What is more, the differences occur on an annual basis. In other words, if we extrapolate this expenditure per student to include the entire duration of Baccalaureate school studies, we nearly reach six-digit figures.

Although we may have a number of ideas as to why such differences exist, there is no simple explanation. A correlation drawn between high expenditure and high wage levels, or vice versa, can only be confirmed in the case of a few cantons. Zug pays the second-highest wages, and its expenses are also the second-highest. Vaud, like all of the cantons of the French-speaking region, pays the lowest salaries and also spends the least. Standard class sizes are also unsuitable as a means of comparison, since these are only specified in 15 cantons. These 15 cantons include Zug, Solothurn and Thurgau (which apply standard class sizes of 18 and 20), which pay good to very good salaries. Despite this, the annual expenditure in these 15 cantons differs substantially and, in the case of Solothurn, is even below-average. The only variable that correlates in a measurable manner with expenditure is the number of lessons per year. Three of the four cantons with the highest expenditure (Appenzell Innerrhoden, St. Gallen and Schaffhausen) also delivered the highest number of lessons per year: each of these three provide over 1,420 lessons per year. The average number of lessons for Switzerland as a whole is 1,328 lessons per year (→ Figure 87).

87 **Cantonal expenditure on Baccalaureate schools (2005) and annual number of lessons (2008)**

Data: IDES, FSO

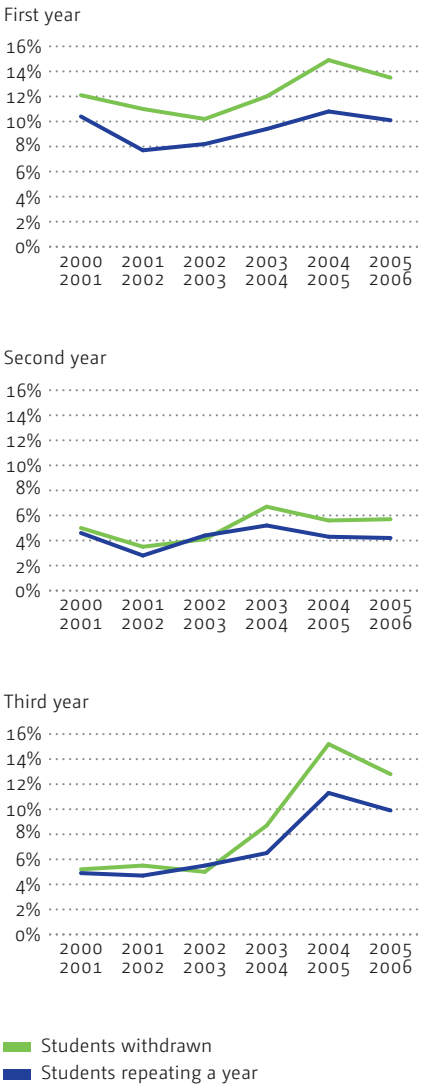


Interruptions in education as a measure of efficiency, using the Canton of Vaud as an example

Having a student repeat a school year or withdrawing a student from an educational institution are measures that seek to address a discrepancy between the student's performance and the requirements of the educational institution he/she is attending. From an efficiency standpoint, however, these measures must be regarded as less than ideal decisions, since they tend to generate high social, taxation and individual costs. In other words, it would

88 **Proportion of students repeating a year or withdrawing from three-year Baccalaureate schools in the Canton of Vaud, 2000/1–2005/6**

Data: *Stocker, 2006*



be more efficient to prevent such a discrepancy from arising in the first place by carefully selecting the students and providing the necessary support measures as they progress through school.

A study of the educational paths of students attending Baccalaureate schools in the Canton of Vaud between 1995 and 2005 is associated with the new regulations on student progression in this context *(Stocker, 2006)*, which highlighted an interesting efficiency problem. Between 35% and 38% of lower-secondary students in the Canton of Vaud go on to obtain their upper-secondary Baccalaureate. Compared to Switzerland as a whole, this proportion is above-average.

If we examine the figures over a period of several years (→ Figure 88), we find that the number of students who were not admitted to the following year and thus repeated a year was considerably higher during the first year of Baccalaureate school than in the two subsequent years. From the 2001/2 academic year onwards, a change in the promotion policy was introduced, removing the requirement to doubly compensate for end-of-year grades below 4. Although the result of this was to make progression to the next year simpler overall, the number of students that were not moved up to the next year during the first two years of Baccalaureate school did not fall after this (but Baccalaureate school studies did become slightly more attractive, as was borne out by the rise in the proportion of students obtaining the Baccalaureate). By contrast, the number of students who were not promoted rose rapidly during the final year of Baccalaureate school. On account of the cross-sectional data, it is not possible to say whether this was due to an increasing number of students being kept on to the final year who, under the previous regulations, would have left the class due to not being promoted, or whether more students who repeated a year now took the Baccalaureate. It is clear, however that in the final year of Baccalaureate school, a new phenomenon arose that seemingly did not exist in the past. Prior to 2003, almost all Baccalaureate school students who had not passed the Baccalaureate examination repeated a year (whether or not they had a chance of achieving the qualification cannot be determined). After 2003, the number of those repeating the final year was significantly lower than the number of those who did not pass the Baccalaureate examination. The easing of the promotion rules seems to have created a situation where the failure rate now manifests itself primarily in the final year of Baccalaureate school. Moreover, there has been a significant increase in the number of students who fail to pass the Baccalaureate examination on their first attempt and leave the Baccalaureate school without obtaining their Baccalaureate. From an efficiency standpoint, therefore, the current situation is certainly less favourable than the one that existed prior to 2003.

Total duration of education and test scores

The Third International Mathematics and Science Study (TIMSS) project also analysed mathematics skills among students in the final year of Baccalaureate schools in Switzerland (data compiled in 1995). To establish technical efficiency, the project also examined the correlation between performance in mathematics and the number of mathematics lessons provided up to the time when students take the Baccalaureate examination. No difference in performance was established between cantons with different dura-

tions of education (12, 12.5 or 13 years). However, the difference in the average number of mathematics and physics lessons from Year 10 onwards in the type-C programme (average of 24.9 lessons) as well as in the type A, B, D and E programmes (average of 13.9 lessons) certainly had an impact on average test scores *(Ramseier, Keller & Moser, 1999)*. That having being said, it is, nonetheless, difficult to say that the positive correlation can be explained by the number of lessons, since Baccalaureate school students who perform better in mathematics actually elected to be on the type-C programme themselves.

The results of the EVAMAR II assessment show that the choice of mathematics as a specialism and the fact that students will therefore receive a higher number of lessons in mathematics results in significantly higher average test scores (> 600 points) than those achieved by students whose specialism is classical languages or biology/chemistry, who obtain the next highest results. In mathematics, these students' test scores were a good 100 points lower (→ Figure 84).

Equity

Equity in Baccalaureate schools, not only upon entry but also within the year group and in the transition to the tertiary sector, is a subject that requires closer examination. Data from both the PISA and EVAMAR II assessments can be used to conduct an empirical statistical analysis of equity. The primary focus is placed on inequities relating to gender or social origin.

As far as admission to Baccalaureate schools (→ *Institutions, page 124*) is concerned, the primary and secondary effects of educational disparities are relevant. The former include the socio-economic and cultural background of students, as these have a direct impact on academic achievement. If we analyse the PISA 2006 test scores on the basis of social background, i.e. comparing the background of students who attended Baccalaureate school in Year 9 with the average social background of all lower-secondary students in the same canton, we find a disproportionately high number of students from a privileged socio-economic background enrolled in Baccalaureate schools in Year 9 (→ Figure 89). In cantons that have lower-secondary preparatory schools for students wishing to enrol in upper-secondary Baccalaureate schools, there is a more balanced distribution in terms of social background in Year 9. The likelihood of a student from a disadvantaged social background attending a preparatory school in Year 9 is higher than the likelihood of such a student attending a Baccalaureate school. In this regard, whether there are preparatory schools or only Baccalaureate schools in a canton is important, since admission rates to preparatory schools and Baccalaureate schools are different: preparatory schools tend to take 30–40% of all Year 9 students, whereas Baccalaureate schools that begin in Year 9 tend to take only about 20% of all Year 9 students.

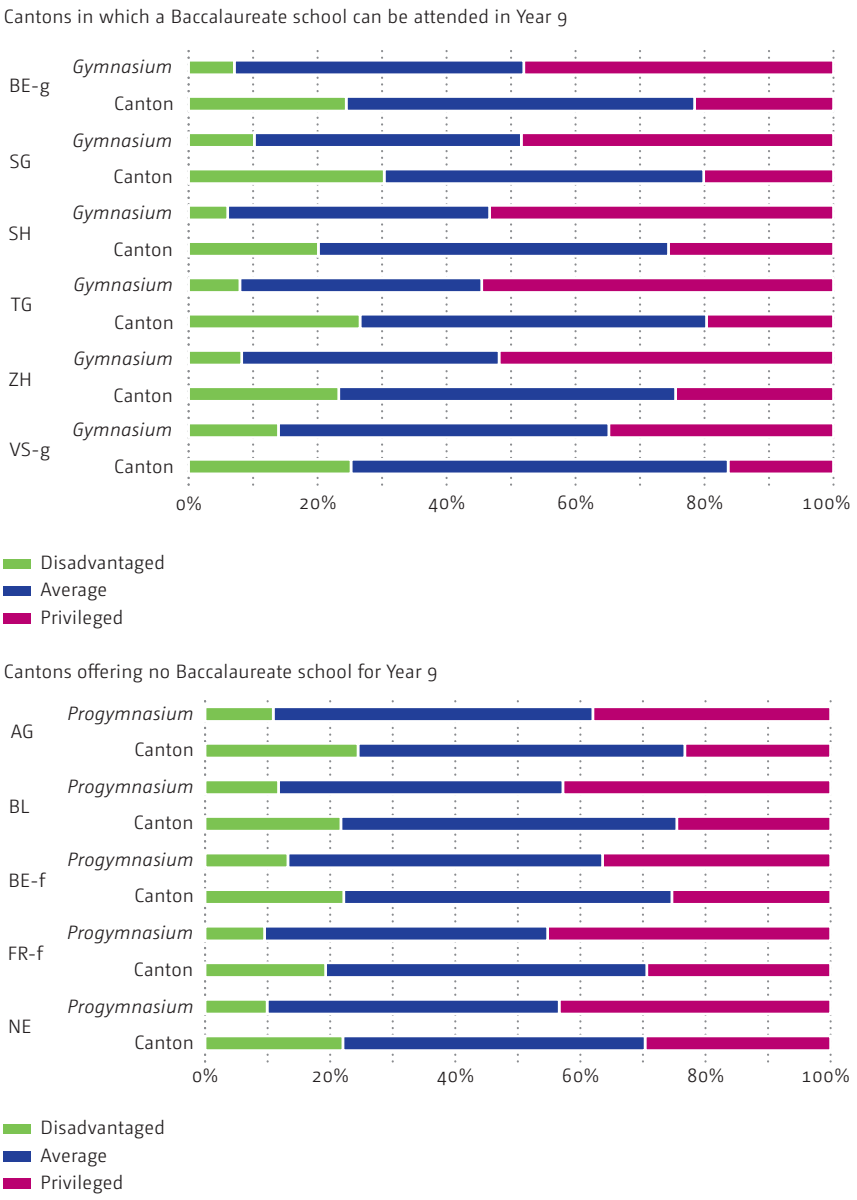
The secondary effect of educational disparities can be seen from the fact that even if students from low socio-economic backgrounds have the same level of academic achievement, they are under-represented in preparatory schools as well as in Baccalaureate schools that start in Year 9. If, for comparative purposes, we take only those students who achieved the highest PISA

Educational disparities refer to differences in education that exist between different social groups and are the result of primary and secondary effects (cf. *Boudon, 1974*). The **primary effects** refer to socialisation conditions in the parental home which, for the same conditions at school, may lead to different levels of academic performance. **Secondary effects** refer to socialisation conditions which, all academic performance levels being equal, will affect a student's education choices later on.

89 **The social origin of students in Year 9**

Data: *FSO/EDK, 2007;* calculations: SCCRE

Only those cantons with an extended random sample as part of the PISA 2006 assessment are included here. Example: In the Canton of Zurich, approximately 25% of all lower-secondary school students come from a privileged socio-economic background. However, approximately 52% of all students attending a Baccalaureate school in Year 9 come from a privileged socio-economic background.



test scores (5 and 6) in 2006, we find that, despite equivalent performances in a given subject, a student's social origin significantly increases or reduces the likelihood that he/she will attend a Baccalaureate school (→ Figure 90). While 28% of students with very high PISA test scores in mathematics but from a disadvantaged socio-economic background attend Year 9 of a Baccalaureate school, the figure is more than 68% for children from socio-economically privileged families. Similar disparities can also be seen in the case of PISA test scores in reading and natural sciences, and these disparities are statistically significant, even taking account of other influences. This does not necessarily mean, however, that students from more disadvantaged socio-economic backgrounds are suffering discrimination. The differences could be

the result of personal preferences, attitudes or parental expectations. Nevertheless, it is astonishing in terms of the recruitment practice of the Baccalaureate schools that not even half of the socially disadvantaged students who achieve above-average test scores attend a Baccalaureate school.

Performance and the proportion of Baccalaureate holders in each canton

Research on EVAMAR II test scores has shown that in those cantons where a high proportion of students obtain the Baccalaureate, the average EVAMAR II test scores in the subjects tested are significantly lower than in those cantons where a lower proportion of students obtain the Baccalaureate *(Eberle, Gehrer, Jaggi et al., 2008)*. In other words, it would seem that it is easier to obtain a Baccalaureate based on modest academic performance in those cantons where a high proportion of students obtain the Baccalaureate. Put the other way round, it is not equally probable that a student with the same level of academic achievement will receive the Baccalaureate in all the different cantons. Differences between the individual cantons with regard to the proportion of Baccalaureate holders are not therefore a result of differences in the academic achievement of the students in each canton. The extent to which students who obtain an «easier» Baccalaureate perform less well at tertiary level than students who obtain a «more difficult» Baccalaureate is impossible to determine, due to the lack of data on individual students' educational paths.

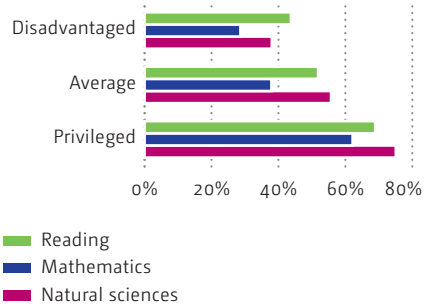
Gender distribution in Baccalaureate schools

As far as gender distribution in Baccalaureate schools is concerned, it is striking that the proportion of female Baccalaureate holders is continuing to rise, creating an ever more pronounced gender imbalance to the detriment of males. At present, the proportion of female Baccalaureate holders stands at approximately 22.8% and is significantly higher than the proportion of male Baccalaureate holders at 15.8% (→ *Context, page 122*). The gender imbalance becomes even more striking when considering the distribution across the individual specialisms in Baccalaureate schools. The new specialisms of «philosophy, education, psychology», «creative arts» and «music» are female-dominated. At the same time, the EVAMAR II test scores show that performance in these specialisms is lower than for «male-dominated» specialisms. It is currently impossible to say whether the lower level of performance in «female-dominated» specialisms can be attributed to the gender composition of classes or whether it is due to the profiles themselves. It is also equally unclear whether the lower levels of performance in individual specialisms will ultimately harm the students' further academic career or the choice of degree programmes available to them. What is certain, however, is that there is considerable segregation between male and female students at Baccalaureate schools and this is highly likely to have an impact on students' choice of degree programme.

The foregoing is mere speculation, however, since the analyses conducted thus far do not answer the question as to whether female students specialising in philosophy, education and psychology at Baccalaureate school obtain

90 **The socio-economic background of students with very high academic performance who attend Baccalaureate school in Year 9**

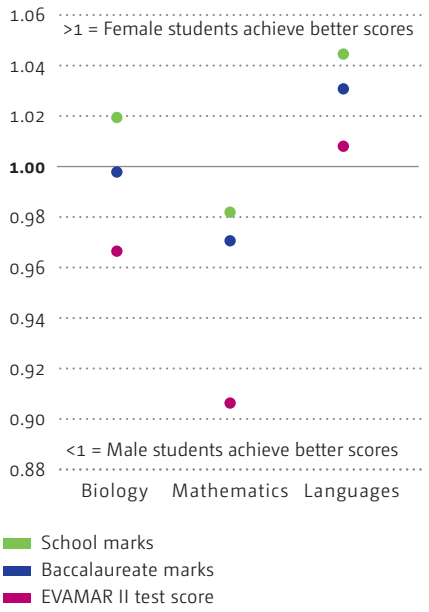
Data: *FSO/EDK, 2007;* calculations: SCCRE
For reasons of comparability, only data from the following cantons are used: Bern (German-speaking areas), St. Gallen, Schaffhausen, Thurgau, Valais (German-speaking areas), Zurich.



Example
Approximately 75% of students who have a very high academic performance in the natural sciences and who come from a privileged socio-economic background attend a baccalaureate school in Year 9. This figure is only 38% for students who have exactly the same level of academic performance but who come from a disadvantaged socio-economic background. This means that students from a lower socio-economic background are around 50% less likely to attend a Baccalaureate school in Year 9.

91 **Test performance, school marks and Baccalaureate marks, ratio of female students to male students**

Data: *Eberle, Gehrer, Jaggi et al., 2008;* calculations: SCCRE



Example

Dots situated near 1 indicate that female and male students performed equally well. Dots below 1 indicate that male students performed better. Dots above 1 indicate that female students did better. If female students generally perform better than male students (or vice-versa) in a subject, then all three values will be above 1 (languages) or below 1 (mathematics) respectively. In biology, we find that female and male students obtained more or less the same Baccalaureate grades (dot is near 1). Female students, however, had obtained better school marks than their male counterparts (dot above 1). Male students obtained a better EVAMAR II score than their female counterparts (dot below 1).

worse test scores in mathematics because they have chosen philosophy, education and psychology or whether they would have obtained the same test scores in mathematics had they chosen a different specialism (on the basis of their personal skills and aptitudes). It is also impossible to say whether the students consciously accepted the idea of not doing well in mathematics because they do not need mathematics for the degree course they have chosen at university, or whether the choice of degree course has been restricted by the expected poor performance in mathematics. Finally, it is also impossible to determine whether lower test scores in mathematics ultimately lead to limitations at university level at all, such as through poorer study results, or whether the differences are too small to have an impact of this type.

Pronounced gender differences can also be seen when comparing EVAMAR II test scores, school marks and marks in the Baccalaureate examination. Compared to school marks, female students tend to obtain lower test scores (→ Figure 91). Without in-depth analyses, it is impossible to say whether the differences are due to a different performance pattern during students' time at school (school marks), which do not necessarily reflect performance potential, or whether female students receive advantageous treatment in the award of marks in relation to their performance. Despite this, the differences between the genders do point to interesting inequity patterns.

Gender influences the choice of specialism. The assessment of the replies received from a survey of students taking the Baccalaureate examination in the subjects they intended to study at tertiary level reveals that not all choices of specialism have an equal influence on the field studied thereafter. What is more, the survey also revealed differences between the genders. Students who select a specialism that has been female-dominated for many years (languages) or male-dominated for many years (mathematics) are less likely to switch to a different subject upon entering university. Students selecting a specialism taken by a below-average number of students of the same sex are more likely to switch subjects (→ Figure 92) *(Bieri Buschor, Denzler & Keck, 2008; FSO, 2008a).*

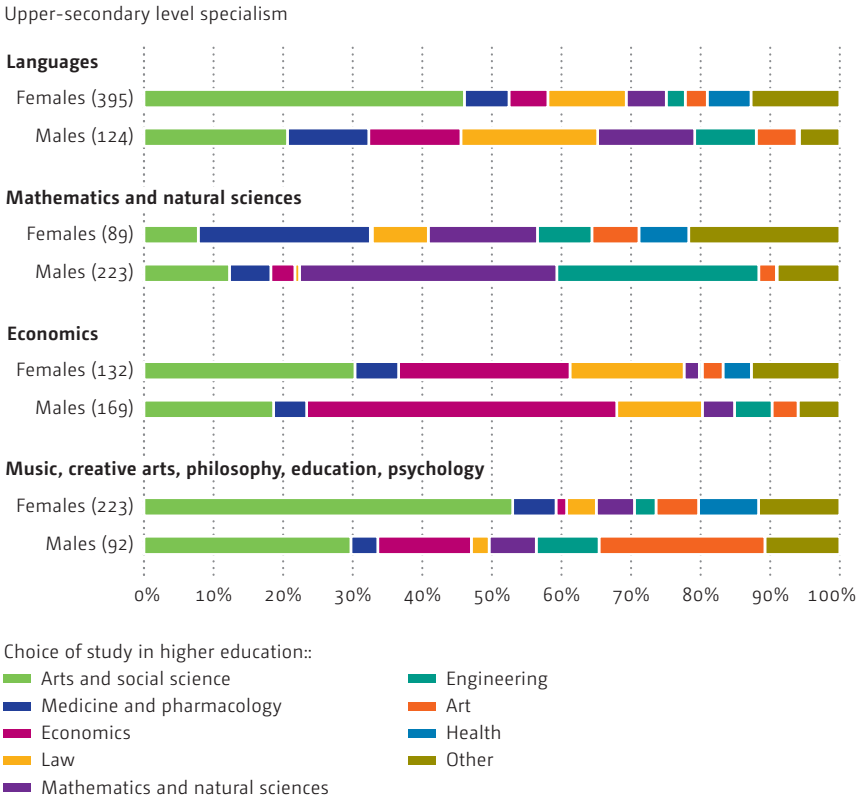
Does the specialism determine the field of study at university level?

The significant difference in EVAMAR II test scores in mathematics, biology and languages among students in different specialisms raises the question of whether all students obtaining the Baccalaureate are equally capable of studying at university level. These test scores cannot, however, be regarded as an indicator of disadvantage. If a female student chooses to specialise in mathematics and natural sciences because she wants to study chemistry later on, she would be not be overly concerned by lower test scores in languages. It may even be that the lower EVAMAR II test scores are merely a reflection of selection processes in the individual specialisms based on individual abilities, aptitudes and aspirations. This would also mean that students' skills are furthered to the same extent in all the profiles, in line with their talents, and that performance would not have been different if they had opted for a different profile. Long before going to university, the students would have been aware of the fact that, despite having a «universal» Baccalaureate, they could not take all courses at a university with the same chance of success. This situation only becomes a problem if the different test performances for

different specialisms are attributable to different degrees of support in the individual profiles, while the students are under the impression that they can enrol in any field of study at university level when they have obtained their Baccalaureate, regardless of their specialism. In such a case, a restriction on the decision as to which subject to study at university would be the consequence of a suboptimum process when selecting the specialism profile at Baccalaureate school.

92 **Comparison of upper-secondary level specialism and choice of study in higher education**

Data: *Bieri Buschor, Denzler & Keck, 2008*



Example

Among the upper-secondary level students specialising in languages, female students (N = 395; 76.1%) outnumber male students (N = 124; 23.9%). At higher education level, 46% of female students and only 21% of male students enrol in a degree programme in arts and social science. The opposite holds true for students enrolled in a degree programme in mathematics and the natural sciences. Of the 223 male students who specialised in mathematics and the natural sciences at upper-secondary level, 37% enrolled in a degree programme in the same field. By contrast, only 16% of the 89 female students did so.

Vocational education and training (VET)

Context

Unlike other sectors of the Swiss education system, upper-secondary level vocational education and training (VET) is strongly influenced by economic developments, which can affect both the profile and number of apprenticeships offered by training companies. At the same time, demographic factors also have an impact on VET programmes, leading to either an excessive or insufficient number of offers on the apprenticeship market. This is because the number of available apprenticeships depends primarily on economic demand and only to a lesser extent on the number of potential apprenticeship applicants. Finally, VET programmes are also affected by developments in upper-secondary general education as well as developments at the tertiary level. When students coming out of the lower-secondary level feel more inclined to pursue a general-education-based route at upper-secondary level, then the number of apprenticeship applicants declines. By contrast, when VET programmes at tertiary-level are considered to be more attractive (e.g. universities of applied sciences and tertiary-level B professional education and training) and when permeability exists between the various types of tertiary-level institutions, the number of apprenticeship applicants increases as does the willingness of companies to offer such apprenticeships.

Economic structural changes

The impact of constant economic structural change on the VET sector needs to be understood from two different angles: how the VET sector responds when occupational fields and economic branches disappear and how it responds when new occupational fields and economic branches emerge. Whenever an occupation disappears or demand for a specific occupation declines, there is usually a quick and clear drop in the number of available apprenticeships for that occupation (see *Schweri & Müller, 2008*). This is a positive finding, since the supply-side adjustment of the apprenticeship market effectively reduces the number of VET students learning an occupation whose skills are no longer needed on the job market. Whenever new occupations emerge, by contrast, the VET sector response time is slower since the corresponding professional organisations need to draft new VET ordinances and training plans. While the response time is slower, this should not necessarily be viewed in a negative light. For one thing, it is difficult to accurately determine quantitative and qualitative needs for new economic branches; in addition, new occupational fields often involve new companies whose limited survival prospects mean it is not always advisable for them to commit themselves to training apprentices over a number of years (an apprenticeship contract commits a company for at least two years).

Of course, the regulatory framework also has an impact on how quickly adjustments can be made within the VET sector. Regardless of how one judges the VET sector response time in general or the response time of the Confederation, the cantons and the professional organisations in particular, it is also necessary to ask what the alternative would be. No matter how incomplete the VET sector's response to economic structural changes might be, it is unlikely that the general education sector would manage them any better. It still remains to be seen whether there is a general misallocation of ap-

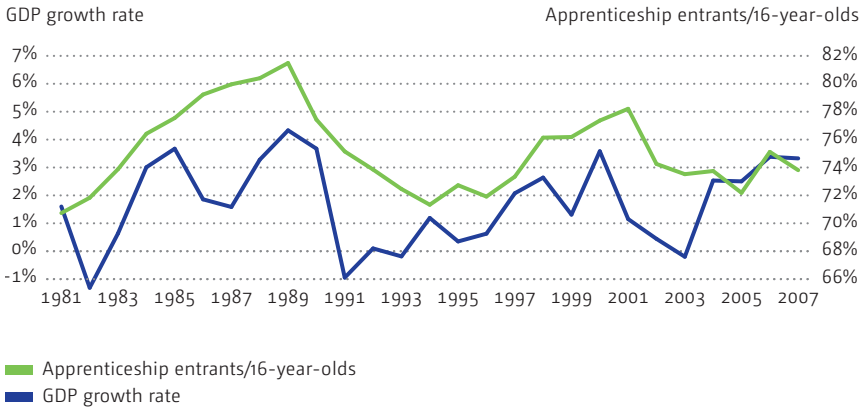
prenticeships among economic sectors, economic branches and occupations (cf. *SCCRE, 2006*). In construction and traditional services, for instance, the number of available apprenticeships has almost always exceeded the number that would be expected on the basis of the number of jobs available. In order to be able to assess the consequences of this top-heavy apprenticeship/available job ratio, we would need to know more about the occupational mobility of VET graduates during their professional career. Until this information is gathered, it can be assumed that those sectors and companies train apprentices for which training represents the most efficient solution, and that the trained specialists look for work in those sectors and companies which offer them the best working conditions and job prospects.

Economic fluctuations

The generally close correlation between dual-track VET programmes and the economic situation comes at a price in times of economic hardship. Companies are usually able to (or need to, see *Mühlemann, Wolter, Fuhrer et al., 2007*) recover their apprenticeship-related costs directly by having VET students generate output over the course of their apprenticeship. These training companies, however, find this more difficult to do with a declining order book and are therefore less willing to offer apprenticeships if their economic situation no longer makes this worthwhile. Even in the roughly one-third of cases where companies are less concerned about achieving direct profitability from apprenticeships, however, economic downturns can result in a lower number of apprenticeships being made available to VET students. In such cases, the deciding factor will be whether the training companies in question see a possibility of hiring VET graduates upon completion of their three- or four-year apprenticeship. If a prolonged economic slump is expected, this has a much more pronounced impact on demand for apprentices than if only a short cycle is expected. The negative consequences of a long-term economic slowdown were felt in the first half of the 1990s.

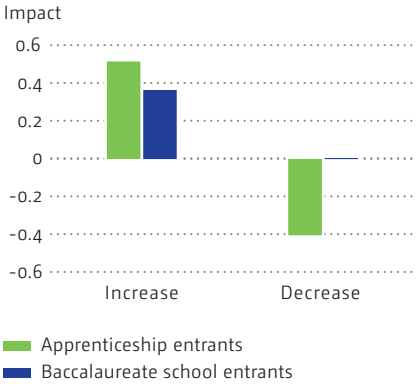
93 **Apprenticeship entrants and economic situation, 1981–2007**

Data: Swiss Federal Institute for Vocational Education and Training (SFIVET), based on data from *Schweri & Müller, 2008*



94 **Impact of a 1-person increase/ decrease in the number of compulsory school graduates on the number of apprenticeship and Baccalaureate school entrants**

Data: University of Bern, Centre for Research in Economics of Education



The number of **apprenticeship and Baccalaureate school entrants** reacts in a very different and asymmetrical manner to fluctuations in the number of compulsory school graduates (see *Wolter, 2007*). The results of empirical analysis show that, for every 1-person increase in the number of compulsory school graduates, there is a corresponding 0.5-person increase in the number of apprenticeship entrants and a 0.4-person increase in the number of Baccalaureate school entrants. Demographic growth therefore leads to a slightly under-proportional impact on the number of apprenticeship entrants and a slightly over-proportional impact on the number of Baccalaureate school entrants (a proportional impact would have been closer to the actual ratios of compulsory school graduates who become either apprenticeship entrants or Baccalaureate school entrants, i.e. a more elastic 0.65-person response in the number of apprenticeship entrants and a 0.2-person response in the number of Baccalaureate school entrants). When the number of compulsory school graduates decreases, the under-proportional response in the number of apprenticeship entrants eases pressures on the apprenticeship market. By contrast, we find that the number of

Generally speaking, economic fluctuations will have less of an impact on the willingness of companies to offer apprenticeships if the net costs of a typical apprenticeship can be kept low. Empirical analysis of new apprenticeship contracts signed over the past twenty years shows that for every percentage point increase in the Swiss unemployment rate, there has been a corresponding 0.6% decrease in the number of new apprenticeships *(Mühlemann, Wolter & Wüest, 2009)*. This means that for every percentage point increase in the unemployment rate, the number of apprenticeships decreased by roughly 450 (→ Figure 93).

Demographics

In the early 1990s and in early 2000,the Swiss apprenticeship market went through two phases in which the number of students coming out of lower-secondary level rose amid economic decline. This meant that the shortage of available apprenticeships was much greater than would normally have been the case had the number of students remained constant. The economic downturn experienced by Switzerland as of mid-2008 had not had an immediate impact on the apprenticeship market by April 2009. Since the number of students coming out of lower-secondary education is decreasing, it is hoped that this will at least partly compensate for the decline in the number of available apprenticeships. However, the situation is not likely to improve for poorly qualified students, since a large number of companies prefer to do without apprentices where applicants are poorly qualified on account of the costs of providing an apprenticeship.

Relationship to the general education sector

Over the past few years, the range of upper-secondary level programmes within the general education sector has steadily increased. This trend has mainly been observed at Swiss specialised schools and to a much lesser extent at the Baccalaureate schools and is expected to further reduce the quantitative burden on the apprenticeship market. In times of economic difficulty, this relief is desirable, as it tends to reduce the number of potential apprenticeship applicants. However, it does create two problems. Firstly, the general education sector mainly draws the high and medium-ability groups from lower-secondary level (see *SCCRE, 2006*), which generally leaves training companies with those apprenticeship applicants who have a lower average performance. Training companies begin to offer fewer apprenticeships, and the situation of poorly-performing applicants does not really improve, despite a smaller number of apprenticeship applicants overall (see, for example, *Mühlemann & Wolter, 2007*). The second problem is that, at upper-secondary level, the general education sector does not make any adjustments what-soever in relation to demographic-related reductions in the size of cohorts. When the number of students coming out of lower-secondary level in a given year decreases, the proportion of apprenticeship applicants will automatically fall as well (→ Figure 94). In its demographic scenarios for 2008–2017, the Federal Statistical Office (FSO) expects the number of students in the VET sector to decline steadily from the peak reached in 2008. At the same time, it expects the number of students in the general education

sector at upper-secondary level to remain practically constant (Baccalaureate schools) or to increase (upper-secondary specialised schools) *(FSO, 2008d)*. If these changes in upper-secondary level student figures reflect the needs of the job market, then these changes should be considered positive. However, if these changes are merely caused by different responses of the general education and VET sectors to demographic fluctuations, then Swiss education policies need to be called into question.

Baccalaureate school entrants remains roughly the same, despite a decrease in the number of compulsory school graduates. This raises the question as to what admission criteria Baccalaureate schools use, since the figures would seem to indicate that admission criteria change to accommodate demographic cycles.

Institutions

As far as the institutional management of Switzerland's VET/PET sector is concerned, mention can be made of two aspects resulting partly from the implementation of the new federal vocational and professional education and training act (SR 412.10):

According to the comparative studies conducted in the VET/PET sector for the very first time by the Organisation for Economic Cooperation and Development (OECD), Switzerland's VET/PET sector stands out in many respects, which will be discussed in subsequent sections of this report. The differences between VET structures in various countries are much greater than the differences between the general education sectors, which already display pronounced national characteristics. Since almost no VET research has been conducted on these issues, it is practically impossible to determine the impact that various VET structures have on the functioning and success of a given VET sector. It may perfectly well be that VET structures have gradually adapted themselves to the point where they are ideally suited to the national context, and particularly to the job market. It may also be, however, that the lack of comparison has prevented national VET sectors from taking advantage of the many different optimisation options.

Secondly, with the enactment of the new federal vocational and professional education and training act (2002), Switzerland has improved and considerably accelerated the process of system reform (OPET's Master Plan for the VET sector). In addition to a general revision of VET ordinances, the VET sector has experienced the further development of the Federal Vocational Baccalaureate, the creation of two-year VET programmes leading to the Federal VET Certificate and the introduction of planning instruments such as project subsidies (Art. 54/55 of the federal vocational and professional education and training act) as well as cantonal and branch-specific VET/PET funds.

Central planning and influence of professional organisations

Switzerland's VET/PET sector is a part of the education system that is not only centrally managed at the federal level, but has also long been characterised by the strong institutionalised involvement of professional organisations *(Bauder & Osterwalder, 2008)*. The overarching objective has been to ensure that VET and PET programmes are adapted to optimally match the needs of the job market. National steering by the Federal Administration ensures that VET and PET qualifications are standardised to the greatest pos-

sible extent. It is this standardisation that ensures the occupational mobility of VET and PET graduates whether this be geographically, or in different economic branches or companies. Since the VET sector is very heterogeneous (with over 200 different occupations), national solutions also ensure the best possible degree of efficiency in the preparation and implementation of VET ordinances, examinations and recognition procedures. The influence of professional organisations ensures that the content and methods used in VET and PET programmes match the needs of the job market as closely as possible, thereby ensuring the highest level of acceptance among employers. Although the influence of professional organisations is practically a fundamental feature of the VET/PET sector, this influence is very high in Switzerland compared to that in other countries. Of course, this strong influence of the professional organisations is one of the main reasons why dual-track VET programmes are generally more closely correlated to the needs of the job market than entirely school-based VET programmes. That having been said, even in countries with strong dual-track VET programmes, the professional organisations do not have such a high level of influence as that found in Switzerland.

It must not be forgotten that, in addition to the Confederation, the cantons also play an important role in the strategic planning of the VET sector in Switzerland. It is the cantons that implement the VET programmes and pay

95 **Influence of the social partners in the VET sector**

Data: OECD

	Curriculum		Work-based content		Acquired competencies	
	Decision	Counselling	Decision	Counselling	Decision	Counselling
Australia	–	–	***	***	***	–
Austria	**	***	**	***	**	***
Belgium (Flemish)	*	****	*	****	*	****
Czech Republic	–	**	–	**	–	***
Denmark	****	–	****	–	****	–
Finland	***	***	–	***	***	***
France	–	–	–	****	–	****
Germany	–	**	***	****	–	**
Hungary	–	****	–	****	–	****
Netherlands	–	****	–	–	–	****
Norway	–	****	****	–	–	****
Sweden	–	****	–	****	–	****
Switzerland	****		****		****	
Turkey	****	–	****	–	****	–
USA	–	****	*	–	****	–

The symbols show the amount of impact that the social partners have on the various programmes:
– = 0%; * = 1–25%; ** = 26–50%; *** = 51–75%; **** 76–100%

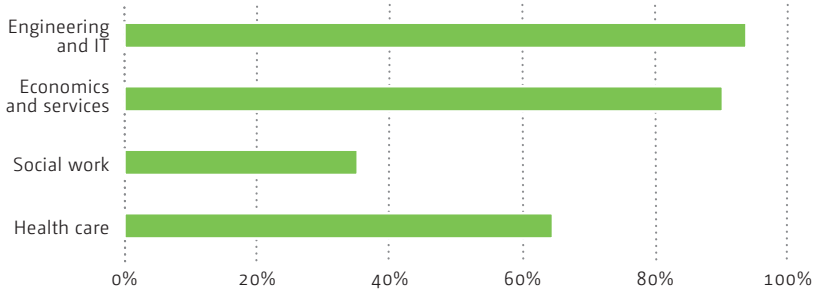
roughly four-fifths of all public expenditure devoted to the VET sector. Regional implementation by the cantons also makes it possible to adapt VET programmes to compulsory education (the so-called interface problem) and also to the other options at the upper-secondary level

Reform of the Federal Vocational Baccalaureate

Plans are currently under way to reform the Federal Vocational Baccalaureate (FVB). The Federal Vocational Baccalaureate has been a success model, leading to quantitative growth over the past decade. The FVB has also certainly made upper-secondary level VET programmes a more appealing option for those completing compulsory school. At present, over 50,000 Federal VET Diplomas and 10,000 FVBs are issued each year (FSO: qualification statistics for 2007, Internet). At present, the FVB accounts for around 38% of all baccalaureates issued in Switzerland (2007 figures). The Federal Vocational Baccalaureate differs from the Baccalaureate in many respects. It is precisely these pronounced differences in the function of the two upper-secondary level qualifications that are at the heart of the current controversy surrounding discussions on the FVB reform. While the Baccalaureate provides unrestricted access to enrolment in conventional universities, the Federal Vocational Baccalaureate is intended to provide holders with direct access to universities of applied sciences (UAS). A key difference between the two baccalaureate types is that their profiles fulfil different purposes. While Baccalaureate schools allow students to choose Baccalaureate specialisms that match their aptitudes and preferences, the different programmes have a different function. They are, firstly, determined by the apprenticeship occupation, i.e. it is not generally possible to choose the type of FVB programme; instead, this will be specified by the apprenticeship occupation. Secondly, they are coordinated with the UAS degree programme that marks the logical continuation for the chosen apprenticeship occupation. This configuration of the FVB (which is reflected in the curriculum for the profile) offers the undisputed advantage that FVB holders already have the prerequisite knowledge and skills needed for attending the corresponding UAS degree programme. The drawback to this arrangement is that the apprenticeship occupation, with its associated FVB profile, governs the choice of subjects to be taken at tertiary level and possibly places restrictions on this (to an extent that cannot be determined) for those taking the FVB compared with those taking the Baccalaureate. It is not easy to weigh up the advantages and disadvantages, and much depends on the intended purpose of the FVB. The current pattern in FVB holders' choice of UAS degree programmes very closely matches the requirements of the UAS courses that take the most students (engineering and IT, economics and services; → Figure 96). Around 90% of UAS students in these fields are holders of an FVB that matches the curriculum profile. The situation is different on UAS degree programmes where the proportion of students who have been admitted to the course with an FVB is very low, or where the corresponding FVB profile is relatively new (e.g. social work and health).

96 **Proportion of FVB holders whose FVB matches a corresponding UAS degree programme, 2007 entrants**

Data: FSO



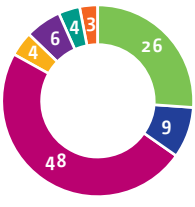
Two-year VET programmes replace previous two-year apprenticeships

Certified two-year VET programmes have been introduced to replace the previous uncertified two-year apprenticeships. This has been done to enable students which have undergone an abridged vocational training to continue their education and training if desired. Upon completion of a two-year VET programme, graduates not only receive a Federal VET Certificate but also have the option of advanced placement in a correspondingly shortened three or four-year VET programme leading to a Federal VET Diploma. At present, two-year VET programmes have been introduced for only a limited number of occupations (23 occupations as of May 2009); in addition, the regional/cantonal distribution of these programmes is very uneven. Nevertheless, there seems to be a clear demand for two-year VET programmes: in 2008, only four years after the new two-year programmes were introduced, the proportion of VET students enrolled in two-year VET programmes stood at 3.5%. This proportion was already higher than the one reached for uncertified two-year apprenticeships under the previous system. Moreover, in 2008, 6.1% of all newly signed apprenticeship contracts were in the new two-year VET programme (cf. *FSO, 2009c*).

The aim should certainly not be to encourage young people to enrol in a two-year VET programme if they are perfectly capable of completing a three-year or four-year VET programme. Nevertheless, it may be more efficient to have young people start out with the two-year VET programme when they are unable to find an apprenticeship at the end of lower-secondary level or are very likely to drop out of a three-year or four-year VET programme. On the whole, the effectiveness and efficiency of two-year VET programmes remains inconclusive due to the fact that such programmes have only recently been introduced and that there are still only a limited number of such apprentices in the individual occupations. Partial assessments (see *Bieri, 2007, 2008*) nevertheless show that fewer apprenticeship contracts have been broken off under two-year VET programmes than under three-year or four-year VET programmes. In addition, between one-fifth and one quarter of Federal VET Certificate holders immediately take advantage of the advanced placement option in a correspondingly shortened three-year or four-year VET programme. It is also interesting to note that students enrolling in two-year

97 **Percentage breakdown of FVB holders by UAS degree programme, 2007 entrants**

Data: FSO



- Engineering, IT, chemistry and life sciences
- Architecture, construction and planning
- Economics and services
- Design, music, theatre and other arts
- Social work
- Health care
- Other UAS degree programmes, teacher training excl.

VET programmes do not necessarily all have the same background or social position as used to be the case for the two-year apprenticeships under the previous education system. *Hoffmann and Kammermann (2007)* and *Kammermann, Amos, Hoffmann et al. (2009)* reported that the composition of students enrolled in two-year VET programmes is markedly different from that of students on two-year apprenticeships, with the former having a lower number of students from special-needs groups at lower-secondary level and also fewer students with a migration background. Although the assumption cannot be verified in statistical terms, it is perhaps the case that the new bridge-year courses (→ *Chapter Upper-secondary education, page 111)* have given students who tend to be disadvantaged the time needed to find an apprenticeship for a three-year or four-year VET programme. This would explain why the expected number of such students in two-year VET programmes was not found.

VET/PET funds

Article 60 of the Federal Vocational and Professional Education and Training Act states: «At the request of the corresponding professional organisation, the Federal Council may declare the professional organisation's VET/PET fund mandatory for all companies within that sector of the economy.» All the companies in a sector are then obliged to pay solidarity contributions for vocational training. At the end of 2008, sixteen VET/PET funds for professional organisations were declared mandatory. Some cantons also have cantonal VET/PET funds that are defined and structured very differently from one another. Whether they emanate from professional organisations or the cantons, these VET/PET funds are very heterogeneous and pursue different objectives. In 2008, a survey conducted of primarily stakeholders in existing VET/PET funds (see *B.S.S., 2008*) showed that these funds matched their statutory objectives to a large extent. At the same time, however, these funds have high management and administration costs. The analyses conducted thus far provide no indication as to whether the existence of VET/PET funds increases the willingness of companies to offer more or better quality apprenticeships. Although the Confederation never stated that the objective of VET/PET funds was to encourage a greater willingness to offer apprenticeships; this argument was prominently raised by supporters of cantonal VET/PET funds.

Effectiveness

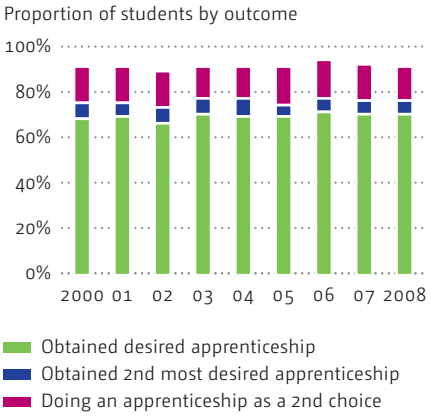
The effectiveness of the VET sector must not be analysed solely on the basis of various aspects; it must also be assessed from the different perspectives of the individual stakeholders. The public sector considers effectiveness from the viewpoint of the system as a whole and, of course, in terms of the quality of education and training (provided by VET schools, for instance). The private sector (or more specifically, training companies) considers effectiveness of the VET sector in terms of how it has helped them to become more profitable and competitive and by comparison to alternative forms of training. Students con-

In many cases, compulsory school graduates who do not find their **«desired apprenticeship»** prefer not to take up a different apprenticeship but to wait a year before searching in the same occupation again. Three-quarters of the young people who were unable to find an apprenticeship in 2008 stated that they would try again in the same occupation a year later, after pursuing an interim solution for a year (see *Link, 2008*). If the chances are slim that a student will find his/her desired apprenticeship after waiting a year, this constitutes an efficiency problem for both the individual and society. If the student's chances are good (especially if the apprenticeship is a challenging one), then the decision to wait a year can be the right one (→ *Equity, page 158*).

98 **Outcome of apprenticeship recruitment process by year**

Survey date: 31st August for all cohorts starting their 1st year of apprenticeship

Data: Link Institute, various cohorts



sider effectiveness (both in absolute and relative terms) on the basis of how the VET sector has contributed to their personal development and growth, with job and income prospects forming only part of the overall picture.

While some of these objectives correlate positively with each other (i.e. attaining one objective automatically improves the chances of another objective being attained), conflicts of objectives can certainly result for individual effectiveness objectives within this package of objectives.

Desired apprenticeship (as a measure of system effectiveness?)

Unlike general education programmes, dual-track VET programmes reflect the desires and aptitudes of students to a more limited extent. These VET programmes are mainly intended to suit the needs of training companies, which determine the availability of apprenticeships. Countries whose education systems are heavily or exclusively general education-based have argued from a systemic and individual standpoint that dual-track VET programmes and their dependence on training companies unnecessarily limit the personal development opportunities of young people at too early a stage. This is one of the reasons why OPET's apprenticeship barometer also analyses the level of satisfaction of VET students with their apprenticeship. At first glance, it may seem surprising that, in measurements conducted over the past few years, the economic situation, and hence the quantitative availability of apprenticeships, has had very little impact on the level of student satisfaction (→ Figure 98). Around 70% of respondents stated that they had found the apprenticeship that they had wanted. Around 5% stated that they had found a second-choice apprenticeship, and around 15% stated that enrolment in a dual-track VET programme was actually their second choice since they would have preferred to have enrolled in a Baccalaureate or specialised school (general education sector) or in an entirely school-based VET programme (VET sector). Different levels of satisfaction correlate with cultural familiarity with dual-track VET programmes, with the highest levels being found among Swiss students from the German-speaking region (cf. *SCCRE, 2006*). This high level of student satisfaction overall is a good sign, especially in the light of the fact that the vast majority of students competing on the apprenticeship market managed to find an apprenticeship.

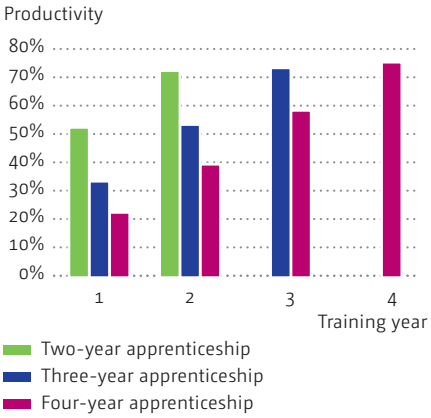
Student output during apprenticeships

In the VET sector, the effectiveness of education and training can be measured by comparing the professional skills of VET students with those of qualified workers. Generally speaking, the final examination at the end of the apprenticeship enables the objective determination of whether training objectives have been reached. However, VET trainers can also be asked to give their subjective assessment of whether VET students have reached these training objectives. While this latter approach essentially replaces objective criteria with subjective ones, it has the advantage of enabling comparisons to be drawn of effectiveness across various occupations, which would not be possible with comparative assessments based on final apprenticeship examinations.

The comparison of apprenticeships of various durations (→ Figure 99) confirms the hypothesis that VET students become more productive with each year of their apprenticeship (i.e. VET student productivity in per cent compared to the average productivity of an already qualified worker). At the same time, only the pattern of progression and not the productivity in the final year of the apprenticeship is a function of the duration. During the final year of their apprenticeship (i.e. on average, and not at the end of the year), and irrespective of the apprenticeship duration, VET students achieve around three quarters of the level of productivity of qualified workers. This means that the decisions made thus far as to whether an apprenticeship should last two, three or four years are correct, since the only reason for an apprenticeship to last longer would be if VET students needed extra time to acquire the desired competencies. This also seems to indicate that the VET sector is efficient, since any other outcome would have meant that VET programmes were either inefficiently long or inefficiently short.

99 **Average productivity of VET students per training year and apprenticeship duration, 2004**

Data: *Mühlemann, Wolter, Fuhrer et al., 2007*



Successful transition to the job market after graduation

If one looks beyond competencies and considering outcomes as a measure of effectiveness, then successful transition to the job market can be considered as a good indicator. Holders of an upper-secondary level VET qualification (→ *Chapter Cumulative effects, page 269*) have better job prospects than holders of only a lower-secondary level qualification. By better job prospects, we mean higher employment rates or a lower likelihood of becoming unemployed. At the same time, holders of a VET qualification earn a higher income. If we consider the increased income that one may expect to achieve upon completion of a VET programme (i.e. return on investment in education and training), we find that the benefits are slightly lower than with other forms of training. If we consider the very high levels of return on investment achieved from tertiary-level type B professional education and training (PET) and universities of applied sciences (UAS), it must be borne in mind that a portion of this return comes from the upper-secondary level VET programme, which opens the door to tertiary-level education and subsequent higher-paying jobs. The option of using VET programmes as a springboard to tertiary-level education and training may be one reason why the Federal Vocational Baccalaureate has been so popular (→ *Efficiency/Costs, page 153*). Indeed, the rising number of FVBs is not necessarily proportional to the rising proportion of students.

Persistently low participation ratios in continuing education and training (CET) among VET graduates who do not obtain any higher qualifications are the only negative point in a generally positive picture (→ *Chapter Continuing education and training (CET), page 253*). While good quality and adequate VET programmes may partially explain why VET graduates feel less of a need to attend CET courses, it may nevertheless be assumed that VET programmes do not sufficiently prepare all VET students for life-long learning. At the same time, however, it is unclear whether these students would be better prepared for life-long learning had they enrolled in the general education sector rather than in the VET sector.

Occupational mobility

It is the very same countries that lack a VET tradition that question whether VET programmes ensure occupational mobility. In a working world where workers are very unlikely to remain in the same occupation all the way to retirement, the question is whether VET programmes hinder occupational mobility. Measured in terms of the high horizontal and vertical occupational mobility of those following a dual-track VET programme in Switzerland, there are no quantitative indications that graduates of these programmes have difficulties with occupational mobility. What it is not possible to say, however, is whether the occupational mobility is as good in qualitative terms as for graduates of Swiss Baccalaureate schools and specialised schools. In other words, the lack of reliable data prevents us from determining whether individuals with a VET qualification suffer disadvantages in the case of forced occupational mobility or whether the VET qualification hinders desired mobility to an excessive extent. Points of comparison are also lacking for an assessment of these issues, i.e. we do not have a counterfactual situation. In other words, even if we were able to state with certainty that mobile individuals suffer disadvantages in the case of forced mobility, it is not known whether they could have avoided these negative consequences if they had studied in the general education sector instead of the VET sector. In the short term, it can be seen (in line with expectations) that individuals who (have to) change occupations after obtaining their VET qualification lose some of the competencies that are unique to their occupation and therefore also lose some of their income advantages (see *Müller & Schweri, 2009*). That having been said, the vast majority of VET students experience a relatively smooth school-to-work transition thanks to the proximity of their training to the world of work. This is much less the case for students from the general education sector. The impact of VET programmes on occupational mobility as well as the consequences of such mobility have not yet been adequately researched to draw any reliable conclusions.

Effectiveness of the Federal Vocational Baccalaureate

Around two-thirds of all VET students prepare for the FVB examination on a part-time basis during their three-year or four-year VET programme. One-third of all VET students prefer to complete their VET programme first and then enrol in a one-year, full-time preparatory course for the FVB examination. Unfortunately, individual data regarding the progression of studies of VET students are not available, which prevents us from providing a representative picture. Isolated studies, however, have shown high dropout rates among VET students who attempt to prepare for their FVB during their VET programme (see *Stocker & Bachmann Hunziker, 2008*). Research needs to be conducted to determine whether better alignment of work-based training and FVB preparatory classes can reduce these dropout rates (thereby increasing the effectiveness of education expenditure) or whether high dropout rates are the consequence of not having selected the right students for admission to the part-time FVB preparatory course.

Efficiency/Costs

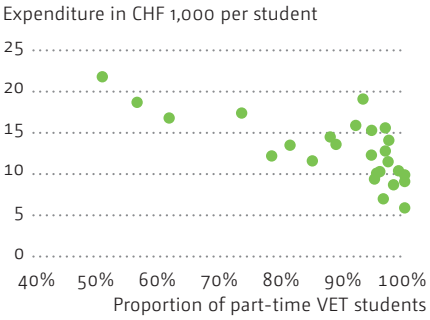
Public VET expenditure

For the past few years, the Federal Office for Professional Education and Technology (OPET) has been using a calculation model developed by PricewaterhouseCoopers to determine cantonal costs for the VET sector on the basis of uniform criteria. These figures show a significant correlation between the type of VET programme and associated costs. Dual-track VET programmes generate significantly lower public expenditure than entirely school-based ones (→ Figure 100). This is because a larger portion of the learning process in dual-track VET programmes takes place during apprenticeships at training companies, which enables the cantonal authorities to keep their costs down. Moreover, very small cantons that lack their own vocational schools or send a large number of students to the vocational schools of other cantons, tend to have a low level of costs. This means that these cantons spend less in compensatory payments to host cantons than the host cantons themselves spend on maintaining their vocational schools. *Frick (2008)* conducted a study using data from 1990 to 2004 (i.e. based on non-harmonised cost calculations). This study found that cantons with a high proportion of health and social care occupations had higher costs. The study would, however, suggest that the cost data (which were not based on the model developed by PricewaterhouseCoopers) do not yet lend itself to a precise efficiency analysis. The output data also provide no indications as to the quality of training. In addition, the vocational school level should be taken as the basis for an efficiency analysis, since intracantonal comparisons show that the costs for VET students in the same occupation may vary considerably from one vocational school to another.

Corporate VET expenditure

Dual-track VET programmes, where training companies pay most of the training costs, will only be appealing for companies if the benefits of apprenticeships outweigh the costs. One such benefit may be derived immediately by having VET students generate real output during their apprenticeships and/or in the longer run by hiring VET students after graduation. Since Switzerland's job market is not very highly regulated, the majority of companies (particularly SMEs) find it very important to be able to recover their training costs during the apprenticeship through the appropriate benefit. If this is possible, there will be a larger number of apprenticeships as companies find their commitment to VET programmes to be economically feasible (see *Mühlemann, Schweri, Winkelmann et al., 2007*). Regulations ensuring a high degree of cost efficiency can lead to a greater number of apprenticeships and do not have to be in contradiction to the quality of training. In Switzerland, around two-thirds of apprenticeships produce a net benefit for the training company by the time they are completed, which means that, in one third of cases, the training companies have to gain this benefit after the apprenticeship has been completed. While various company-related factors determine whether a given apprenticeship has a positive or negative cost/benefit ratio while it is running, the type of occupation is the main factor (→ Figure 101). Practi-

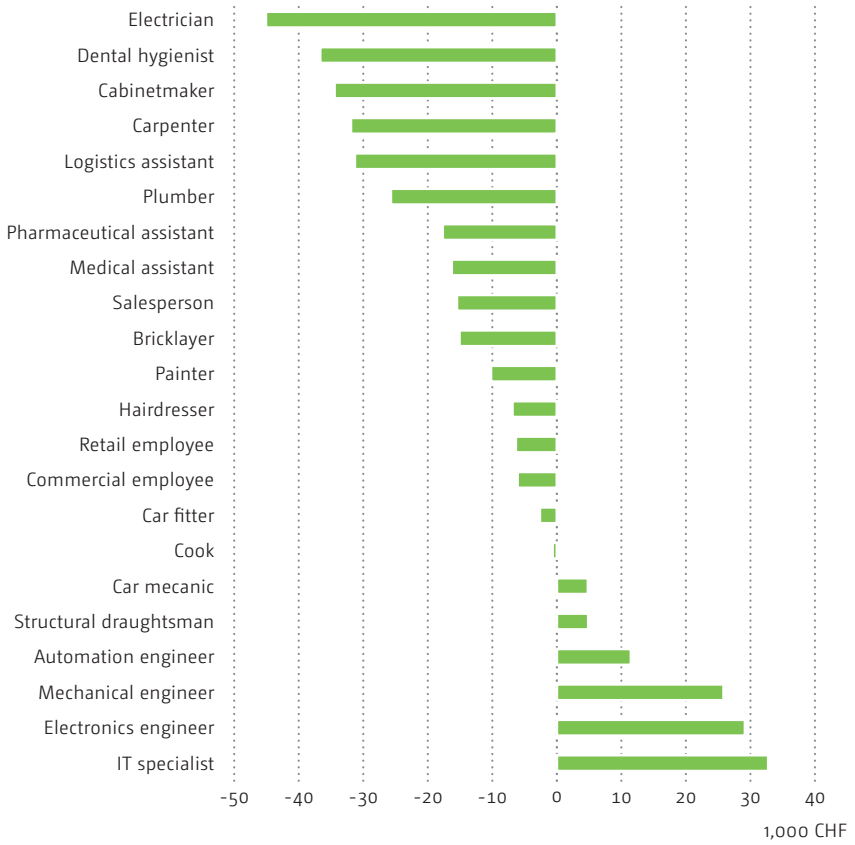
100 **Comparison of cantonal expenditure for VET programmes, 2007**
Expenditure for all VET programmes (incl. entirely school-based)
Data: Federal Office for Professional Education and Technology (OPET



A comparison of **cantonal expenditure for VET programmes** is revealing from an education policy standpoint. The high correlation (0.71) between entirely school-based VET programmes and expenditures per VET student clearly shows the extent to which cantonal costs for VET programmes increase when the proportion of dual-track VET programmes decreases. Cantons with a large proportion of dual-track VET programmes, such as the cantons situated in the eastern part of the country, would experience a 50% increase in total cantonal expenditure for VET programmes if the ratio of dual-track VET programmes were reduced by 20% in favour of entirely school-based VET programmes.

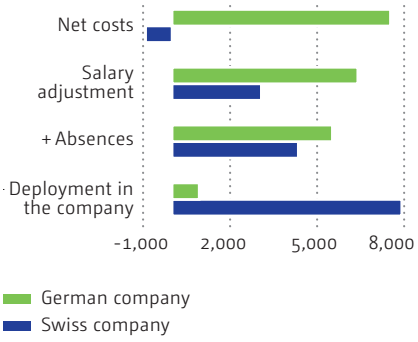
101 **Net costs of apprenticeships for training companies, per VET student and training year, 2004**

Data: *Mühlemann, Wolter, Fuhrer et al., 2007*



102 **Net costs of apprenticeships for training companies, in EUR, 2000**

Data: *Dionysius, Mühlemann, Pfeifer et al., 2009*



Explanation

From top to bottom, the chart should be interpreted as follows: the top of the chart shows the average net costs of a German or Swiss training company. As we look down the chart, the corresponding values of the parameters affecting the net costs of German or Swiss training companies are adjusted upwards/downwards. The adjusted calculation of net costs shows the effects of changes in these parameters. This enables us to isolate parameters to determine the corresponding impact (of absences, for instance) on the net costs of German or Swiss training companies with all other factors remaining the same.

cally all of the «most expensive» occupations fall into the four-year apprenticeship category; however, not all four-year apprenticeships are cost-intensive, as the VET programme for electricians shows. Occupations with negative cost/benefit ratios during the training phase tend to be of a more technically challenging nature and relate to industry (e.g. VET programme in mechanical engineering) or services (e.g. VET programme in information technology). With these occupations, training companies need to transfer a great deal of specific company-related and product-related know-how during the apprenticeship. By the end of their apprenticeship, VET graduates have acquired competencies that training companies would be unable to find elsewhere on the job market. The costs of training that are not recovered can thus be saved after the apprenticeship through the savings made on recruitment and work familiarisation costs.

In addition to company-related factors and the type of occupation, the state and the social partners introduce regulations that affect the cost efficiency of VET programmes, as is clearly demonstrated in a comparison between Germany and Switzerland (see *Dionysius, Mühlemann, Pfeifer et al., 2009*). Generally speaking, apprenticeships in Germany tend to generate net costs for the training companies involved, while the opposite tends to be the case in Switzerland. There seem to be three main factors that explain this difference (→ Figure 102): a) the wage differential between VET students and qualified workers, b) time spent at or away from the training company and c) the

output supplied by VET students at the training company. While Swiss and German VET students earn practically the same salaries in absolute terms, the difference between salaries paid to VET students and qualified workers is much higher in Switzerland; VET students in Switzerland spend more time at training companies (fewer days at vocational school, on holiday and on sick leave); and the most decisive difference is that VET students in Switzerland generate real output at training companies whereas VET students in Germany tend to spend more time «practising». In 2000, which is the year for which this comparison can be applied, the negative cost/benefit ratio for German training companies did not seem to have any impact on their demand for VET students. This was because the highly regulated German job market often enables companies to indirectly recover their costs by hiring VET students after the apprenticeship. At the same time, VET students are faced with limited occupational mobility since legislation or agreements between the social partners on the German job market make it more difficult for VET students to change employers after graduation. As a result, training companies hire VET graduates and pay them a salary that is slightly below the VET graduate's level of productivity, thereby enabling the company to derive a benefit from its training activities. In Switzerland, however, simulation calculations (see *Wolter, Mühlemann & Schweri, 2006*) have shown that training companies that would need to wait until after the apprenticeship is over before they can recover their costs are more likely to refrain from offering apprenticeships in the first place.

Disruption of apprenticeship contracts

The disruption of apprenticeship contracts can be, but does not have to be an efficiency problem. In order to determine whether efficiency problems exist, we first need to know why apprenticeship contracts are terminated and what consequences this brings. If apprenticeship contracts are terminated because VET students wish to transfer to another VET programme (so that the requirements are more closely aligned with their personal aptitudes and skills), this may actually be more efficient from an individual and systemic standpoint. The only question that then remains is whether better occupational guidance or other measures would have enabled the VET student to avoid taking a diversion via the «wrong» VET programme, or if, indeed, it was a diversion at all.

As with other questions, we find that there is a lack of sufficient data that would enable us to carry out a precise analysis on the basis of empirical observations. Due to the absence of longitudinal data, it is not known how many disruptions of apprenticeship contracts in Switzerland have actually resulted in VET students dropping out of the VET programme, or have resulted in lost training years, which could have been avoided with better framework conditions.

The most recent cohort studies containing informative analyses on this matter have been conducted in the Canton of Geneva (see *Rastoldo, Evrard & Amos, 2007*, and *Rastoldo, Amos & Davaud, 2009*) and the Canton of Bern *(Schmid & Stalder, 2008)*, the latter placing a clear focus on disruption of apprenticeship contracts. Although there are major differences between cantons (which mainly have to do with the prevalence of dual-track VET programmes as well as regional job market conditions), the findings from the

Early disruption of apprenticeship contracts does not happen by chance. The studies mentioned – and also *Bertschy, Cattaneo & Wolter (2009),* using longitudinal data concerning young people based on the TREE survey – found evidence that poor academic achievement during compulsory education increased the likelihood of early disruption of apprenticeship contracts. These findings indicate that, in the same way as in all areas of the education system, performance in the upper-secondary level VET sector is a function of the performance of other parts of the education system. A German study *(Bessey & Backes-Gellner, 2008)* shows that early disruption of apprenticeship contracts also depends on local job market conditions. Opportunity costs and income prospects generally influence the behaviour of VET students, especially those young people who succumb to a too short-term focus.

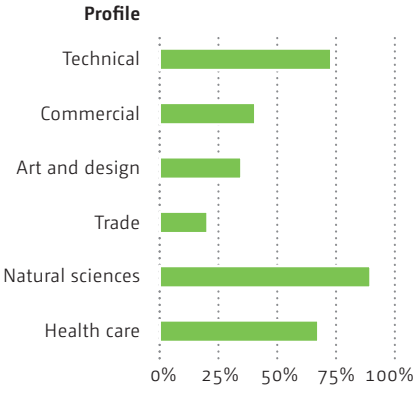
study conducted in the Canton of Bern ought to be representative for many other cantons (at the very least for the German-speaking cantons). *Schmid & Stalder (2008)* note that around three-quarters of all disruptions of apprenticeship contracts lead to an alternative solution at upper-secondary level. All in all, around one-third of the cases led to a definitive dropout. This discrepancy in percentages was caused by multiple apprenticeship contracts being terminated for the same VET student or by the failure of a VET student to pass the final apprenticeship examination in their second VET programme. Around 5% of the transfers resulted in a more challenging apprenticeship and around 22% of the transfers resulted in a less challenging apprenticeship. For the remaining 70% of the transfers, around half of the VET students remained in the same occupation but signed an apprenticeship contract with a different training company and half changed occupations. It is also interesting to note that regardless of whether the new apprenticeship was less challenging or more challenging, in most cases, the VET students remained with the same training company.

The results of the longitudinal study conducted in the Canton of Geneva *(Rastoldo, Amos & Davaud, 2009)* differ from the study conducted in the Canton of Bern in two noteworthy respects. First of all, the number of disruptions of apprenticeship contracts that did not lead to a new apprenticeship turned out to be much higher (most of the former VET students found an unqualified job eventually). Secondly, constant switching between a new apprenticeship, unemployment and employment was much more prevalent. Both studies show that disruptions of apprenticeship contracts must be interpreted in very concrete terms against the background of the local job market and the education system conditions.

The introduction of a two-year VET programme might be a more efficient alternative to having VET students lose training years, switch to a less demanding apprenticeship or drop out from a three-year or four-year VET programme and/or the upper-secondary level entirely. In this light, the observation (→ *Institutions, page 145*) that the profile of students enrolled in two-year VET programmes was less the type of students found in two-year apprenticeships under the former system and more the type of students found in three-year or four-year VET programmes should be interpreted in a positive manner.

103 **FVB-to-UAS transition rates for all FVB holders from the 2003 cohort, by FVB profile, in per cent**

Data: FSO



Transition from FVB to UAS degree programmes

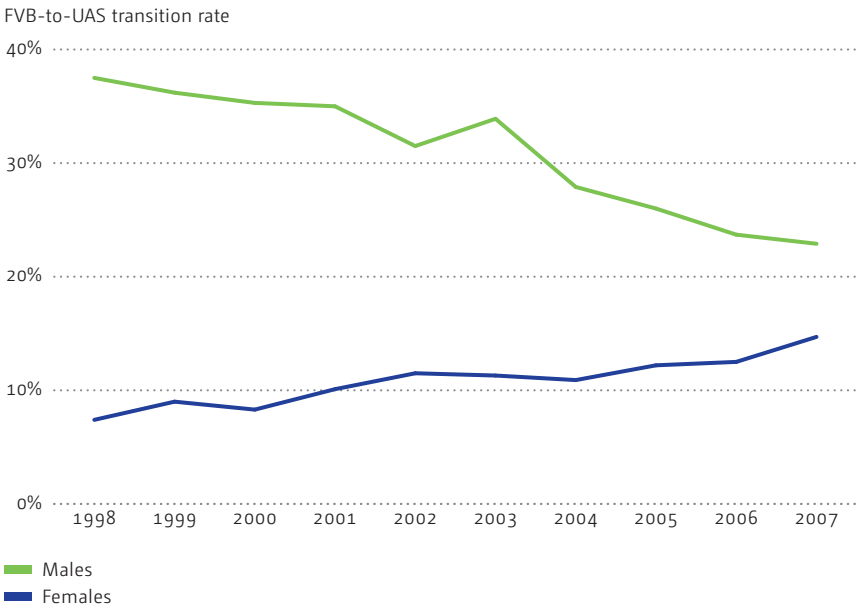
Since the first measurement of transitions from FVB to UAS degree programmes, transition rates for males have fallen by around ten percentage points (1998: 72%, 2004: 63.5%). By contrast, transition rates for females, which started out at a very low level, have increased somewhat (1998: around 28%, 2004: 31%). There is no clear explanation for these two trends (→ Figures 103 and 104), and it is currently not known whether this is the result of efficiency problems.

The decline in the transition rate for males seems to correlate with a strong decline in the immediate FVB-to-UAS transition rate, which was not compensated by a higher postponed FVB-to-UAS transition rate. The decline should be analysed on the basis of two factors, however. First of all, it would

appear that the decline came after 2003, at about the time when the economic situation began to improve considerably. This will have prompted many FVB holders to take advantage of the good job market situation to find a job to begin with. If this hypothesis proves valid, then we should see higher FVB-to-UAS transition rates again starting from 2009/10. Secondly, unlike transitions from the upper-secondary general education sector to conventional universities, immediate FVB-to-UAS transitions are not always the most efficient strategy. Studies *(Bonassi & Wolter, 2002)* have shown that older students who enrol in UAS degree programmes on a part-time basis (taking advantage of the combination of work experience and studies) are able to obtain higher starting salaries than younger students who enrol in UAS degree programmes on a full-time basis. Low FVB-to-UAS transition rates would clearly be an efficiency problem in a case where the only criteria justifying (both public and private) FVB expenditure was students actually beginning (and finishing) their UAS studies. However, unlike the Baccalaureate, the Federal Vocational Baccalaureate can serve other purposes, such as preparing VET students for tertiary-level type B professional education and training (PET) (even though this path does not specifically require the FVB). Since PET programmes can only begin after students have gained a few years' work experience, it is statistically difficult (without long-term follow-up studies) to determine exact FVB-to-PET transition rates. Thus, transition rates measured over a short period of time clearly cannot be used as a reliable efficiency indicator.

104 **Immediate FVB-to-UAS transition rate for all FVB holders from the 2003 cohort, by gender**

Data: FSO



Equity

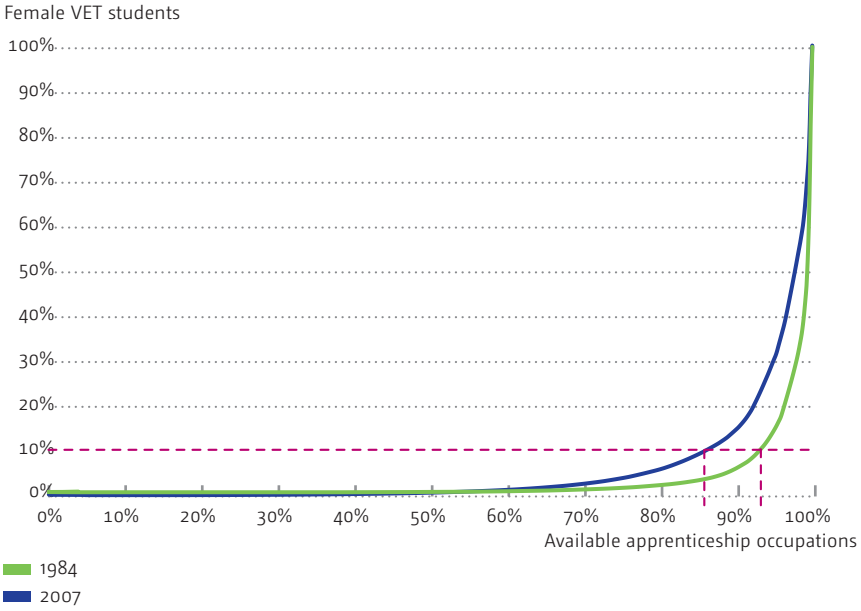
Gender segregation

If equity in VET programmes were equated with an even distribution of the genders over the different apprenticeship occupations, then not much would have been accomplished over the past few decades to ensure equity within the VET sector. Even though major changes have come about in

This chart shows that, in 1984, 90% of all female VET students were in just over 5% of all available apprenticeship occupations. In 2007, this proportion increased to 15%. This means that only 10% of all female VET students are spread over the remaining 85% of available apprenticeship occupations (in 2007, this included around 225 occupations).

105 **Distribution of female VET students in available apprenticeship occupations, 1984 and 2007**

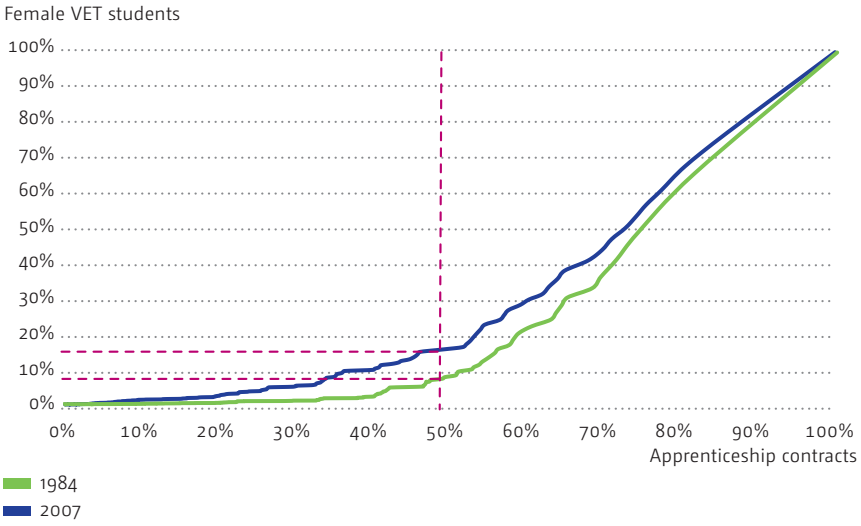
Data: FSO; calculations: SCCRE



106 **Distribution of female VET students among apprenticeship contracts, 1984 and 2007**

Data: FSO; calculations: SCCRE

This chart adds apprenticeship contracts by occupation from left to right, with an increasing proportion of female students. If the curves ran proportionally from left to right, then there would be an equal distribution of female and male VET students among all apprenticeship contracts. In 1984, 50% of the apprenticeship contracts with the lowest proportion of female VET students drew only 10% of female VET students, and nearly 35% of all apprenticeship contracts were almost exclusively male-dominated. Both in 1984 and 2007, we find that 50% of all female VET students hold fewer than 30% of all the apprenticeship contracts.



terms of both the number of occupations as well as in the occupations themselves, female VET students still tend to be limited to a small spectrum of apprenticeship occupations (→ Figure 105). This may have something to do with the fact that there are a very small number of apprenticeships (and therefore VET students) in many occupations. However, even if occupations are weighted according to the number of available apprenticeships (→ Figure 106), we find that progress towards an even distribution of the genders within apprenticeship occupations has been relatively modest. Perhaps the most significant progress would be that the number of apprenticeship occupations that previously had practically no female VET students has fallen by about half over the past twenty-five years. At the same time, however, there has been very little «masculinisation» in the small number of occupations that have traditionally been the preserve of female VET students.

Despite major efforts, gender segregation in apprenticeship occupations persists. However, this does not necessarily mean that there is an equity problem. Equity problems should only be suspected if the disproportionate gender distribution resulted from a restricted selection process for the occupation taken up (i.e. if female VET students found themselves in traditionally female-dominated occupations even though they would have preferred a traditionally male-dominated or gender-balanced occupation). For the most part, this assumption can probably be discarded if we consider the large number of VET students (around 75%) (→ *Efficiency/Costs, page 153*) who stated that they had found the apprenticeship that they had wanted, and also if we are able to largely exclude the problem of VET students later rationalising their choice. A recent study (see *Abraham & Arpagaus, 2008*) has shown that gender-based choices of occupation are strongly influenced by parents. In such cases, there may be an equity problem if VET students are «pushed» towards occupations that prove to be less economically advantageous as a function of the gender distribution in the occupation in question. While some female-dominated occupations may indeed be less economically advantageous than male-dominated or gender-balanced occupations, this is certainly not the case for the vast majority of female-dominated occupations. The above-mentioned study also shows that female VET students also choose female-dominated occupations even when they know that these occupations are less economically advantageous. The fact that this same research shows that occupations pursued by both genders seem to be the more attractive occupations overall, since good academic performance increases the likelihood of a student learning in a gender-balanced occupation, is again not an indication of an equity problem.

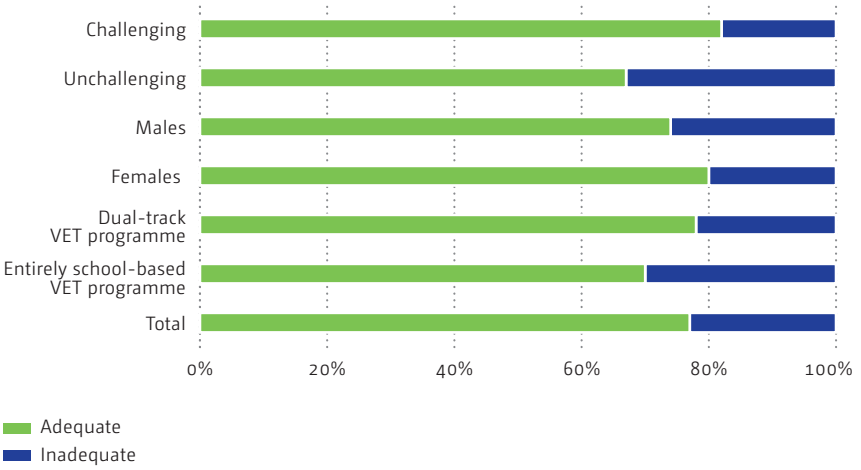
Even if it cannot be definitively proven that gender segregation – whether intentional or unintentional – constitutes an equity problem, the continuing large numbers of almost entirely female-dominated and almost entirely male-dominated occupations is a situation that needs to be discussed from a social standpoint (and probably only to a lesser extent from a education-policy angle).

School-to-work transition

The equity problem encountered in the school-to-work transition actually originates in the transition from primary school to lower-secondary education. As it happens, VET graduates who complete a less intellectually demanding apprenticeship (it is the careers advisory services that categorise apprenticeships on the basis of the requirements involved) are significantly more likely (→ Figure 107) to find either no job after graduation or only an unqualified job that would not have needed the apprenticeship (with all of the long-term problems associated with such employment; these jobs are listed as inadequate employment in Figure 107). The influence of the type of VET programme on job prospects is a causal one, i.e. it does not depend

107 **Proportion of VET students holding adequate or inadequate employment one year after completion of their VET programme, 2005**

Data: TREE; calculations: *Bertschy, Cattaneo & Wolter, 2009*



only on the fact that the least performing students find themselves in the least demanding apprenticeship occupations (see *Bertschy, Cattaneo & Wolter, 2009*). Since, however, the likelihood of finding oneself in a less attractive apprenticeship occupation depends not only on academic performance at lower-secondary level but also on the type (ability group) of lower-secondary level education pursued, the selection at lower-secondary level, which is not based entirely on objective performance criteria, has an impact many years later on the job market prospects of the young people in question.

At this point, it can also be said that training companies could contribute more to ensuring more equal opportunities if they paid less attention to the ability group that apprenticeship candidates were assigned to at lower-secondary level when recruiting and, instead, based their recruitment decisions on candidates' actual performance. Even if such a recruitment process were to come at a higher cost, training companies would benefit through an additional return, because their current practice of considering only lower-secondary students from high or middle-ability groups has resulted in apprenticeship contracts being given to VET students who do not always meet the performance expectations.

The research findings may be considered positive from an equity standpoint because they show that VET student performance during the apprenticeship has a greater impact on a successful school-to-work transition than the VET student's prior academic achievement at lower-secondary level. In other words, apprenticeships offer students the chance to compensate for insufficient academic achievement during compulsory education by showing greater work-based performance over the course of their VET programme. Provided, of course, that they have been able to find a suitable apprenticeship in the first place.

Upper-secondary specialised schools

In the early 1970s, the Swiss Conference of Cantonal Ministers of Education (EDK) became aware of the need to coordinate upper-secondary specialised school activities. At the time, upper-secondary specialised schools were called *Diplommittelschulen (EDK, 1972)*. *Diplommittelschulen* had been created from a merger of upper-secondary level girls' schools and commercial schools, whose roots dated back to the 19th century in some cases. The EDK's efforts to harmonise specialised schools led to the adoption of its «Guidelines on Recognition of Specialised School Certificates» in 1987 as well as to the drafting of core curricula for specialised schools in 1988 *(EDK, 1989)*. Following the enactment of the new Federal Vocational and Professional Education and Training Act in 2004, which specifies that only tertiary-level institutions may award a *Diplom* (degree), the *Diplommittelschulen* were renamed *Fachmittelschulen* (upper-secondary specialised schools).

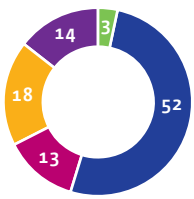
Transition from mere feeder schools to schools providing a blend of general education and job-market training in specialised occupations

Until fairly recently, specialised schools acted as feeder schools for non-university tertiary-level education and training (PET) in the fields of education, paramedicine and social care *(EDK, 1989)*. Since such education and training programmes only accepted students as of age eighteen, these specialised schools bridged the gap in a meaningful manner by preparing students for subsequent training. After the Federal Office for Professional Education and Technology (OPET) was given authority over upper-secondary level education and training in health care, social care and art (HSA), corresponding VET programmes based on the provisions of the Federal Vocational and Professional Education and Training Act (2004) were introduced. This essentially changed the positioning of various health care, social care and art programmes at both upper-secondary and tertiary levels. In the French-speaking region, most education and training in the area of health care takes place at universities of applied sciences while, in the German-speaking region, a number of equivalent programmes are still taught at tertiary-level type B professional colleges *(GDK, 2006)*. At the same time, combined school/work-based VET programmes in health care and social care gave 16-year-olds the opportunity to receive similar training at upper-secondary level. These developments (i.e. the extensive repositioning of HSA education and training at tertiary level, coupled with upper-secondary level VET programmes for entering the HSA professions) required the revision of the specialised schools' curricula. In addition to providing a strong general education, as in the past, specialised schools now provide the training that is needed for specific occupations. This diversification in the subjects offered and in the profile of specialised schools is mainly intended to prepare students for entry to the corresponding tertiary-level B professional education and training programmes. Some specialised school programmes also prepare students for entry to universities of teacher education and universities of applied sciences.

A clear predominance of female students in specialised schools can be explained by the fact that these schools offer training in occupations that are mainly female-dominated. In the 2007/08 school year, roughly three-quarters of the student body were female still. In 2008, the proportion of foreign

108 **Education background of upper-secondary specialised school entrants, 2008, in per cent**

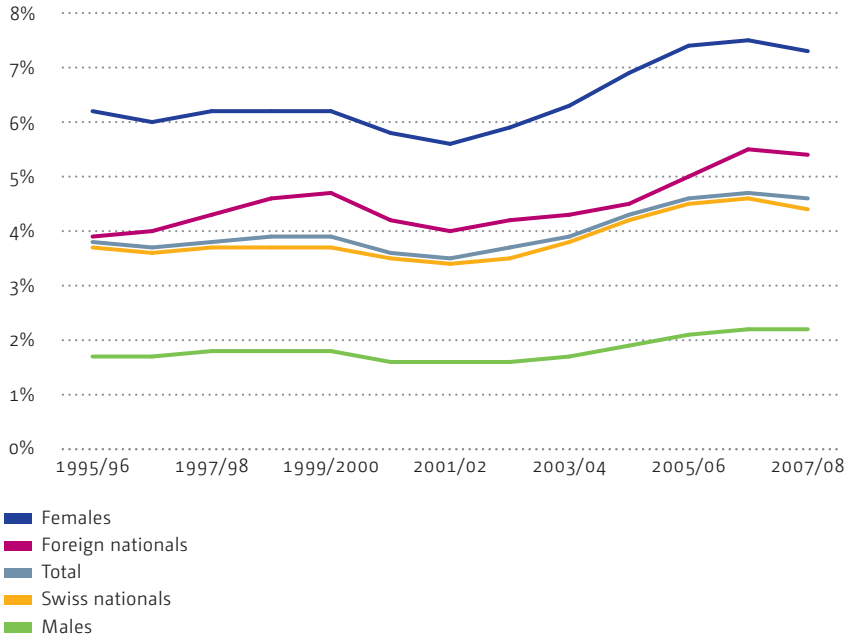
Data: FSO



- Lower secondary level, low-ability group
- Lower secondary level, middle and high-ability groups
- Lower secondary level, mixed-ability group
- Post compulsory education
- Other

109 **Proportion of specialised school students at upper-secondary level, 1995–2007**

Data: FSO



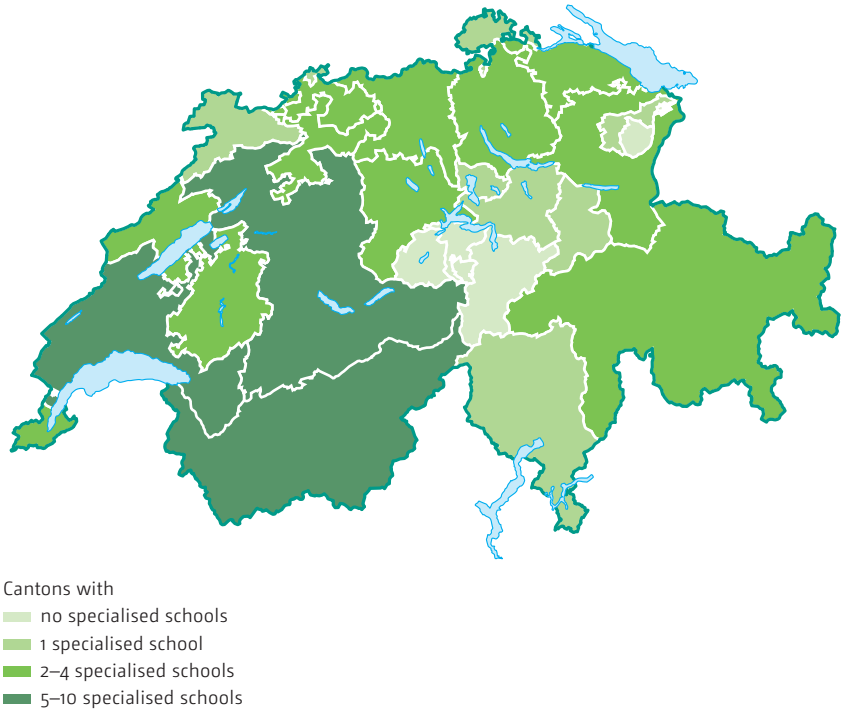
nationals in specialised schools was once again slightly higher than the proportion of foreign nationals in all the upper-secondary level schools taken together (→ Figure 109).

Figure 108 shows the educational background of specialised school entrants. In 2008, only two-thirds of specialised school entrants were compulsory school graduates (compared to 78% in 2004). Half of these specialised school entrants came from the middle and high-ability groups (around 10% fewer than in 2004). There was also a 10% increase in the number of students from specialised school/general-education schools at upper-secondary level who decided to interrupt their existing programme to enrol in another type of upper-secondary level school.

As far as the socio-economic status (SES) of the parents of specialised school entrants is concerned, PISA data for 2000 and 2006 show that nearly 60% of all specialised school students come from the middle two quartiles of the SES scale, which clearly sets specialised schools apart from vocational schools offering dual-track VET programmes. According to the PISA data for 2006, it is also seen that 19.7% of the parents of specialised school students would have preferred their child to have enrolled in a Baccalaureate school and later attend university rather than enrol in a specialised school (18% of the parents of female students and 24% of the parents of male students). Here it is important to note that the PISA data do not directly reflect the opinions of parents but rather the expectations that the students think that their parents have. Some of these hopes are fulfilled, since around 12% of all students who obtain an upper-secondary Specialised School Certificate, then switch to a Baccalaureate school.

110 **Geographical distribution of upper-secondary specialised schools, 2009**

Data: www.fms-ecg.ch (June 2009); map: Swisstopo



Sixty upper-secondary specialised schools and the programmes they offer

The EDK adopted new regulations on the recognition of upper-secondary specialised schools in 2003. This set the stage for the introduction of upper-secondary specialised schools to replace the *Diplommittelschulen* by August 2007. As of February 2009, there were sixty specialised schools (→ Figure 110) offering full-time programmes lasting for three years. These schools are part of Switzerland's upper-secondary level general education sector. Upper-secondary specialised schools are required to:

- provide students with an extensive general education,
- provide students with opportunities to develop social and personal skills,
- offer subjects relating to specific occupational fields,
- assist students in their choice of occupation,
- prepare students for tertiary-level type B professional education and training (PET),
- award students an upper-secondary Specialised School Certificate and an upper-secondary Specialised Baccalaureate relating to a specific occupational field or to specific courses in the non-university tertiary level B sector *(EDK, 2003)*.

Upper-secondary specialised schools provide graduates with three different options for entering tertiary-level education:

- Upon completion of the first three years, specialised school students will receive a Specialised School Certificate which entitles them to enrol in specific tertiary-level type B professional education and training (PET).

– Specialised school students who go on to complete the fourth year will receive the Specialised Baccalaureate, which entitles them to enrol in specific courses at universities of applied sciences.
– Specialised school graduates wishing to enrol in a university of teacher education may do so provided that they pursue supplementary general education *(EDK, 2003)*.

111 Cantons with upper-secondary specialised schools: occupational fields for which students can obtain a Specialised School Certificate or a Specialised Baccalaureate

Data: www.fms-ecg.ch (June 2011)

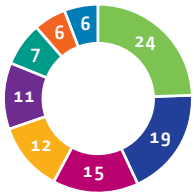
Example
In the Canton of Aargau, the upper-secondary specialised schools offer students the possibility of obtaining a Specialised School Certificate in five out of the six occupational fields listed. However, students can only obtain a Specialised Baccalaureate Certificate for four of these occupational fields starting from 2009 or 2010 (see «Total» column).

	Health care and natural sciences	Social work	Education	Information and communication	Art and design	Performing arts	Total
AG	2007 / 2010	2008 / 2010	2007 / 2009	2007 / 2010	2007		5 / 4
AR	2008 / 2009	2008 / 2009	2008				3 / 2
BE	2007	2007		2007		2010	4 / 0
BL	2007 / 2008	2007 / 2008	2007 / 2008	2007	2007 / 2008	2007 / 2008	6 / 5
BS	2007 / 2008	2007 / 2008	2007 / 2008	2007 / 2008	2007 / 2008	2007 / 2008	6 / 6
FR	2008	2008	2008				3 / 0
GE	2005 / 2006	2005 / 2006		2005	2005 / 2007	2005	5 / 3
GL	2005		2005				2 / 0
GR	2006	2006	2006				3 / 0
JU	2007	2007	2007		2007	2007	5 / 0
LU	2007	2007	2007 / 2009			2008 / 2009	4 / 2
NE	2008	2008	2008			2010	4 / 0
SG	2007 / 2010	2007 / 2010	2007		2007	2007	5 / 2
SH	2008 / 2009	2008 / 2009	2008	2008 / 2009			4 / 3
SO	2007 / 2008	2007 / 2008	2007 / 2008				3 / 3
SZ	2005	2005	2005 / 2009		2005		4 / 1
TG	2007 / 2009	2007 / 2009	2007				3 / 2
TI	2007	2007					2 / 0
VD	2008	2008	2008		2008	2008	5 / 0
VS	2008 / 2010	2008 / 2009	2008 / 2009				3 / 3
ZG	2007	2007	2007 / 2009				3 / 1
ZH	2008 / 2009	2008 / 2009	2008	2008 / 2009		2008 / 2011	5 / 4
Total	22 / 11	21 / 11	19 / 8	7 / 4	8 / 3	10 / 4	

Figures in black = Specialised School Certificate
Figures in red = Specialised Baccalaureate
Highlighted in light green: Upper-secondary specialised schools in these cantons do not offer students the possibility of obtaining a Specialised Baccalaureate.

112 **Student paths one year after completion of the third year of upper-secondary specialised school, in per cent, 2008**

Data: FSO



- Preparatory course for Federal Vocational Baccalaureate
- 4th year of specialised school for Specialised Baccalaureate
- Other baccalaureate school
- VET programme: business and administration
- PET programme
- Other school providing a general upper-secondary education
- VET programme: health and social care
- VET programme: skilled crafts, engineering, agriculture

Specialised schools are thus required to provide students with a more in-depth general education and job-market training in the following occupational fields: social work, information and communication, art and design, music and the performing arts, applied psychology and education. The content of job-market training is set out in the core curricula for upper-secondary specialised schools *(EDK, 2004)*. There are two ways that specialised school graduates may enrol in universities of teacher education: 1) if they obtain a Specialised Baccalaureate in Education, 2) if they obtain a Specialised School Certificate only, but pass the university aptitude test as an alternative to a Specialised Baccalaureate *(EDK, 1999a)*.

There are upper-secondary specialised schools in twenty-two Swiss cantons. In twelve of these cantons, specialised schools are independent institutions affiliated to a Baccalaureate school. Nearly all the twenty-two cantons offer students the possibility of obtaining a Specialised School Certificate in the three occupational fields of health care, social work and education, while fewer than half of the twenty-two cantons offer a Specialised School Certificate in the other three occupational fields. Eight cantons (i.e. Ticino and all the French-speaking cantons except for the Canton of Geneva and the Canton of Valais) do not enable students to obtain a Specialised Baccalaureate in any of the six occupational fields (these Cantons are highlighted light green in Figure 111). On the opposite end of the scale, six cantons offer students the possibility of obtaining a Specialised Baccalaureate in (nearly) all six of the available occupational fields.

In order to determine the effectiveness of upper-secondary specialised schools, we need to understand their educational objective: they prepare students for non-university, tertiary-level type B professional education and training (PET) and offer two different qualifications for this, the Specialised School Certificate and the Specialised Baccalaureate. For lack of data on educational paths, we are unable to determine whether most specialised school graduates go on to enrol in a non-university PET programme. All we are able to determine is what specialised school graduates did in the year following completion of the first three years of their specialised school programme (→ Figure 112). The data include students who repeated a year or remained in the specialised school for the fourth year to take their Specialised Baccalaureate.

An analysis of the effectiveness of outcomes (e.g. success on the job market) is equally difficult, since the number of students attending upper-secondary specialised schools is low. Random sampling, as is used for the FSO's Swiss Labour Force Survey (SLFS), is also inadequate, since too few specialised school graduates are observed for drawing reliable conclusions.

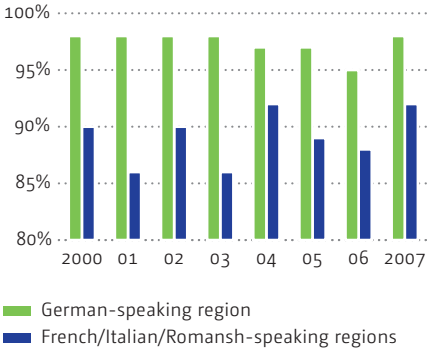
If we take the graduation rates from specialised schools as a measure of effectiveness, then we find that roughly 86% to 98% of all students obtain a certificate upon completion of their specialised school programme. Since the specialised school qualifications are not standardised, and it is impossible to verify student admission criteria for specialised schools, high graduation rates cannot automatically be taken as a measure of effectiveness. The reasons for the major differences in examination success rates between the German-speaking region and the French/Italian/Romansh-speaking re-

gions are also unclear (→ Figure 113). The lack of personal data also makes it impossible for us to determine the extent to which examination failure results in students dropping out of the specialised school entirely or obtaining their upper-secondary level qualification elsewhere (e.g. another specialised school or a different type of upper-secondary school).

It is also impossible for us to assess the efficiency of upper-secondary specialised schools at present, since no figures indicating the cost of specialised school programmes are available. Unlike at tertiary level, there is no intercantonal agreement on compensatory payments between cantons in a case where a student from one canton enrols in a specialised school in another canton. There are only bilateral agreements between cantons, which – we assume – work on the basis of different costs.

113 **Comparison of Upper-secondary Specialised School Certificate success rates, German-speaking region vs. French/Italian/Romansh-speaking regions of Switzerland, 2000–2007**

Data: FSO



Tertiary-level education

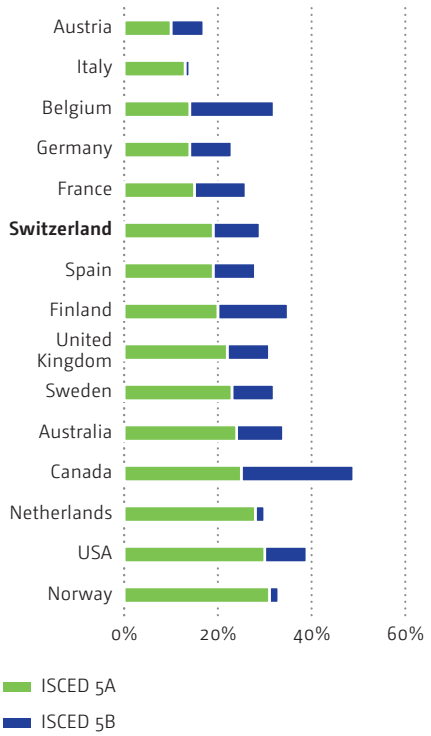
In this report, emphasis is placed on three different types of university, which differ in terms of their institutional structure as well as in terms of the content of their degree programmes:

- Conventional universities have the right to issue doctorates. They are run by the cantons or the Confederation, with the admission requirement being a Baccalaureate.
- Universities of applied sciences (UAS) are vocationally-oriented universities run by the Confederation. Admission is frequently based on the Federal Vocational Baccalaureate.
- Universities of teacher education (UTE) are related to the UAS but organised and funded by the cantons. The admission requirement is a Baccalaureate.

114 **Proportion of 25–64 year-olds holding tertiary-level qualifications, 2007**

Selected OECD member countries

Data: OECD



Education at tertiary level in Switzerland takes place in the conventional universities and the two federal institutes of technology, the universities of applied sciences (UAS), the universities of teacher education (UTE) and tertiary level B professional education and training institutions. Courses of study at universities are grouped under category ISCED 5A at international level. Tertiary level B professional education and training, i.e. colleges of professional education and training, and Advanced Federal professional education and training Diplomas come under ISCED 5B and thus similarly belong to the tertiary level. Topics that can be allocated to a specific type of education are covered in the corresponding chapter. This overview chapter covers those topics that cannot be allocated to a specific type or for which a comparison between the different types would be appropriate. Information on tertiary level B professional education and training is thus primarily included in the corresponding chapter (→ *Chapter Tertiary-level B professional education and training (PET), page 243*).

The Swiss university sector is to be newly coordinated under the terms of the Federal Act on Funding and Coordination of the Higher Education Sector (HFKG), which is based on Art. 63a of the Federal Constitution. At the end of May 2009, the Federal Council adopted the draft for the new HFKG and the associated message. Once enacted, the new HFKG will establish the principles for federal funding and coordination activities, in keeping with the provisions of the Federal Constitution. The HFKG will replace all previous federal legislation regarding universities and universities of applied sciences, which should lead to considerable simplification and harmonisation of coordination activities relating to the Swiss university sectors. The HFKG covers common objectives and introduces new national bodies such as the Swiss University Conference, the Rectors' Conference of the Swiss Universities and the Swiss Accreditation Council with its Agency for Accreditation and Quality Assurance. It further covers the principles and procedures applying to national university-policy planning and the distribution of tasks, plus the principles of quality assurance. It similarly establishes the prerequisites for the payment of federal contributions to the conventional cantonal universities and universities of applied sciences *(SER, 2004, SER/OPET, 2006)*.

Comparison of the level of educational attainment within the Swiss population

Around 18% of working age residents (aged 25–64) in Switzerland have a university education (ISCED 5A) (→ Figure 114). Compared with other countries, Switzerland is thus in a slightly below average position, since the Scandinavian and English-speaking countries, in particular, have clearly higher percentages of up to 30%. If holders of tertiary-level B qualifications (ISCED 5B) are included, then Switzerland remains in the mid-field in an international comparison. When making international comparisons, however, it is important to consider the structure of national education systems: in Switzerland, for instance, many types of vocational training are conducted at upper-secondary level, while they are pursued at university level in other countries. In addition, the people who declare themselves to be in possession of university qualifications do not say how long they studied for. Two-year programmes can be included, in the same way as programmes lasting five years or longer.

Switzerland's tradition of tertiary-level B programmes can also be found in the neighbouring countries of Germany and France – a good 10% of working-age residents hold qualifications of this type. Among the younger generation, there are fewer holders of qualifications from tertiary level B professional education and training, since the creation of the universities of applied sciences has led to a shift towards tertiary-level 5A qualifications (→ Figure 115): the proportion of individuals in the 25–34 age bracket with a university education is eight percentage points higher than in the population as a whole. This trend is likely to continue in Switzerland, and more and more people will hold university qualifications (student forecasts, → *Chapter Universities, page 185,* and *Chapter Universities of applied sciences (UAS), page 207*). The same trend can be seen internationally, since, in nearly all OECD countries, the level of educational attainment of the younger generation is higher than that of the previous generation (→ Figure 116). However, not all countries are experiencing the same level of expansion of educational attainment among the younger generation: while France and Spain report robust growth in the number of young people obtaining tertiary-level qualifications, Austria and Germany report no significant differences between young people and the population as a whole.

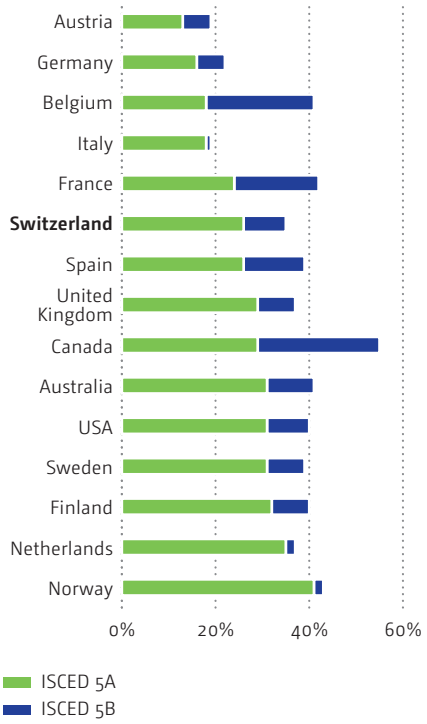
Transitions to universities

Access to universities is primarily via a Baccalaureate, although different forms of access are widespread for the universities of applied sciences and universities of teacher education (→ *Chapter Universities of applied sciences (UAS), page 207,* and *Chapter Universities of teacher education (UTE), page 225*). Of the 26,000 or so holders of a Baccalaureate who graduated in 2004, 77% chose to pursue university studies, with more than 90% of Baccalaureate

115 **Proportion of 25–34 year-olds holding tertiary-level qualifications, 2007**

Selected OECD member countries

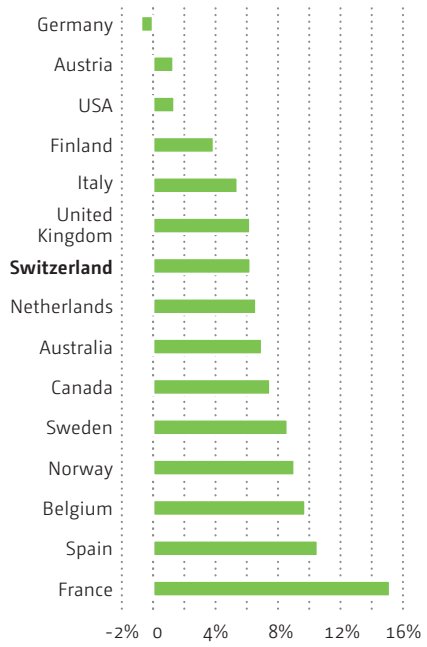
Data: OECD



116 **Difference in the proportion of young people and total population holding tertiary-level qualifications, 2007**

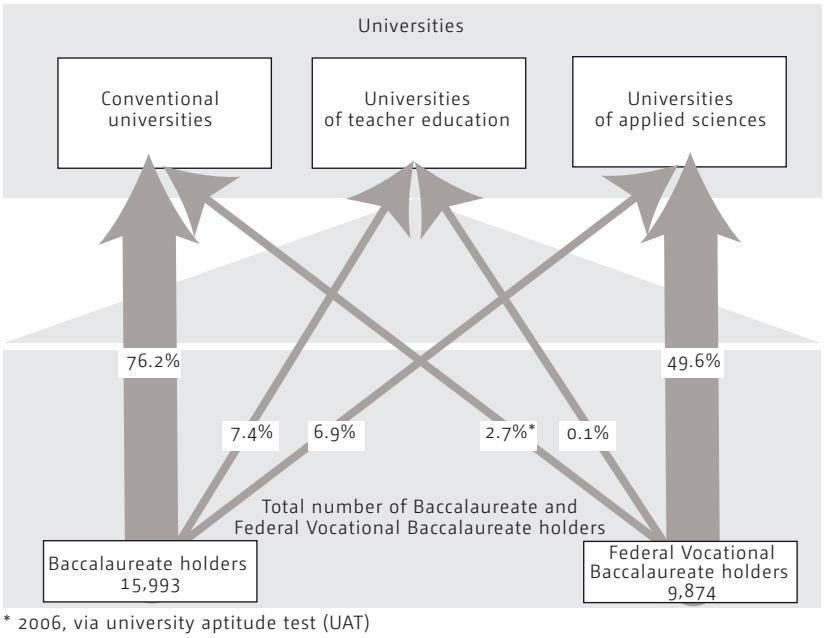
Selected OECD member countries

Data: OECD



117 **Transitions to universities, 2004 cohort**

Data: FSO



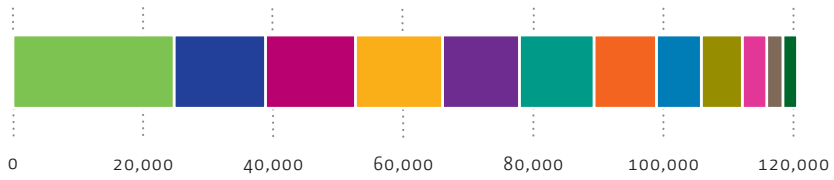
* 2006, via university aptitude test (UAT)

holders continuing their education and only around 50% of Federal Vocational Baccalaureate holders doing so (→ Figure 117; → *Chapter Vocational education and training (VET), page 141*).

In addition to the typical paths of Baccalaureate-to-university and Federal Vocational Baccalaureate-to-university of applied sciences, an additional path was opened up to holders of a Federal Vocational Baccalaureate wishing to enrol in a conventional university: the university aptitude test (UAT). In addition, holders of a Baccalaureate who have acquired professional experience can similarly study at a university of applied sciences. With the cooperation agreement signed by the Rectors' Conference of the Swiss Universities (CRUS), the Rectors' Conference of the Swiss Universities of Applied Sciences (KFH) and the Swiss Conference of Rectors of Universities of Teacher Education (COHEP) on 5 November 2007, a further condition for permeability between the different university types was created. Holders of Bachelor's degrees obtained from one type of university may switch to a different type of university for their Master's degree. The agreement specifies that additional work – corresponding to up to 60 ECTS points – may be required, depending on the subject and the university. Holders of a tertiary level B professional education and training degree may switch to a Bachelor's degree course at a university of applied sciences (UAS) receiving credits for the competences they have already acquired.

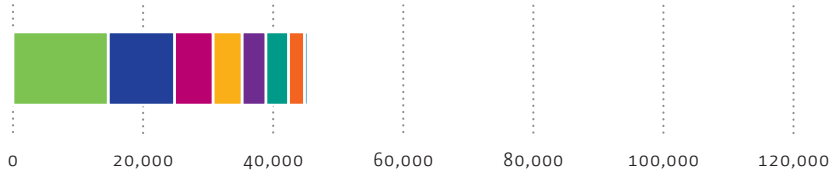
118 **Students at conventional universities, 2008/9**

Data: FSO



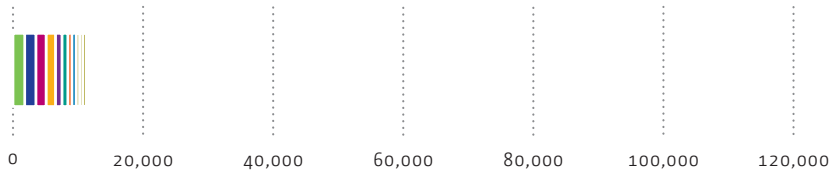
119 **Students at universities of applied sciences, 2008/9**

Data: FSO



120 **Students at universities of teacher education, 2008/9**

Data: FSO



In the 2008/9 academic year, a total of 172,595 students were enrolled in Swiss universities (excluding those in continuing education and training programmes), which is a good 30% more than in 2000. These three types of university differ substantially, not only in terms of the total size of their student body but also in terms of the size of the individual institutions (→ Figures 118 to 120). The largest university (Zurich) has more than twice the number of students of the universities of teacher education taken together.

Funding and responsibilities

All three types of universities are mostly publicly funded (→ Figure 121). Until the Federal Act on Funding and Coordination of the Higher Education Sector (HFKG) is adopted, the coordination of the different university types will be handled by the following national bodies: the Swiss University Conference (SUC), the Rectors' Conference of the Swiss Universities (CRUS), the Rectors' Conference of the Swiss Universities of Applied Sciences (KFH), the Council of the Universities of Applied Sciences and the Swiss Conference of Rectors of Universities of Teacher Education (COHEP).

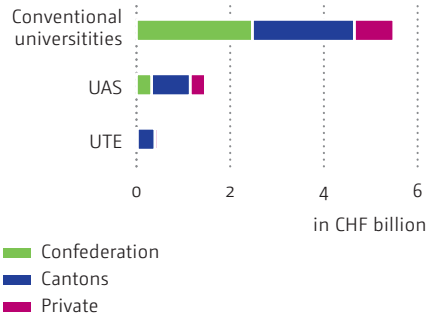
The universities are run by both the Confederation (two federal institutes of technology: ETHZ and EPFL) and the cantons (cantonal universities). The ETHZ and EPFL are funded by the Confederation, and cantonal universities are mainly funded by the cantons. According to the terms of an intercantonal agreement on cantonal universities, cantons that do not have their own university also contribute a portion of the funding needed to cover the expenses of cantonal universities. In addition, they are required to pay a lump-sum contribution for each student from their canton who enrols in a university located in another canton. The Confederation also provides its own portion of funding for cantonal universities *(SER, 2005)*.

Universities of applied sciences are supervised by the Confederation, which also pays one-third of UAS capital expenditures and operating costs. Federal funding to cover operating costs is tied to performance in the sense that it is awarded on a per-student basis and takes into account such things as the use of research findings in teaching and the acquisition of third-party funding. The remaining funding comes from the cantons where the UAS are located as well as from the contributions from the home cantons of non-resident students. These latter contributions are established within the framework of an intercantonal agreement on the universities of applied sciences.

Universities of teacher education are run and almost exclusively funded by the cantons. Funding mainly comes from the cantons where the universities of teacher education are located. There are also intercantonal contributions within the framework of the same intercantonal agreement on universities of applied sciences as mentioned in the previous paragraph. Federal funding is obtained only in the form of third-party funding of research projects conducted at universities of teacher education.

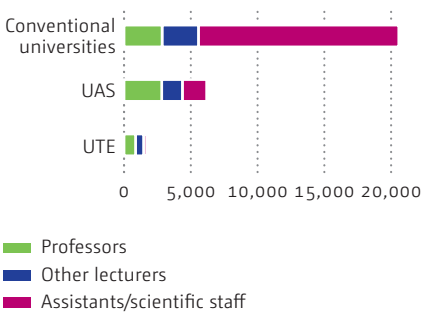
121 **University funding, 2007**

Data: FSO



122 **Academic staff at the universities, 2007, in FTE**

Data: FSO



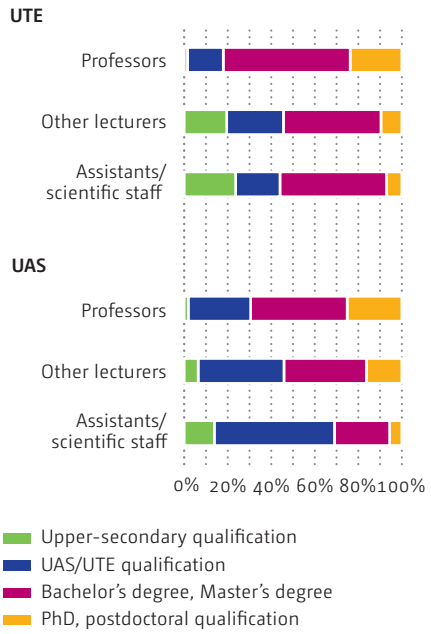
Teaching and research staff at the universities

The composition of teaching and research staff in the different university segments illustrates the different contexts and institutional characteristics

123 **Qualifications of academic staff at universities, 2007, in FTE**

Highest qualification obtained

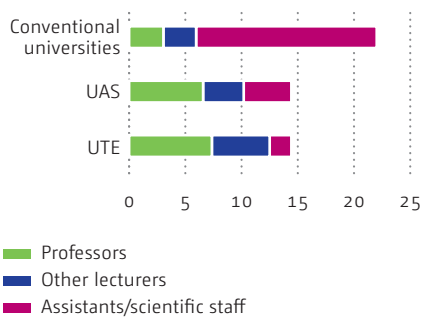
Data: FSO



While university statistics provide no information about the qualifications of their staff, the title «professor» is linked to an academic career (PhD at the very least). It is therefore a relatively easy matter to determine the minimum level of educational attainment of professors. The same holds true with assistants, since they usually need to have a Master's degree from a university before they can be hired as an assistant.

124 **Academic staff per 100 students, 2007, in FTE**

Data: FSO



of each type of tertiary-level A institution. While professors and lecturers account for 27% and assistants for just under three-quarters of the teaching staff at universities, the situation is exactly the opposite at the universities of applied sciences, where professors and lecturers account for 70% of the teaching staff. At universities of teacher education, professors and lecturers account for an even higher percentage, at 87% (→ Figure 122).

This difference in composition is justified by the different contexts in which universities, universities of applied sciences and universities of teacher education operate. For example, the category of «professor» has a different meaning depending on the type of university being referred to. This difference can also be seen in the different academic qualifications that these professors hold (→ Figure 123).

The different regulations governing the award of PhDs mean that assistants are more likely to be employed by conventional universities, since neither UAS nor universities of teacher education are authorised to issue PhDs and postdoctoral qualifications. Teaching activities at UAS and universities of teacher education are therefore mainly handled by the professors, whereas the equivalent teaching activities at universities are handled by both professors and assistants in equal measure. Data on the assistants, however, do not allow us to calculate a precise student-teacher ratio. This is because the category of «assistant» also takes in a large number of people who are employed as full-time researchers via the Swiss National Science Foundation or with third-party funding, who are not involved in teaching at all (→ Figure 124).

Origin of professors

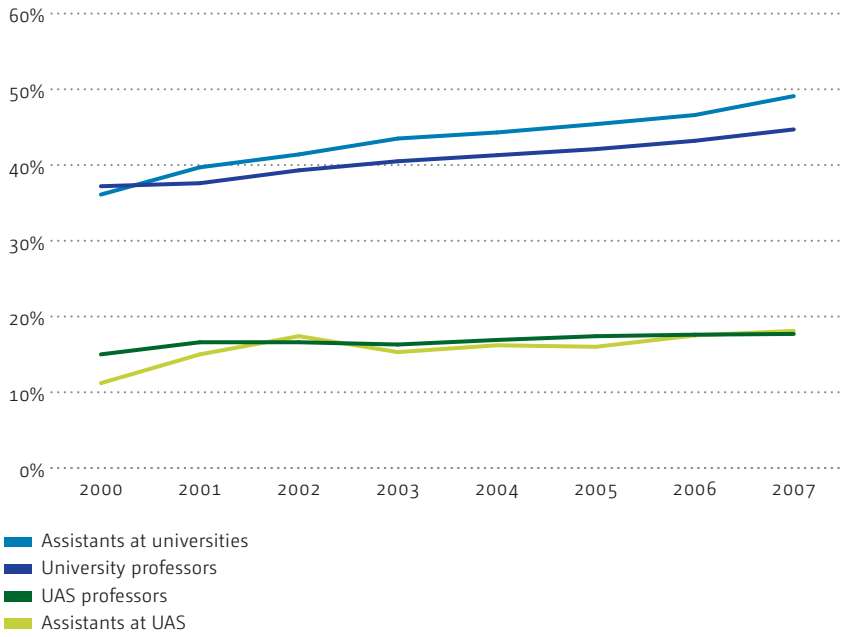
The large proportion of foreign nationals among the teaching and research staff of universities shows the great appeal of the Swiss university sector as an employer. Swiss universities have a good reputation internationally and are equally attractive to researchers, teaching staff and students. The fact that Swiss universities and UAS are able to attract so many foreign nationals is also an indication of the appeal of the Swiss job market. The salaries paid by the universities here are one-and-a-half to twice as high as those paid in Germany, for instance (see *Handel, 2005; Personalverordnungen der Kantone BE, GE, VD, ZH [Internet]*).

The proportion of foreign nationals among the teaching and research staff has risen sharply in recent years (→ Figure 125): to nearly 50% at universities and to about 20% at UAS.

It is interesting to note that the proportion of foreign nationals falling into the professor and assistant categories is equally high. Current data do not enable us to distinguish between those assistants who obtained their qualifications in Switzerland (Swiss-educated foreign nationals) and those who obtained them elsewhere (foreign-educated foreign nationals). We therefore do not know how many of the foreign nationals currently on the non-professorial teaching staff obtained their first university qualification, or even their upper-secondary level qualification, in Switzerland. Moreover, the lack of personalised statistics prevents us from determining whether teaching

125 **Proportion of foreign nationals among university staff, 2007**

Data: FSO



assistants are hired from the same country of origin as the professors they work for.

In order to assess the efficiency of Switzerland's university locations, it would be necessary to have knowledge of the jobs taken up by the next generation of academics educated here. We currently do not know whether the large number of foreign nationals working as assistants who have obtained their PhDs in Switzerland actually remain in Switzerland. Equally unclear is the extent to which public expenditure on education and research (e.g. for PhD programmes) provides a return on investment for Swiss economic and research activities, which would otherwise lead to higher expenditures for the recruitment of highly qualified workers from outside of Switzerland.

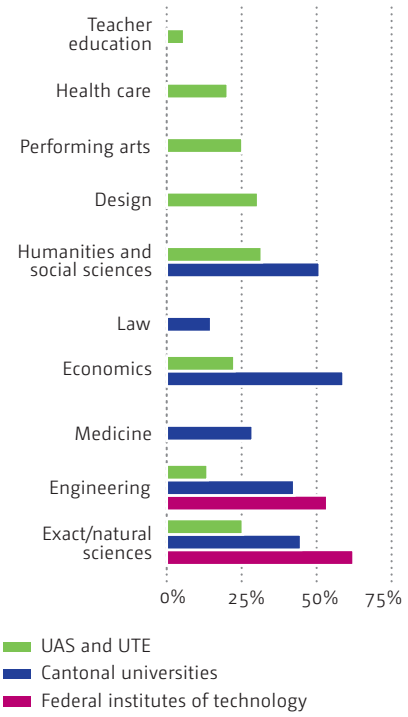
The internationalisation of professorships varies according to university type and subject (→ Figure 126). The renowned and internationally oriented Swiss Federal Institute of Technology Zurich (ETHZ) has more than 50% foreigners in its two largest specialist areas, while the figure at the universities of applied sciences barely exceeds 30%. At the cantonal universities, the subject areas of economics, the humanities and social sciences are the ones with a disproportionately high number of foreign teaching staff.

The large differences between the individual fields of study show that salary is not the only motivating factor behind the recruitment of foreign nationals. There are also differences in terms of available vacancies in the individual disciplines. The proportion of foreigners in the natural sciences and engineering is also the result of a lack of local qualification holders and the better job market options outside the academic job sector.

If we consider countries of origin, we find that the Swiss universities recruit most of their foreign nationals from neighbouring countries, with German nationals being by far the largest group of foreign nationals holding professorships (→ Figures 127 and 128).

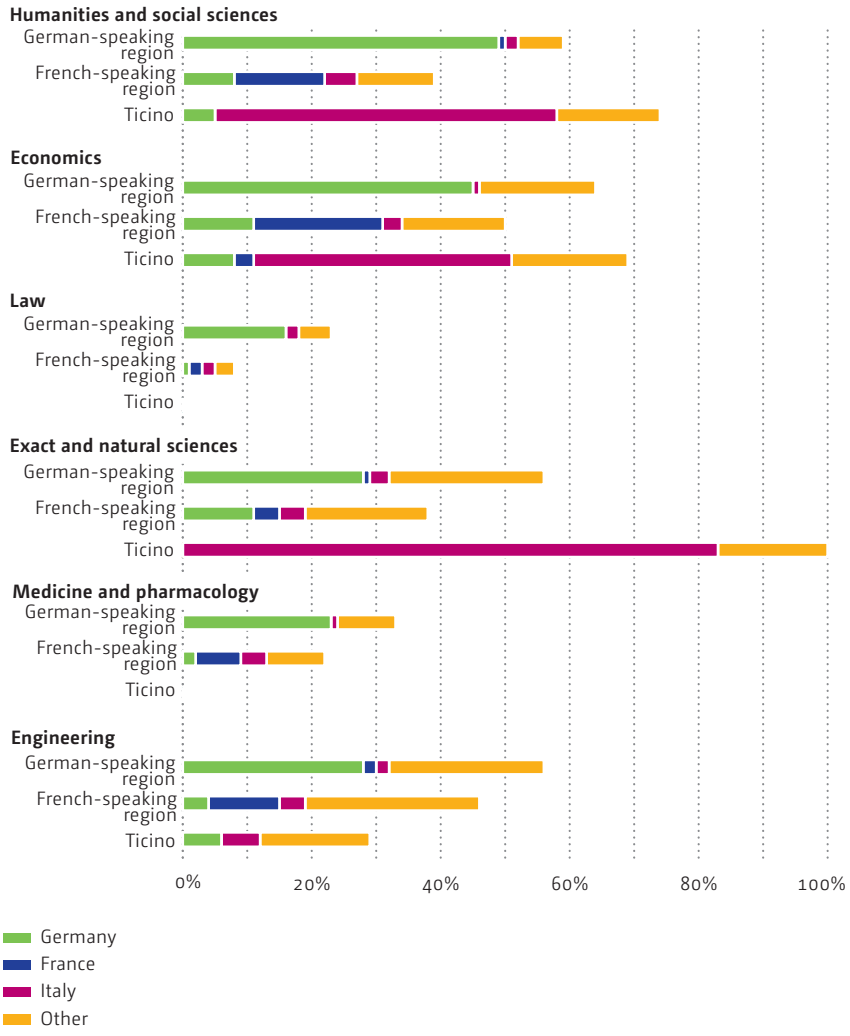
126 **Proportion of foreign nationals holding professorships, 2007**

Data: FSO



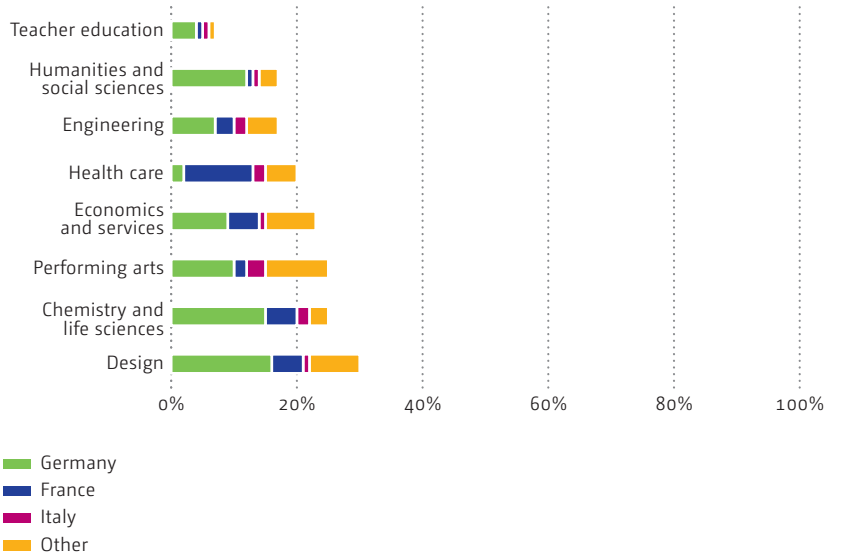
127 **Proportion of foreign nationals holding professorships by country of origin: universities, 2007**

Data: FSO



128 **Proportion of foreign nationals holding professorships by country of origin: UAS, 2007**

Data: FSO



Success on the job market

Part of the investment in university education is borne by the students themselves, since they are unable to work, or can only work to a limited extent, during their studies and also have to pay tuition fees. Most of the investment is borne by the state, however, which raises the question of whether or not a university education is worth the money invested in it.

In addition to personal development and the satisfaction of interests, there are also job market benefits to be derived from such studies. These benefits are not only felt by graduates. The state also benefits from greater participation in the job market and higher salaries, since this also increases tax revenues (→ *Chapter Cumulative effects, page 269*).

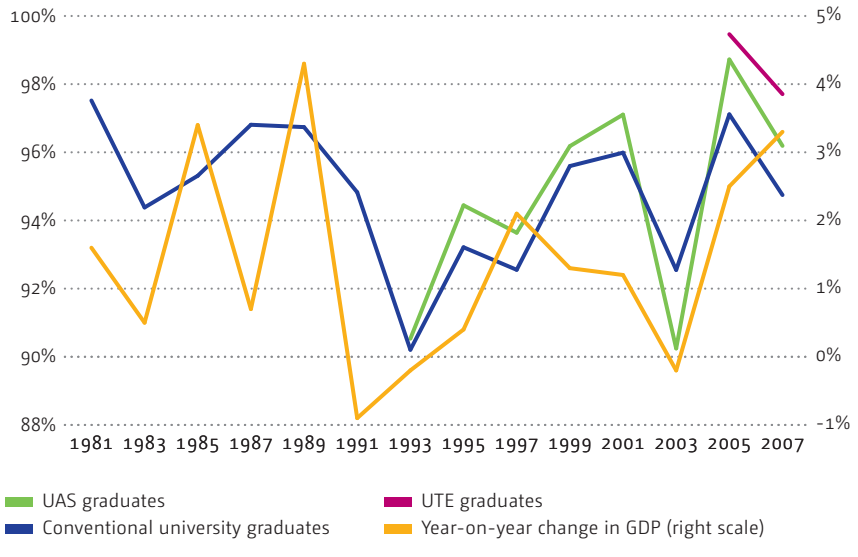
Not only are holders of tertiary-level qualifications less likely to be unemployed, they also tend to be much more active on the job market than holders of lower-level qualifications. Employment rates among holders of university qualifications one year after graduation stand at over 90% (→ Figure 129). However, this percentage depends heavily on economic fluctuations and closely mirrors GDP growth.

The employment rate among holders of a university qualification one year after graduation is slightly lower than the corresponding employment rate among holders of a UAS qualification. This state of affairs may be partially explained by the fact that degree programmes at conventional universities lack a job-market focus, and their students also tend to have considerably less professional experience than UAS students, which makes the school-to-work transition more difficult. The slightly higher unemployment rate among university graduates is only a short-term one, however, relating to the initial move into the world of work in the first few years after graduation, since later on the difference in unemployment rates between university and UAS graduates disappears. Holders of tertiary-level B qualifications have a very low unemployment rate and the highest employment rate of all tertiary-level qualification holders (→ *Chapter Tertiary-level B professional education and training (PET), page 243*).

129 **Employment rates among university graduates one year after graduation**

Self-reported employment status

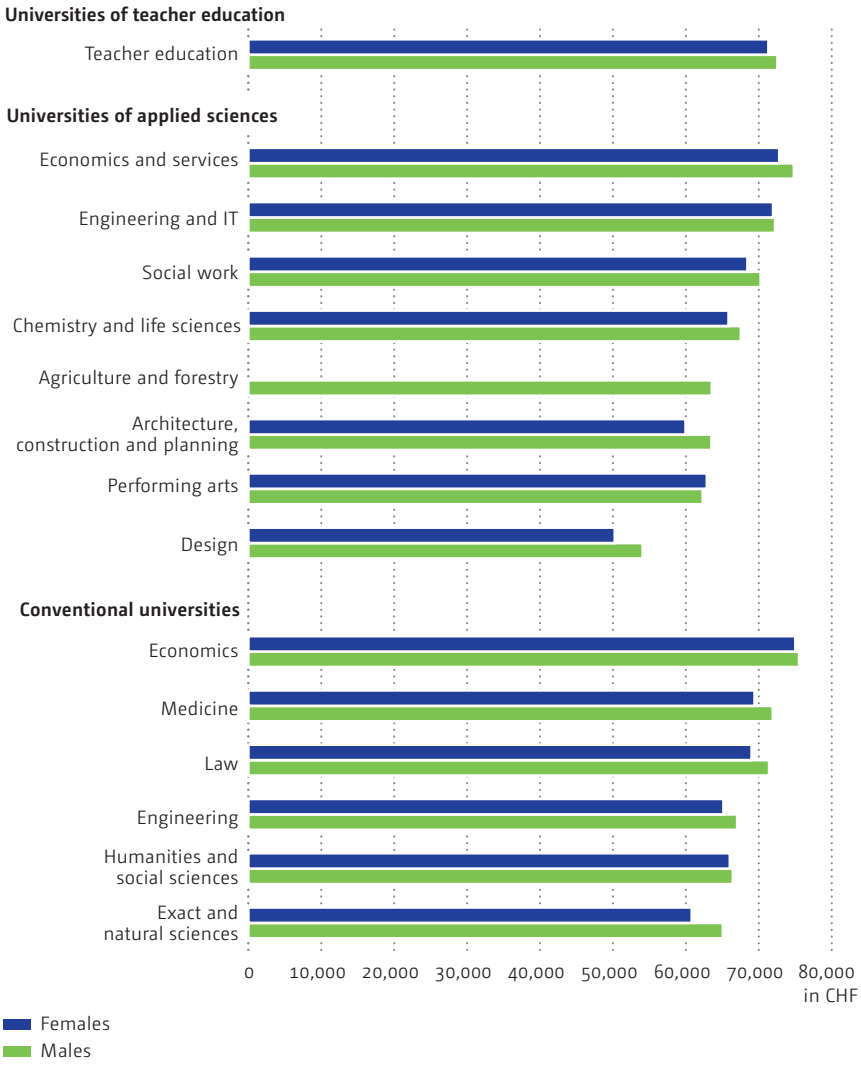
Data: FSO



130 **Gross annual salaries of university graduates one year after graduation, age-corrected, 2005**

Data: FSO

Salaries indicated here correspond to the gross annual salaries earned by 25-year-olds one year after graduating.



Holders of a university qualification earn an annual salary of between CHF 50,000 and CHF 80,000 in the first year after graduation. University and UAS graduates holding a degree in economics and university of teacher education graduates earn the highest salaries, while UAS graduates holding a degree in design earn the lowest salaries (→ Figure 130). As far as salaries are concerned, the job market hardly draws any distinction between conventional university and UAS graduates, at least not in the fields of study that are offered by both types of institution (e.g. economics, natural sciences and architecture). At first glance, this is rather surprising, since university degree programmes generally last two to three years longer than equivalent UAS degree programmes. One reason for the relatively high salaries earned by UAS graduates is their professional experience, since UAS students tend to gain experience both before and often during their studies *(Bonassi & Wolter, 2002)*. This applies particularly to the «traditional» UAS fields of study of engineering, business and services.

Not much is known about the long-term salary patterns of graduates from the different types of university, since the corresponding statistics (SLFS, SESS) do not make any distinction according to the type of university education (SESS).

Social mobility

The likelihood of a person obtaining tertiary-level A qualifications depends to a large extent on social background. Both in Switzerland and elsewhere in Europe, children of parents who hold university qualifications have much better chances of obtaining tertiary-level qualifications themselves.

There is no comparable information regarding holders of tertiary-level B qualifications. It may be presumed, however, that tertiary level B professional education and training programmes enable individuals from lower socioeconomic backgrounds to obtain a tertiary-level qualification.

In order to determine equity of access to universities, we can compare the level of educational attainment of the parents of students with the level of educational attainment in the parents' age group within the population. Equity would then be high if the distribution of qualification holders were very similar.

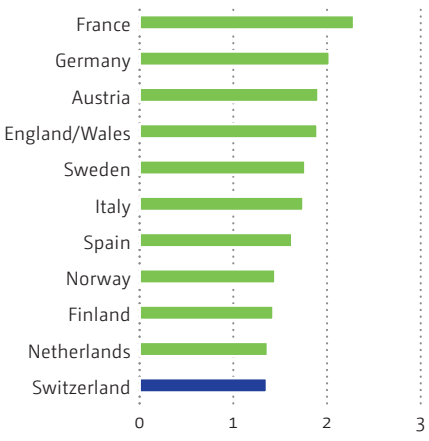
Research from the Eurostudent study *(HIS, 2008)* led to some surprising conclusions: compared to other countries, Switzerland ranks at the top when it comes to equity. The fathers of university students are «only» 1.4 times more likely to have a tertiary-level qualification than the male population in the 40–60 age bracket (⟶ Figure 131). In other European countries, and particularly Switzerland's neighbouring countries, there is a disproportionately high number of students whose fathers hold tertiary-level A qualifications.

The impact of social origin on **equal access to universities** is addressed in the chapters devoted specifically to each type of university. A consolidated international comparison is provided here because Switzerland's conventional universities, UAS and universities of teacher education cannot be compared in isolation at the international level, since the delimitation is different in different countries.

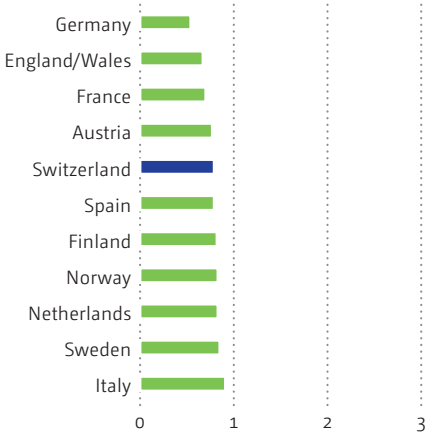
131 **Social disparity at universities, 2005**

Data: FSO

Proportion of fathers of students with tertiary-level qualifications amongst all fathers of students, divided by the number of men (aged 40 to 60) with tertiary-level qualifications amongst all men aged 40 to 60.



Proportion of fathers of students without tertiary-level qualifications amongst all fathers of students, divided by the number of men (aged 40 to 60) without tertiary-level qualifications amongst all men aged 40 to 60



Explanation

A value of 1 means that the distribution of the education stratum of students, measured in terms of the father's education, corresponds precisely to that of males in the 40–60 age group within the usual resident population. Values higher than 1 indicate overrepresentation of the corresponding education stratum, while values of below 1 signify an underrepresentation of the corresponding education stratum (⟶ Figure 131).

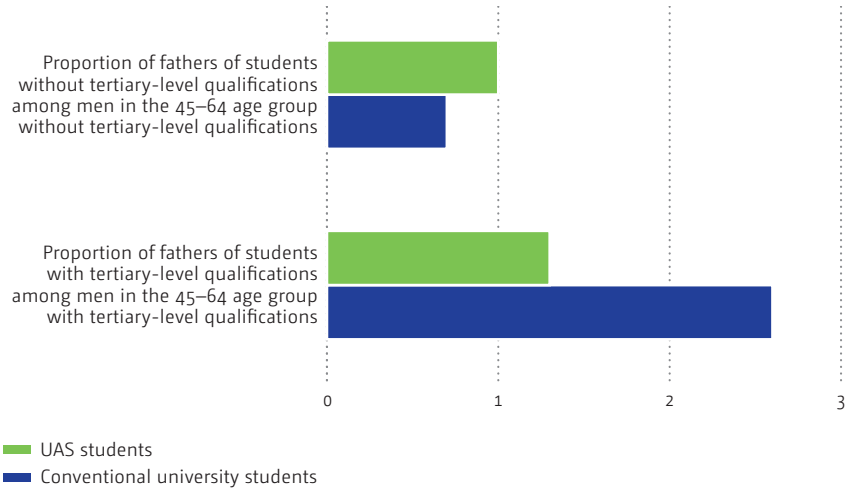
When comparing measures of social disparity, we need to consider the impact of the reference group's size: the smaller the reference group, the stronger the educational opportunity indicator will respond to unequal distributions. Example: in Switzerland, 37% of the males in the 40–64 age group hold a tertiary-level A qualification. In Italy, the corresponding percentage stands at only 11%. In both countries, the proportion of students coming from a highly educated stratum (i.e. fathers with tertiary-level qualifications) is higher than in the reference population (CH: 51% vs. 37%, I: 19% vs. 11%). Although the extent of overrepresentation is 14 percentage points in Switzerland and only 8 percentage points in Italy, the relative measurement figure for Italy is much higher, given the smaller size of the reference group (Italy: 19 : 11 = 1.72; Switzerland: 51 : 37 = 1.38).

Switzerland fares less well when students whose fathers lack tertiary-level qualifications (i.e. lower or average level of educational attainment) are considered. The students whose fathers lacked tertiary-level qualifications are under-represented in all of the countries surveyed. Switzerland only ranks in the middle here (→ Figure 131).

Leaving operationalisation considerations aside, the influence of social background on the likelihood of a person reaching tertiary-level A qualifications has decreased over the past thirty years *(Cattaneo, Hanslin & Winkelmann, 2007)*. The strong expansion of UAS studies has very much contributed to this trend. As Figure 132 clearly shows, inequality is much more apparent at conventional universities than at UAS: the distribution of the education level of the fathers of conventional university students differs greatly from the distribution of the education level of the corresponding age group within the reference population. By contrast, the distribution of the education level of the fathers of UAS students differs very little from the corresponding age group in the population. Students at conventional universities are more than twice as likely to have fathers with tertiary-level A qualifications. This finding is confirmed when we compare the education level of their mothers with the education level found among women of the resident population in the 45–64 age group.

132 **Social disparities at UAS and conventional universities, 2005**

Data: FSO



Universities

Context

In 2008, a total of 93,410 students were enrolled in *Diplom* or Bachelor's or Master's degree programmes at Switzerland's ten cantonal universities and two federal institutes of technology (ETHZ and EPFL). The number of students enrolled is of central importance for the universities. Not only does the number of students have an impact on schedules and infrastructures, but it also determines the amount of funding received by cantonal universities: the basic federal funding is provided on a per-student basis, and cantonal universities also receive compensation payments from the student's home canton.[1] The number of students enrolling in a university depends on four factors: the number of people in the corresponding age group (demographics), the structure of upper-secondary level feeder schools (number of Baccalaureates), the general inclinations of admissible students and the competitive position of a given university with respect to comparable institutions elsewhere (in Switzerland or abroad). The university itself thus has direct influence over only one of these four factors.[2]

Demographics

Published in 2008, the OECD's «Higher Education to 2030 (Vol. 1): **Demography**» report provides a comprehensive analysis of future demographic influences on the universities *(OECD, 2008b)*.

While the population in the 20-25 age bracket has grown at an annual rate of about 1% over the past few years, the total number of students enrolled in universities has risen at a higher percentage rate (→ Figure 133). This means that the universities are faced with a situation where an increasing proportion of young people are interested in obtaining university qualifications. The Federal Statistical Office (FSO) estimates that around 4% more students per year will enrol in universities over the next few years *(FSO, 2008c)*. Based on prognoses, there should be a sharp decline in 2014: the number of people in the 20–25 age bracket will decrease, and it is unlikely that there will be a corresponding increase in general aptitudes to compensate for this. Universities will need to devise strategies to deal with this demographic change so as to be able to counter the reduced utilisation rate of their infrastructure and the decline, or shift, in student-based financial contributions.

Bologna Reform

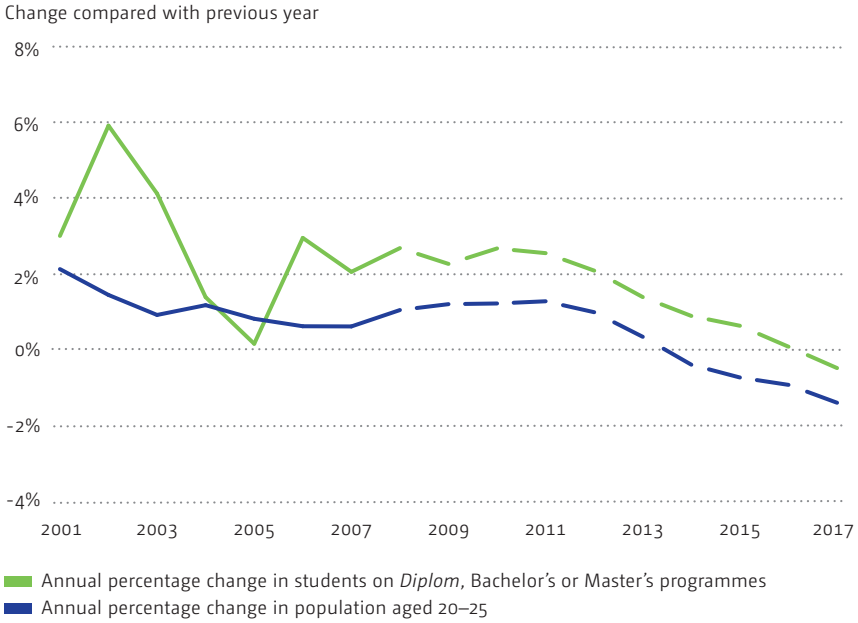
With the implementation of the Bologna Reform process at the start of the 21st century, universities switched to a two-tiered qualification structure: after obtaining a Bachelor's degree (about six semesters), students can continue their studies and obtain a Master's degree after an additional 3–5 semesters (→ *Institutions, page 188*). At the time, the lack of experience with two-tiered qualification structures made it impossible to anticipate how students would respond to the new system. Since then, around 85% of students have enrolled in Bologna Reform-based degree programmes (information

1 The canton where the student legally resided when he/she obtained the school-leaving certificate admitting him/her to university.

2 Many Swiss nationals choose their university on the basis of geographical criteria, which limits competition between universities (see *Denzler & Wolter, 2010*).

133 **Students at conventional universities and demographic change**

Data: FSO



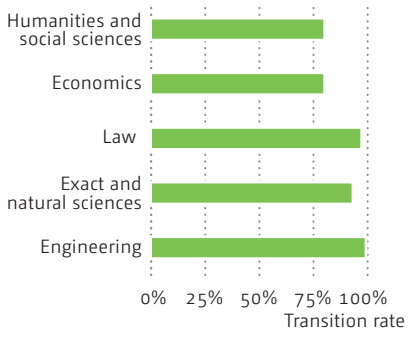
on the current status of the Bologna Reform process can be found in *SER/OPET, 2008*), and initial statistics on their study paths are now available. Nevertheless, it is still not possible to determine whether the Bologna Reform process has made university studies more attractive in Switzerland. This is because the massive increase in the number of students in 2002 and 2003 is mainly the result of two school years taking the Baccalaureate simultaneously in various cantons.[3]

Initial FSO estimates indicate that most Bachelor's degree holders enrol in a Master's degree programme: around 87% do so immediately after graduation or after one or two years. The current data situation does not enable us to determine if these Bachelor-to-Master transition rates differ not only from one area of study to another (→ Figure 134) but also from one university to another. It will take a few more years to determine whether the choice to continue their studies after Bachelor's degree level is affected by the economic situation or by the situation on the job market. The introduction of a two-tiered qualification structure was also intended to facilitate the mobility of students between universities. So far, around 10% of the students enrol in a Master's degree programme at a different university from the one where they obtained their Bachelor's degree.

134 **Bachelor-to-Master transition rate, 2007**

The transition rate measures the proportion of students who enrolled in a Master's degree programme at a university either immediately after completing their Bachelor's degree programme or within a year of so doing.

Data: FSO



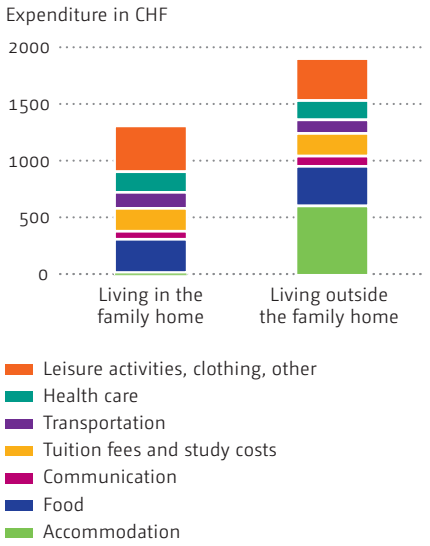
Student living conditions

Study habits and the successful outcome of studies do not depend solely on general institutional factors; student living conditions also have an impact

3 *Cappellari and Lucifora (2008)* nevertheless observed that, in Italy, the likelihood of enrolling in a university increased by 10% after the Bologna Reform process. *Cardoso, Portelo, Sá et al. (2006)* found the same effect in Portugal.

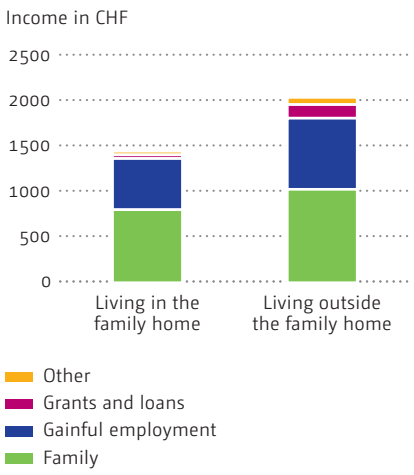
135 **Monthly expenditure of conventional-university and UAS students, 2005**

Data: FSO



136 **Monthly income of conventional-university and UAS students, 2005**

Data: FSO



on study duration and performance *(DeSimone, 2008; HIS, 2008; Warren, 2002)*. In Switzerland, 78% of university students are in gainful employment; half of these students state that they work «out of financial necessity» *(FSO, 2007d)*. Although tuition fees are relatively low (→ *Institutions, page 188*), university studies are anything but free of charge: on average, students require CHF 1,300 each month (→ Figure 135) to cover their living expenses (if they still live with their parents).

Students receive income of around CHF 1,400 (→ Figure 136) partly from their families, but only in rare cases will support from the family cover the full amount. Many students therefore find it an economic necessity to engage in paid employment alongside their studies, and this paid employment covers about half of their financial needs on average. Switzerland ranks in the middle compared with other countries – in the Slovak Republic, for instance, gainful employment covers 90% of the student budget, whereas in Ireland it only covers 19% *(HIS, 2008)*.

However, the high financial requirements of Swiss students for covering their living expenses also show the limitations of part-time work. If other sources of income were lacking, then students living away from the family home would have to work in a 60% job during their studies (depending on their prior education and training and the situation on the job market) in order to cover their monthly living expenses of nearly CHF 2,000. Only in very few cases would such a percentage be compatible with their studies. Most students therefore depend on money from their family or on student grants.[4]

It is also important to note that, according to guidelines issued by the Swiss Conference on Social Aid and Welfare (SKOS), single persons require a monthly income of CHF 960 to cover basic necessities, and this amount does not yet cover the costs of rent, insurance and medical care. The CHF 1,300 or CHF 2,000 that students require each month is therefore only enough to cover minimal needs.

Institutions

As mentioned earlier, studies at Swiss universities are now based on a two-tiered Bachelor's/Master's degree structure. Bachelor's degree programmes are intended to provide students with basic academic and methodological knowledge so that they can work in academic and/or research-based fields. Master's degree programmes, which may be followed at a different university and even in a different field of study, are intended to provide students with more in-depth expertise and a certain amount of exposure to research.

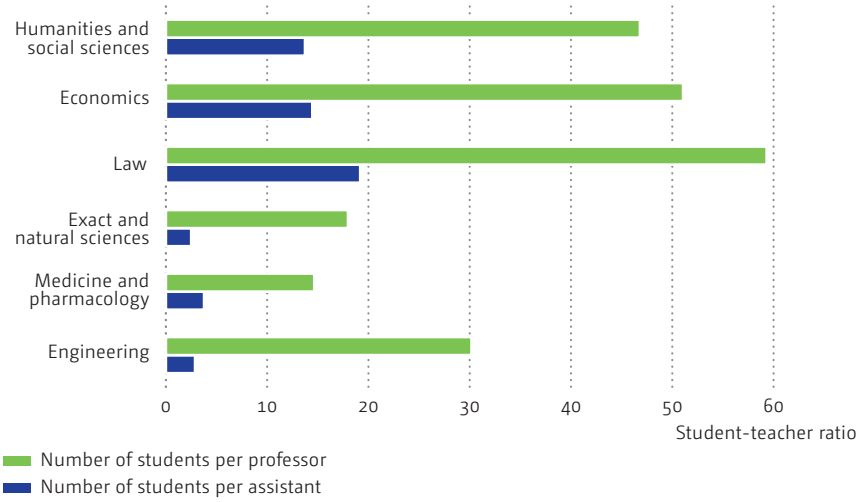
Staff and student-teacher ratios

Classes are taught by professors, on the one hand, and by a large number of other lecturers and assistants, on the other. As far as student-teacher ratios

4 The financing required for a five-year Bachelor's-to-Master's degree programme is around CHF 120,000.

137 **Licentiate, Bachelor's and Master's students per member of teaching and research staff (in FTE), 2007**

Data: FSO



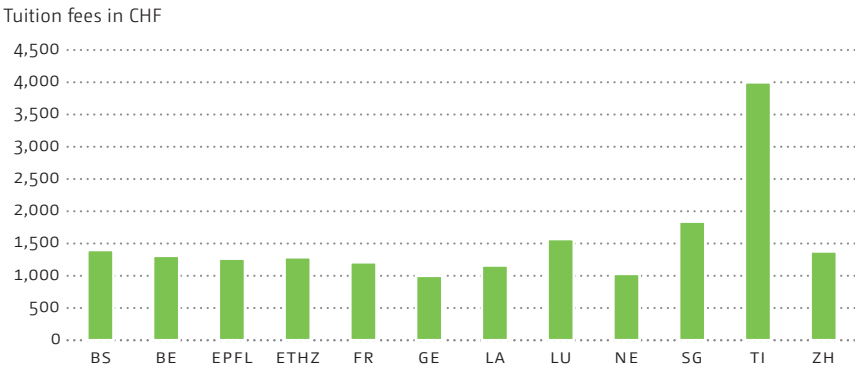
are concerned, a distinction can be drawn between two main study categories: in law, economics, humanities and social sciences, there is one professor (FTE) for over 45 students; in all other fields of study, the ratio is one professor (FTE) for up to 30 students; and, in medicine, the ratio is even one professor (FTE) for only 15 students (→ Figure 137). It is not the case, as one might expect, that less intensive supervision by professors is offset by a large number of assistants; instead, the assistants in the subject areas in the first group are responsible for at least three times as many students as their colleagues in subject areas in the second group. Student-teacher ratios in humanities and social sciences have repeatedly given rise to numerous discussions. Over the past decade, this field of studies category has experienced the greatest increase in the number of students without any corresponding increase in teaching staff. It is unclear how much of an impact student-teacher ratios have on study progression and success (→ *Efficiency/Costs, page 196*).

Funding

The funding of cantonal universities comes from the following sources: the canton in which the university is located; contributions provided by other cantons within the framework of the intercantonal agreement on cantonal universities; federal funding to cover operating expenses, capital expenditure and projects; third-party funding, including tuition fees *(Schmidt, 2008)*.[5] At most cantonal universities, tuition fees are between CHF 1,000 and CHF 1,500 per year. Only the University of Lugano (USI) charges considerably more, at CHF 4,000 (→ Figure 138). Since tuition fees are the same regardless of the field of study, student contributions to their studies vary to a very large extent: a student enrolled in social sciences at the University of Zurich

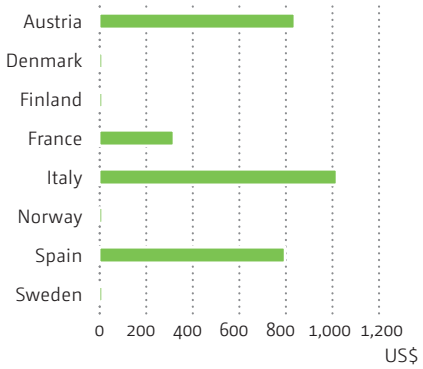
5 Switzerland's two federal institutes of technology obtain funding from both the Confederation (general budget allocation) and third parties (e.g. tuition fees).

138 **Annual tuition fees at conventional universities, 2007/8**
Data: FSO



pays roughly 10% of the annual costs of their studies (CHF 1,400 tuition fee compared to CHF 10,000 for teaching and CHF 4,000 pro-rata for research).[6] By contrast, one year of dentistry studies at this same university costs nearly CHF 60,000 (including CHF 35,000 for teaching), which means that dentistry students only contribute about 2% of the annual costs of their studies.

139 **Average annual tuition fees in US$, 2004/5**
Only public institutions
Data: OECD



In the United Kingdom, universities set their own **tuition fees**. In Germany, tuition is free in some federal states but, in others, tuition fees can be up to EUR 650 per semester. In the United States, universities establish their own tuition fees. Annual tuition fees in the US range from USD 2,000 to USD 37,000, with the average being somewhere between USD 12,000 and USD 16,000.

Certain English-speaking countries have adapted tuition fees to reflect the true cost of studies, a practice that has received attention in the Swiss media. If such a measure were to be taken in Switzerland, the impact would be felt quite differently depending on the field of study. Although there are no figures on the annual cost of medical studies, it is reasonable to assume that students would be required to pay over CHF 50,000 a year in order to cover the true costs of their studies. If, in a system that has students pay the full cost of studies, tuition fees were not based on the actual costs of a given field of study, then the result would be cross-subsidisation between fields of studies. And, as experience abroad has shown, such cross-subsidisation would require additional compensatory instruments.

Tuition fees currently account for only one-tenth of monthly per-student expenditure (→ *Context, page 186*). If students were required to pay the full cost of their studies, then this would have a major impact on student finances, and if the additional cost were not compensated by a broader system of student grants or loans, students would need to draw considerably more financial resources from their families or increase their level of paid employment.[7] It is very likely that demand for higher education would be affected if students were required to bear a greater burden of the costs of their studies (even though not all students would be affected in the same way). Assuming that the relative salaries of qualified workers remained constant, the return on investment in education and training (calculated by comparing the costs of studies with the income achieved after one's studies) would decrease considerably. Since young people tend to pay close attention to the financial consequences of their choice of education and training *(Wolter & Weber,*

6 For a definition of pro-rata research see *FSO, 2009b*.
7 An extensive discussion of the various systems used to fund university education can be found in Barr (2004).

2003), a substantial increase in tuition fees would probably lead to a fall in demand for higher education. A survey of admissible students in Germany conducted by *Heine, Quast and Spangenberg (2008)* showed that just under 4% of the admissible students chose not to enrol in higher education because tuition fees were introduced.[8]

In order to maintain the demand for higher education, and thus ensure that the number of highly qualified workers remains constant, the relative salary structure would need to be adjusted to take the higher tuition fees into account. In other words, holders of university qualifications should be able to earn considerably higher salaries than less qualified workers over the course of their careers than is currently the case. However, this would create income disparities among gainfully employed persons that would be considered socially unacceptable.

Effectiveness

The effectiveness of university education can be measured on the basis of various criteria. Two important indicators used to assess university performance include the absolute number of graduates and the proportion of university entrants who successfully complete their studies, but these are not reliable indicators for the effectiveness of the universities. Since the purpose of university studies is to provide students with the right skills, it certainly makes sense to assess the effectiveness of university teaching on the basis of university students' success on the job market as well (→ *Chapter Tertiary-level education, page 171*).

Graduation rates

Around 70% of university entrants at cantonal universities and federal institutes of technology complete their studies. In humanities and social sciences, the graduation rate is about 60%. The graduation rate has barely changed over the past 20 years, despite the fact that the number of university entrants has increased by one-third. The graduation rate, however, cannot be taken as the only measure of effectiveness of a given degree programme or university, because effectiveness depends both on the university's adopted strategy and on the composition of the student body. While a low graduation rate can certainly be considered an indication of stringent quality criteria within a given degree programme, it may also be an indication that a given degree programme draws only low-level students or that a given university does not adequately guide and educate students. These problems doubtless arise in Switzerland in some cases, since universities are not permitted to select their students (for more details, see the explanations provided in the Swiss Education Report 2006, *SCCRE, 2006*). In countries where universities ap-

8 *Hemelt and Marcotte (2008)* estimate that a USD 100 increase in tuition fees leads to a corresponding 0.25% decrease in university enrolment.

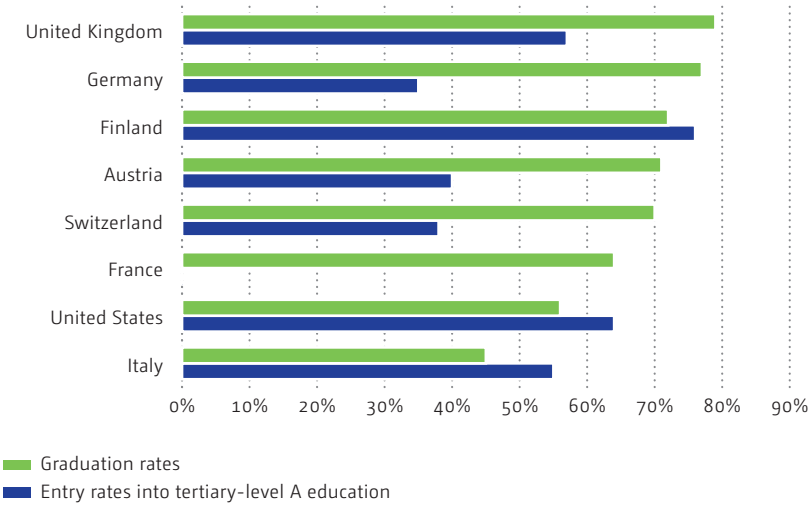
ply stringent selection procedures (e.g. in the USA), there is a strong correlation between graduation rates and selection: graduation rates are high at renowned universities and low at less renowned ones.

Compared to other countries, German-speaking countries have lower enrolment rates at tertiary-level A and relatively high graduation rates. While over half of all 20-year-olds in Italy and the USA enrol at a university, graduation rates are considerably lower (→ Figure 140)

140 **Graduation rates and entry rates into tertiary-level A education, 2005/6**

Data: OECD

France: no data on enrolment rates



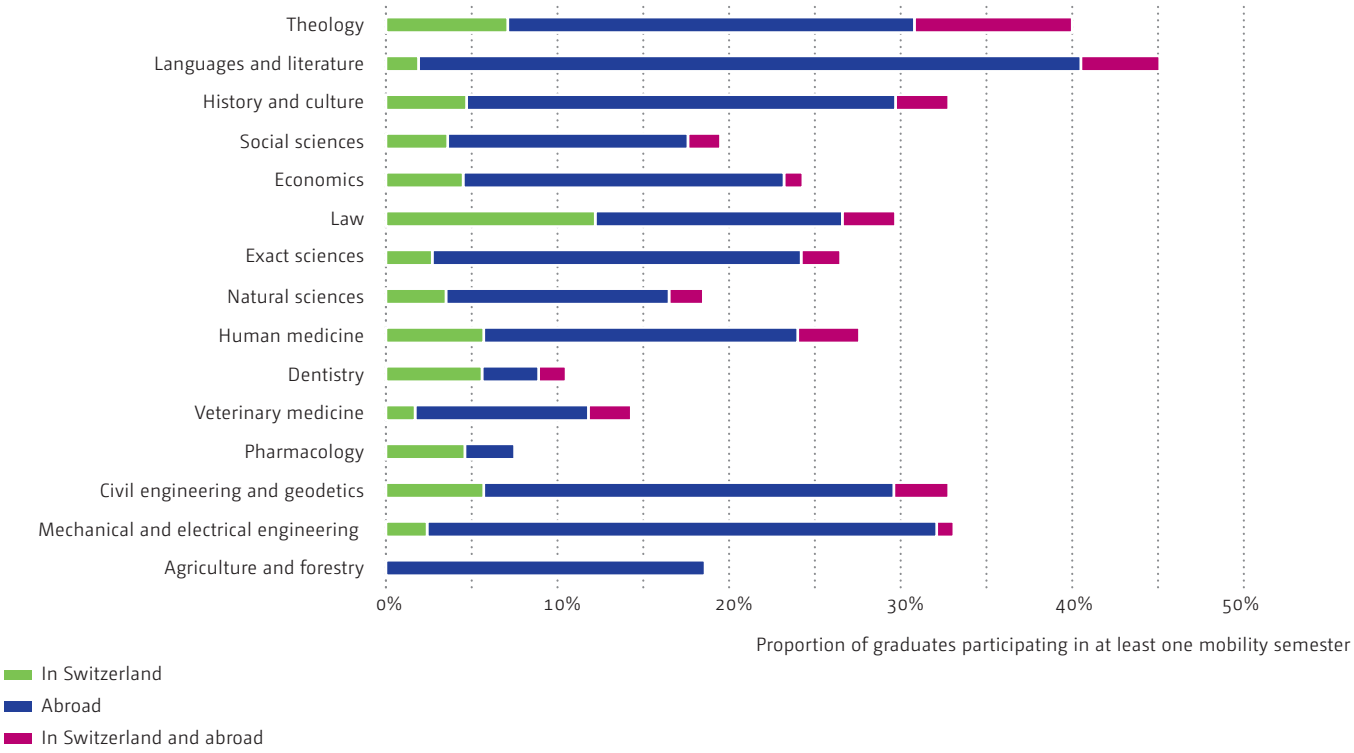
Mobility

One of the stated objectives of the Bologna Reform process was to facilitate the national and international mobility of students. The Rectors' Conference of the Swiss Universities (CRUS) conducted a survey of mobility patterns after the Bologna Reform. According to the findings of this study, over 60% of the students who chose not to take advantage of the mobility option gave as one reason the excessive administrative procedures associated with taking an exchange semester *(CRUS, 2009)*. Since no similar studies were conducted prior to the Bologna Reform, there is no way of determining whether the Bologna Reform led to greater or fewer administrative hurdles.

Exchanges between universities should improve the quality of education and research. In addition, graduates should gain skills (versatility, language skills) that will improve their career prospects either on the job market or within academia. In their study, *Messer and Wolter (2007)* did not find any indication that university graduates in Switzerland who had engaged in exchanges were more likely to earn higher salaries or pursue doctoral studies. *Parey and Waldinger (2008)* found that previous exchange students were considerably more geographically mobile. This cause and effect relationship was also confirmed in a Dutch study *(Oosterbeek & Webbink, 2006)*. A comprehensive study of exchange students' own perceptions as well as those of employers was also conducted by *Bracht, Engel, Janson et al. (2006)*; both

141 **Mobility rates among university students, graduation class of 2006**

Data: FSO



university graduates and employers tended to perceive the skills of former exchange students as being higher. Nevertheless, this effect may also be a purely selective effect: the students themselves decide whether they wish to take part in an exchange semester. It therefore stands to reason that exchange students do not fall into the same category as non-exchange students, as shown in the study conducted by *Messer and Wolter (2007)*.

It would seem that, even after implementation of the Bologna Reform, mobility depends primarily on the chosen field of studies: while there are very few exchange students in the pharmacology branch, nearly half of all students enrolled in language studies have been on an exchange semester.[9]

Skills and qualifications

One of the main purposes of a university education is to provide graduates with skills that they will need in their future (professional) lives. It is not only the university qualification as a piece of paper that influences the level of job satisfaction and salary but rather the skills that one acquires while working towards the university qualification *(Garcia Aracil & Van der Velden, 2008)*. The FSO conducted a comprehensive study on key skills in order to determine whether the skills gained through university studies matched the actual needs of the job market. The conclusion drawn is that «university graduates have not only gained the necessary specialist knowledge but more

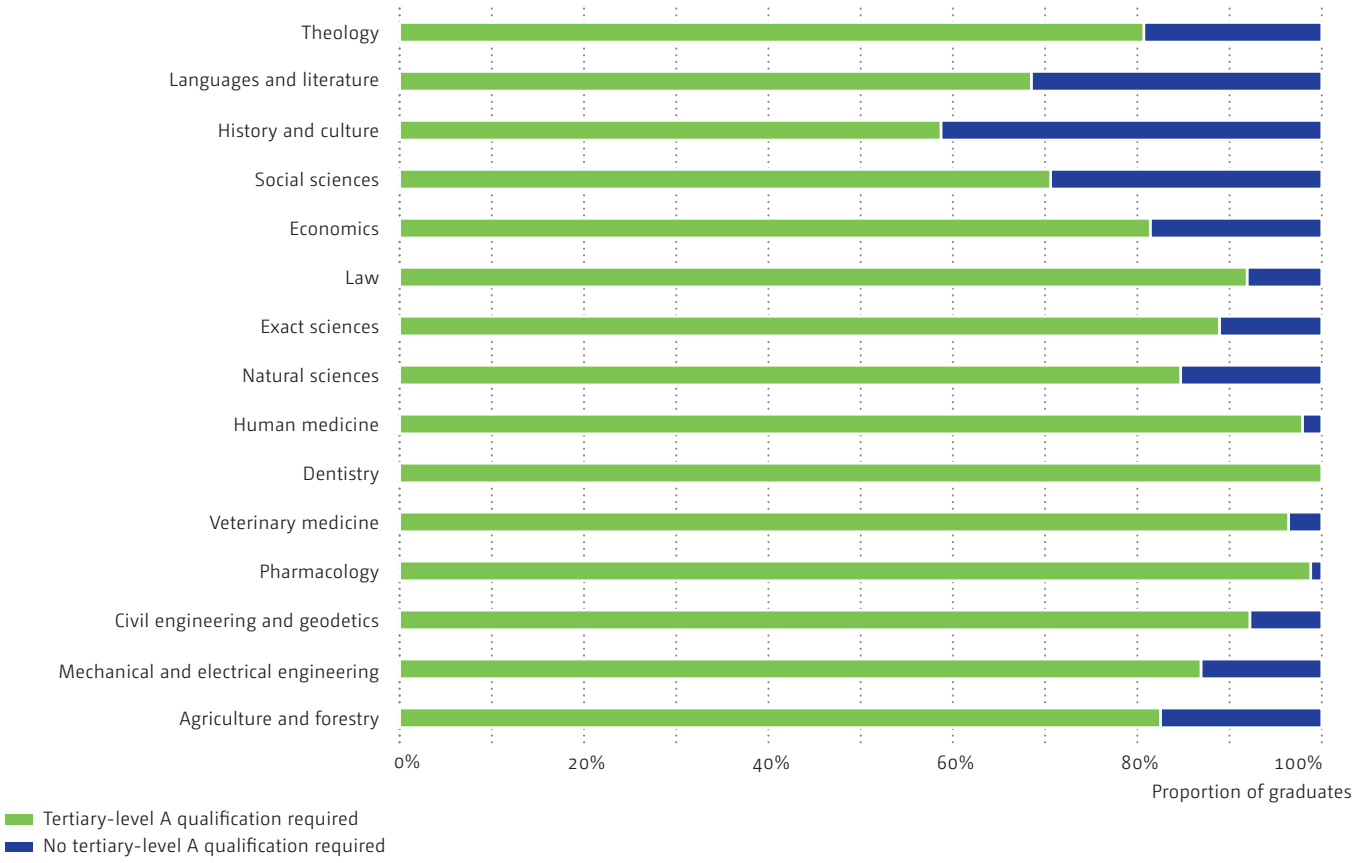
9 An exchange semester in a region where the language concerned is spoken is normally compulsory in many language study programmes.

than half of them are also satisfied with the level of interdisciplinary skills acquired (…)» *(FSO, 2008k)*. It is important to note that these findings are based on the university graduates' own perceptions, and so far no studies have been conducted to determine exactly what skills were acquired. The OECD's Assessment of Higher Education Learning Outcomes (AHELO) project seeks to draw international comparisons between the skills of university graduates. A corresponding feasibility study will be commissioned at the end of 2009.

In addition to the problem of whether the skills gained match actual needs, we also need to know whether university graduates find appropriate employment after graduation, i.e. whether the job they find matches their qualifications. Figure 142 shows that most university graduates find appropriate employment; only in a number of humanities and social science subjects are there a large number of graduates in a job not requiring a university qualification. This «overqualification» goes hand in hand with lower salaries *(FSO, 2008f)* as foreign studies conducted on this subject have long demonstrated (e.g. *Di Pietro & Urwin, 2006*). The proportion of university graduates without appropriate employment has not changed substantially in Switzerland over the past few years *(FSO, 2007c)*. This seems to indicate that the expansion of tertiary-level education has been accompanied by a corresponding increase in the need for academically qualified personnel; Switzerland's university sector and its job market seem to be well matched to each other. *Barth and Lucifora (2006)* draw similar conclusions for twelve EU member states.

142 **Employment qualification requirements, one year after graduation, 2006**

Data: FSO



University ranking lists

Over the past few years, university ranking lists have attracted increasing attention in the media and among politicians and even the universities themselves frequently use them to make statements on their quality. Rankings depend on how quality is defined, what indicators are used to measure quality, the weighting of each indicator, the methods used to measure indicators, and the manner in which findings are presented. Depending on the method used, the same institution may find itself in an entirely different position on various ranking lists. There is a major difference between ranking a university on the basis of how many alumni have been awarded a Nobel Prize (e.g. the Shanghai Jiao Tong University's «Academic Ranking of World Universities») and ranking a university on the basis of student-teacher ratios (e.g. the Times Higher Education Supplement's «World University Rankings»). Ranking lists that give 40% weight to the research output indicator (i.e. Shanghai ranking list) will produce different results from ranking lists that give 20% weight to this same research output indicator (i.e. THES ranking list).[10] Universities with a strong orientation towards the natural sciences will also tend to score higher on these ranking lists, given that the Shanghai ranking list, for example, focuses almost exclusively on research indicators from the natural sciences.

Although ranking lists tend to judge universities on the basis of the quality of research, the current research literature suggests a positive correlation between the quality of research and the quality of teaching. While the structure of the various ranking lists does not enable one to judge the relative quality of a university definitively on the basis of its ranking, the ranking lists do provide interesting indications of the relative effectiveness of the university systems in individual countries.

Most of the top-ranked universities listed in the most commonly consulted Shanghai and THES ranking lists *(→ infobox to the right)* are located in the USA.[11] However, if we consider, as *Aghion (2007)* did, the proportion of all students who are enrolled in a top-ranked university in their country, we find that Switzerland is world-class. Over 50% of all Swiss students attend a top-200 university (Shanghai ranking list), while only around 20% do in America (→ Figure 143).[12] It is important to note that this proportion would be even higher if only full universities were taken into consideration.[13]

In this sense, Switzerland's university sector is very effective, since a majority of students (unlike in most other countries) are able to study at a university that provides internationally recognised research results.

Rankings: criteria and weighting

Shanghai Jiao Tong University's «Academic Ranking of World Universities» (Shanghai ranking list):

- Alumni with Nobel Prizes (10%)
- Staff with Nobel Prizes (20%)
- Highly cited researchers (20%)
- Papers published in «Nature» and «Science» 2003–2007 (20%)
- Papers indexed in SCI and SSCI 2007 (20%)
- Per capita academic performance (on the indicators above) (10%)

Times Higher Education Supplement «World University Rankings» (THES ranking list):

- Peer review: review by leading scholars (40%)
- Reputation among recruiters (10%)
- Citations per faculty member (20%)
- Teacher-student ratio (20%)
- Number of international faculty members (5%)
- Number of international students (5%)

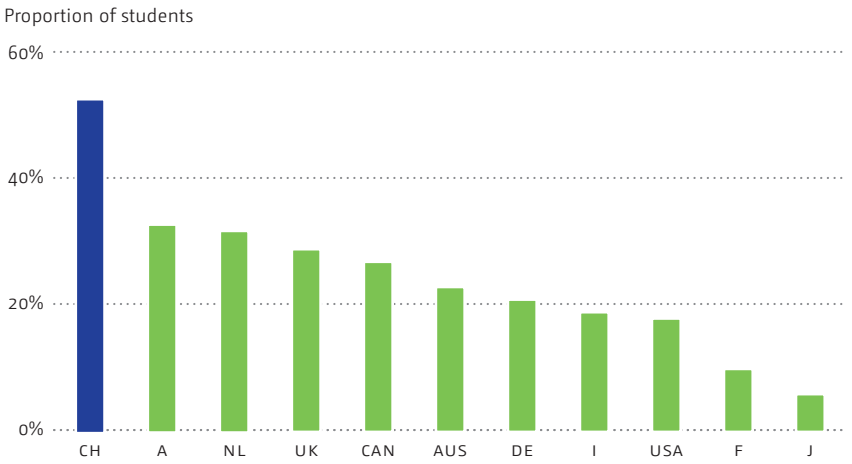
10 Detailed discussion and references can be found at: www.universityrankings.ch

11 US-based universities make up half of the universities listed in the «Shanghai 200 Ranking».

12 In the THES ranking list, Switzerland only achieves a somewhat poorer score vis-à-vis Australia and the United Kingdom, by comparison with the Shanghai ranking This can be explained by the fact that the THES ranking list is somewhat biased in favour of English-speaking universities.

13 Universities focused on a specific field, such as the University of Saint Gallen, the University of Lugano, or the University of Lucerne, have no chance of achieving a high score in either of the two main ranking lists.

143 **Proportion of students enrolled in a top-ranked university, 2007**
Data: www.universityrankings.ch, national statistics offices. Calculations: SCCRE



Efficiency/Costs

In order to determine whether universities make efficient use of funding, we must first reach a consensus on an appropriate indicator to measure output (and hence effectiveness). Economic researchers have, in recent years, developed methods for comparing inputs with outputs for purposes of measuring efficiency.[14] The output is generally taken to be the qualifications awarded or the qualifications with a specific grade (since data are available on this). These calculations primarily permit a comparison to be drawn between universities and are not an assessment of the general efficiency of the system.

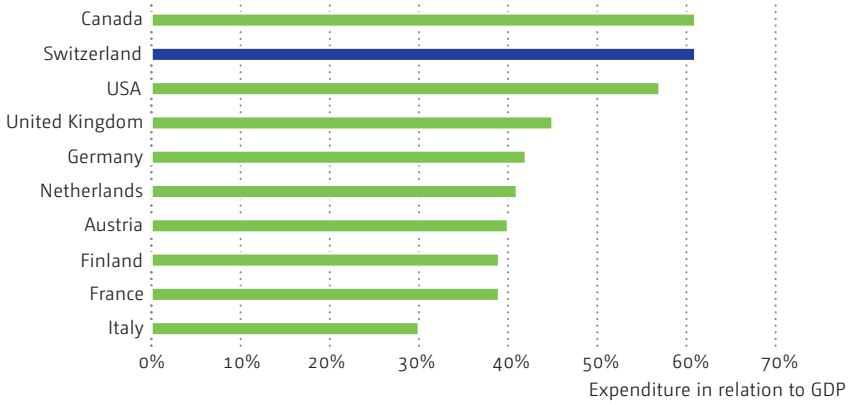
The statements made in this education report mainly refer to the costs of the university sector. They could only be employed as efficiency analyses if we were to assume that all institutions had the same level of effectiveness. This will not be the case, but since no reliable indicators are available on the effectiveness of the universities, the unilateral observation of the input side is the only type of observation possible.

According to Figure 143, Switzerland is the country which has the most students at a top-ranked university (which could be used as an indicator for measuring effectiveness). Even though Switzerland has the highest per-student expenditure expressed in terms of GDP (→ Figure 144), it can be demonstrated that countries with a similar level of expenditure (i.e. Canada and the US) provide considerably fewer places at top-ranked universities for their students (→ Figure 145).

14 See, for example, *Kempkes and Pohl (2006)*, *Kraus (2006)*, *Agasisti and Salerno (2007)* or *Johnes (2006)*.

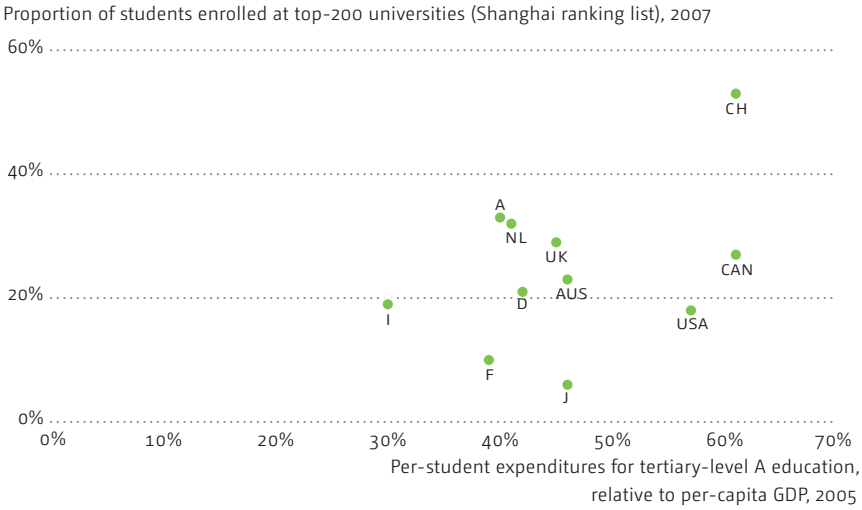
144 **Per-student expenditure for tertiary-level A education in relation to per-capita GDP, 2005**

Data: OECD



145 **Students enrolled at top-ranked universities and annual per-student expenditure, 2005/7**

Data: OECD; evaluation: SCCRE



Considerable differences in cost between universities and fields of study categories

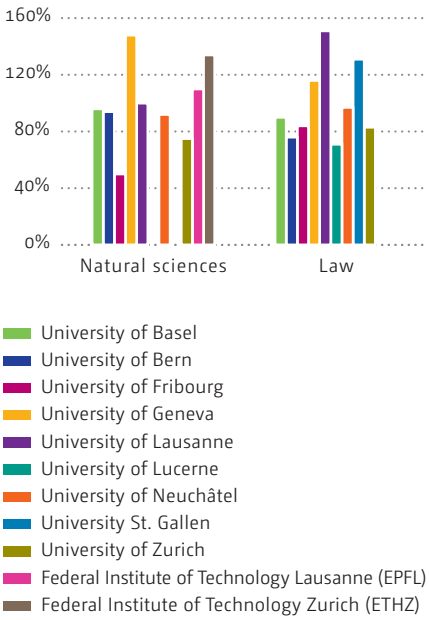
The annual per-student costs of teaching vary between CHF 9,690 (for law) and CHF 39,970 (for agriculture and forestry)[15], with considerable differences between universities for one and the same field of study. Figure 146 provides an example of the differences in cost for the natural sciences (at the high-cost end of the spectrum) and law (at the low-cost end of the spectrum).

These differences in annual cost can be explained by differences in material costs, infrastructure costs and human resources costs. The latter category

15 The costs of teaching in medical studies do not yet form part of the FSO's cost calculation due to problems in measuring them (university hospitals). A pilot study relevant to this question is currently under way.

146 **Cost differences between universities, 2007**

Annual per-student costs, normalised on the basis of average costs for specific disciplines (100%)
Data: FSO



depends on wage levels for academic staff, on the one hand, and, of course, on student-teacher ratios on the other.

Figure 147 shows that fields of study can be broken down into two groups: those with high annual costs and a low number of students per teacher and those with low annual costs and high number of students per teacher. Assuming that student-teacher ratios have no impact on effectiveness (at least up to a certain point), then fields of study such as pharmacology or the exact sciences would be extremely inefficient, and fields of study such as social sciences or law would be extremely efficient. Generally speaking, however, study conditions and the requirements in respect of student-teacher ratios and infrastructure are not comparable in all fields of study, which prevents us from drawing such foreshortened conclusions on the basis of available data. These differences do, however, raise the question of whether all fields of study have the same optimum student-teacher ratio. Seen from the opposite angle, can the same performance be achieved with a lower student-teacher ratio or do insufficient student-teacher ratios have a negative impact on learning?[16] Studies conducted thus far on «class size» at tertiary level have had mixed results. In their study of economics students, *Martins and Walker (2006)* found that the individual characteristics of students played a decisive role in their success rather than the learning environment. *Kokkelenberg, Dillon and Christ (2008)*, by contrast, found that students in larger-sized classes obtained lower scores. In their literature study, *Toth and Montagna (2002)* set out the methodological difficulties associated with measuring the effect of teacher-student ratios at universities, along with the results of eight different studies.

Student-teacher ratios are not the only factor affecting the costs and the impact of studies on student success. The type of teaching staff is also relevant. Using assistants instead of professors to teach students is less cost-intensive. This raises the question of whether this has an impact on the quality of studies. *Carrell and West (2008)* examined this issue by monitoring students distributed randomly across various courses. The results show two different effects: the academic rank and experience of professors negatively influence the performance (marks) of the students in elementary courses, while positive impacts on performance can be seen in the follow-on (more advanced) courses.

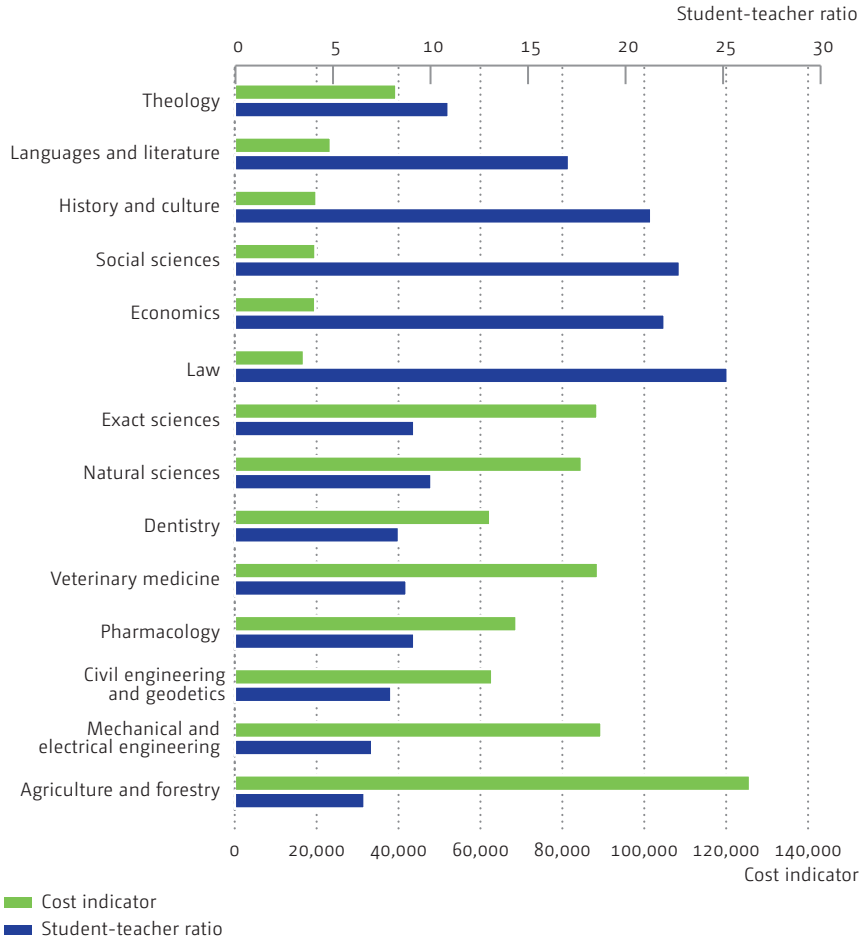
Progression through studies

Expenditure and the cost of studies are not the only factors of relevance for estimating efficiency. Students' progression through their studies is also important: students who change their field of study after a few semesters have not only generated costs while studying the «wrong» subject, they have also delayed graduation: they are wasting time that they could use productively on the job market. If we assume (and not everyone agrees with this assumption) that semesters spent studying a subject other than the one in which a

16 The Swiss Students' Association, for example, is calling for a reallocation of professorships to the humanities and social sciences. The Federal Council Statement on Education, Research and Innovation for 2008–2011 calls the student-teacher ratios in some fields of study «precarious».

147 **Student-teacher ratios and costs, 2007**

Data: FSO



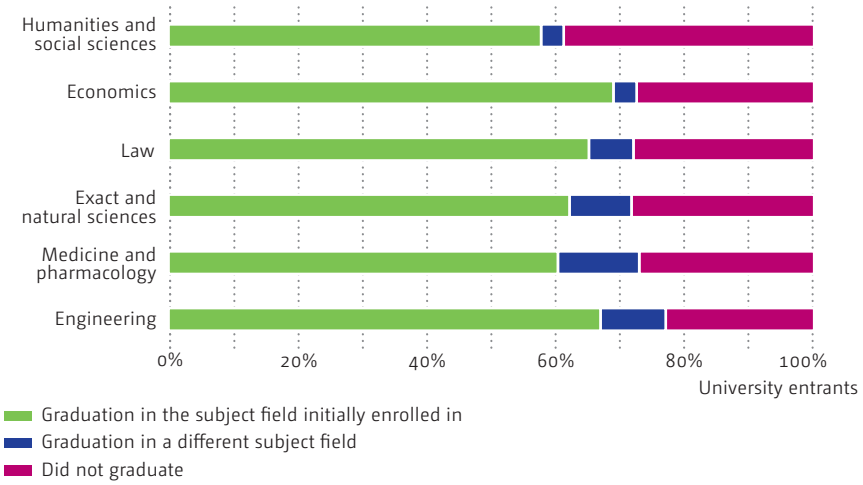
Cost indicator: annual cost of Bachelor's degree programmes and proportion of research costs for Bachelor's degree programme per student

Student-teacher ratio: number of students enrolled in Bachelor's degree programmes divided by the number of teaching staff, in FTE

qualification is gained do not contribute towards a higher productivity, then changing courses of study is highly inefficient.

148 **Graduation rates in the subject field initially enrolled in, 1997 cohort**

Data: FSO



The data available in Switzerland only enable us to determine the proportion of students who began their studies in one field of studies category and graduated in another (→ Figure 148). A single field of studies category (such as humanities and social sciences) is comprised of a large number of different fields of study. We can only assume that changes between fields of study as well as within the same field of studies category occur frequently and that this could constitute an efficiency problem.

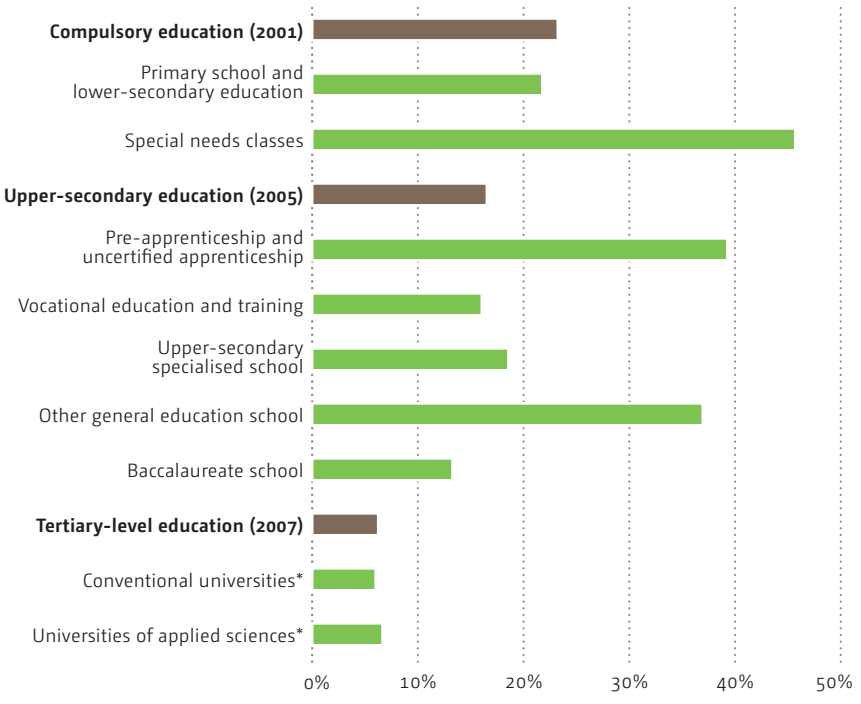
Equity

Equity aspects of university education can be presented in terms of access to university programmes, choice of subject and transitions to PhD programmes or to the job market. While gender distributions in universities are very well documented, practically no studies have been conducted on the students with a migration background enrolled in tertiary-level education.

Students with a migration background

A comparison of the proportion of foreign nationals at each level of the Swiss education system clearly shows that this proportion decreases with each subsequent level (→ Figure 149). The proportion of Swiss-educated foreign nationals at tertiary level does not differ greatly between the conventional

149 **Proportion of foreign nationals, 2001–2007**
Data: FSO



*Swiss-educated foreign nationals

Swiss-educated foreign nationals:
Foreign nationals enrolled at a university who obtained their school-leaving qualification entitling them to university admission (e.g. Baccalaureate) in Switzerland.

Foreign-educated foreign nationals:
Foreign nationals enrolled at a university who obtained their school-leaving qualification entitling them to university admission (e.g. the German Abitur) outside of Switzerland.

universities and the universities of applied sciences (6% at conventional universities and 6.7% at the UAS). All in all, the proportion of foreign students at conventional universities is 24%, but just under three-quarters of these obtained their school-leaving qualifications entitling them to university admission abroad (foreign-educated foreign nationals).

The drop in the number of foreigners between Baccalaureate school (13%) and tertiary level (6% Swiss-educated foreign nationals) is striking. This decrease cannot be explained on the basis of the available data. A study conducted with data taken from the Federal Population Census confirmed that the probability of pursuing higher education generally goes hand in hand with naturalisation at the age of 16–20. These young people can then no longer be isolated in the universities' student statistics. This could explain the significant difference in the observed proportions of foreign nationals attending Baccalaureate schools and tertiary-level A institutions.

The naturalisation hypothesis is supported by a study carried out by *Mey, Rorato & Voll (2005)* in which the frequency of studying at university is estimated as a function of the parents' nationality. The findings show that the likelihood of obtaining a tertiary-level qualification tends to be higher for young people whose parents are foreign nationals than for those with Swiss parents (provided that they have achieved an upper secondary-level qualification).

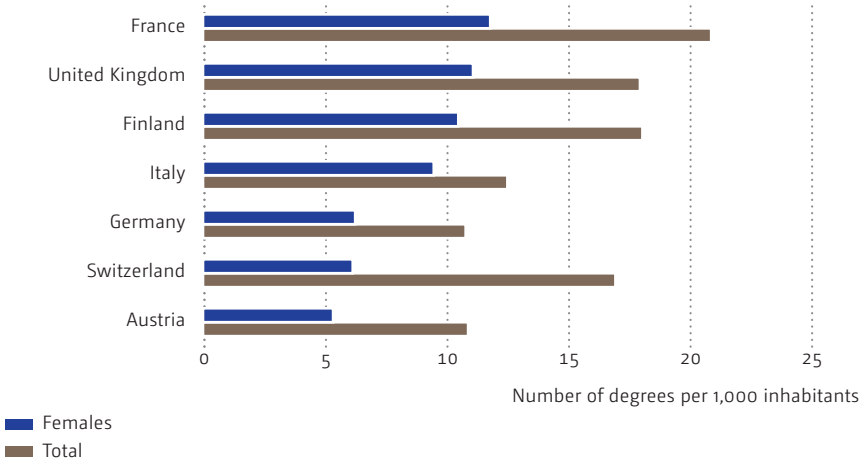
Gender disparities at universities

Considerably more research has been documented on gender differences than on differences between foreign and Swiss students. Gender-specific subject choices remain virtually unchanged. It had been hoped that, precisely in the technical and natural sciences fields, the requirement for graduates could be covered by a higher proportion of female students in these fields. This would not seem to have happened so far, however *(Franzen, Hecken & Kopp, 2004; FSO, 2008m)*. Compared to other countries, Switzerland also has a considerably smaller proportion of female students studying technical and natural sciences subjects (→ Figure 150).

150 **Degrees in mathematics and technology, 2006**

Per 1,000 inhabitants

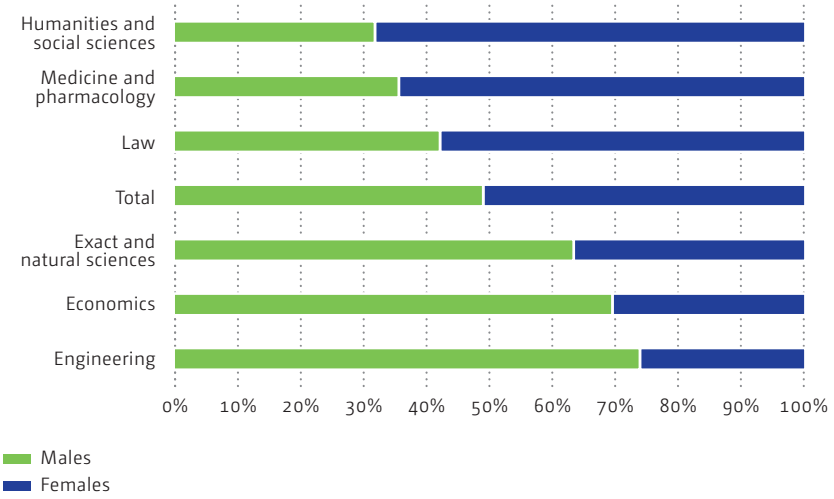
Data: Eurostat



The overall gender distribution across all the various fields of study at university is very well balanced, despite considerable differences in individual fields of study (→ Figure 151). Likewise, there does not seem to be much of a difference between males and females for the Bachelor-to-Master transition, despite major differences from one field of studies to another. The pronounced gender segregation raises the question of what mechanisms lead to such a gender bias in the choice of field of studies. It can only be said with certainty that the choice of field of studies has a major impact on job market prospects later on (→ *Chapter Tertiary-level education, page 171*).

151 **Degrees awarded by gender, 2007**

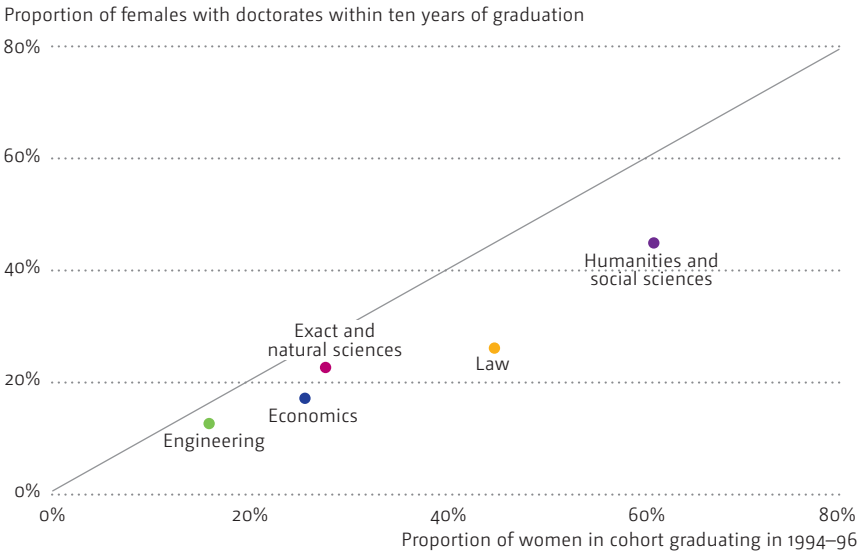
Data: FSO



152 **Proportion of female students graduating and taking doctorates**

Average number of graduations (Diplom, Licentiate) 1994–1996. Since a doctorate in medicine has a different value and would distort statistics, these doctoral programmes were excluded from the calculations.

Data: FSO/SHIS; calculations: BASS



The fact that roughly the same number of women and men are studying at the universities must not be allowed to obscure the fact that there may nonetheless be substantial problems in respect of equal opportunities when it comes to the choice of subject to study.

Gender disparities in doctoral programmes

Gender disparities also become visible when the focus is placed on academic careers. With female students accounting for 36.9% of all PhD students, Switzerland has one of the lowest percentages in Europe *(FSO, 2008m)*. Clear disparities can also be seen in field of study categories both in absolute terms, i.e. in the number of students taking a PhD, and in terms of gender distribution. There are fewer women than men taking a doctorate in all fields of study. While the proportion of female students decreases in the transition from upper-secondary level to university, even more women are «lost» from the education process with the transition to PhD programmes (→ Figure 152). In fields of study with a relatively small proportion of students taking doctorates, but a large proportion of female students, we find that the proportion of female PhD students is considerably lower; this is particularly evident in humanities and social sciences. The proportion of male students taking a PhD in this field of studies category is twice as high as the proportion of female students. In most fields of study, the corresponding proportions are tending to even out. However, this is mainly due to the fact that men are less likely to take doctorates *(Dubach, 2008)*. Although gender disparities can be found in the transition from Master's degree programmes to PhD programmes, success rates between male and female students are fairly similar: 80% of male students and 75% of female students enrolling in at least one semester of PhD studies obtain their doctorate within ten years.

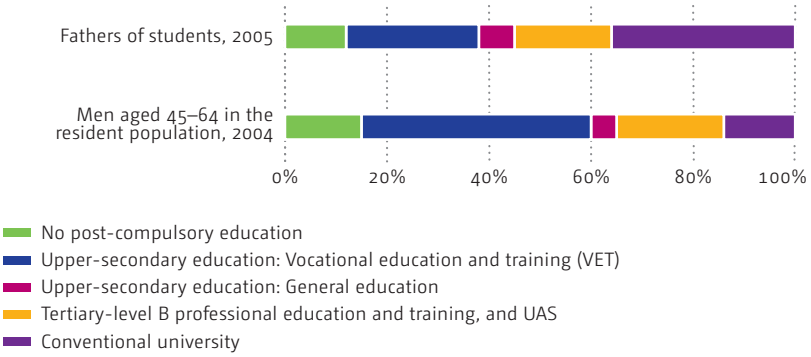
Social background

The likelihood that a student will complete university studies depends heavily on the educational background of the student's parents (→ Figure 153). If the education level of the parents did not have any influence on a student's enrolment in university studies, then the distribution by education level between students' parents and individuals in the 45–64 age group would not differ much. However, this is not the case: while only 14% of males in the 45–64 age group have a university degree, we find that a considerably higher percentage (36%) of the fathers of university students hold such a qualification. Young people whose fathers hold a university degree are 2.6 times more likely to enrol in university studies than would normally be expected. Conversely, students whose fathers hold vocational education and training (VET) qualifications at upper secondary level have particularly few prospects of enrolling in university studies – even fewer than for those with parents who have no post-compulsory qualifications.

A chronological comparison also shows that there has scarcely been any change in respect of education opportunities as a function of social background over the past ten years *(FSO, 2007a)*

153 **Access to universities and educational background, 2004/5**

Data: FSO



Universities of applied sciences (UAS)

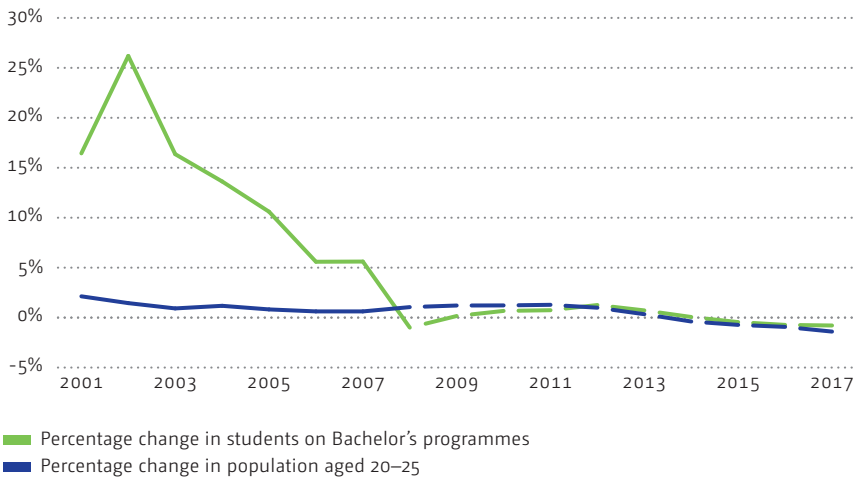
Context

Fourteen years after the Universities of Applied Sciences Act came into effect, 57,250 students now study at Switzerland's seven public UAS and the private Kalaidos UAS.[1] The UAS student body has grown steadily over the past decade (→ Figure 154).[2] Student numbers started to level out in 2006, and the Federal Statistical Office (FSO) estimates that there will not be much of a difference in student numbers between 2010 and 2017. The number of students enrolled in Bachelor's degree programmes and the old-style *Diplom* degree programmes will follow demographic trends during this period.

154 **UAS students and demographic change**

Data: FSO

Change compared with previous year



UAS student numbers will nevertheless increase, because UAS Master's degree programmes were introduced in 2008 which are not included in the forecasts in Figure 154. The first implementation phase of the Bologna Reform process was completed back in 2005 when the first UAS replaced their previous *Diplom* degree programmes with Bachelor's degree programmes. The second implementation phase of the Bologna Reform process began in December 2007, when the Federal Department of Economic Affairs (FDEA) approved 81 UAS Master's degree programmes. These Master's degree programmes serve as a complement to UAS Bachelor's degree programmes by providing students with more in-depth and specialised expertise in relation to specific professions. Contrary to the case at the conventional universities, Bachelor's degrees (allowing entry into the job market) are to remain the standard graduation qualification at the UAS.

1 2008/9 academic year, excluding students enrolled in continuing education and training (CET) programmes. The private Roches-Gruyère UAS launched a Bachelor's degree programme in international hospitality management in 2009 and is not yet included in the reported figures.

2 The sharp increase after the year 2000 is due to the inclusion of health care, social work and art.

Sixty-seven new UAS Master's degree programmes were introduced in autumn 2008, drawing 2,082 enrolments (teacher training excluded, → Figure 155). Whether the number of students enrolled in these UAS Master's degree programmes will increase is still unknown. The FSO has established two possible scenarios, the first based on an average UAS Bachelor-to-Master transfer rate of 28% and the other based on an average transfer rate of 37%.[3] UAS Master's degree programmes are therefore expected to draw between 8,000 and 12,000 students, with UAS Bachelor-to-Master transition patterns varying sharply between fields of study. According to the FSO's Swiss Graduate Survey 2005, around 15% of the holders of a UAS Bachelor's degree intended to obtain an additional qualification (→ Figure 156). If the new UAS Master's degree programmes are unable to draw a new target group of students wishing to continue their studies, it is unlikely that the FSO's anticipated UAS Bachelor-to-Master transition rates will be reached.

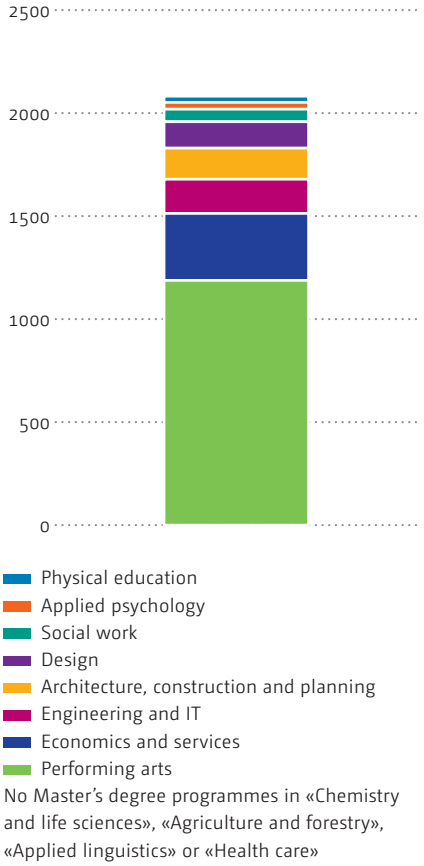
In other countries with UAS (i.e. Germany, Austria, Finland, the Netherlands), two-tiered study programmes have now been introduced, in most cases even more rapidly than in the conventional universities *(Autorengruppe Bildungsberichterstattung, 2008; Statistics Austria, 2008)*. Unfortunately, there is virtually no detailed information enabling us to determine the proportion of UAS Bachelor's degree holders who choose to enrol in a UAS Master's degree programme.

UAS size

The consolidation process at the end of the 1990s led to a regrouping of smaller specialised tertiary-level B institutions into seven public UAS. The consolidation process explains why Swiss UAS tend to be larger than corresponding

155 **UAS students enrolled in Master's degree programmes, 2008**

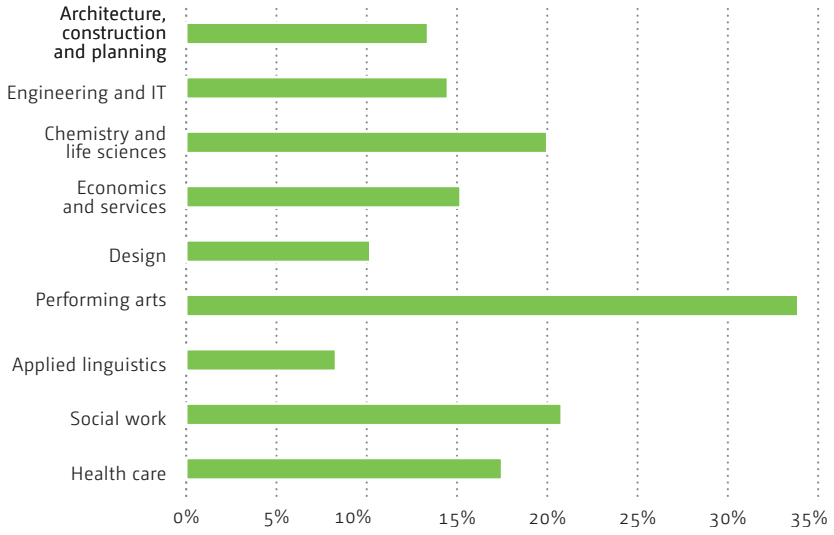
Data: FSO



No Master's degree programmes in «Chemistry and life sciences», «Agriculture and forestry», «Applied linguistics» or «Health care»

156 **Proportion of UAS graduates planning or already pursuing further qualifications, 2005**

Data: FSO, Analysis: SCCRE

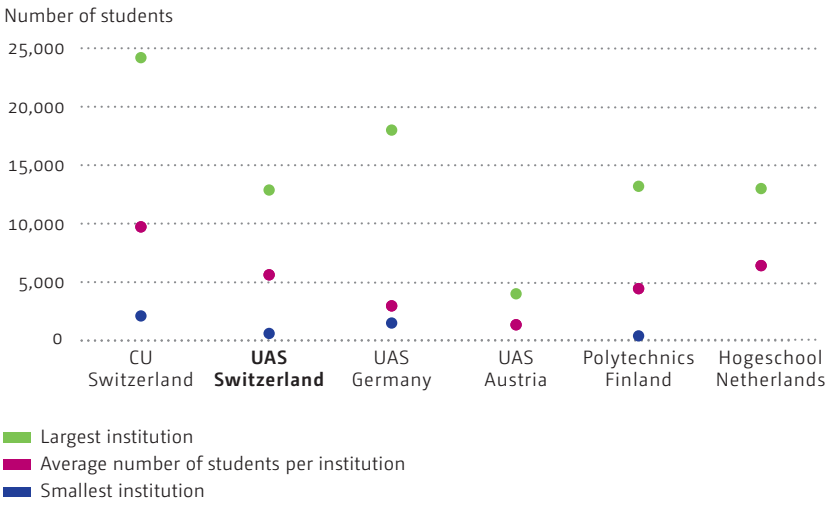


Further qualification: Master's degree or doctoral programme at a conventional university, doctorate, postgraduate studies at a conventional university or UAS

3 This corresponds to the transition rate found in Germany.

157 **International comparison of the size of conventional universities and UAS, 2008**

Data: researched by SCCRE. Only publicly-run universities

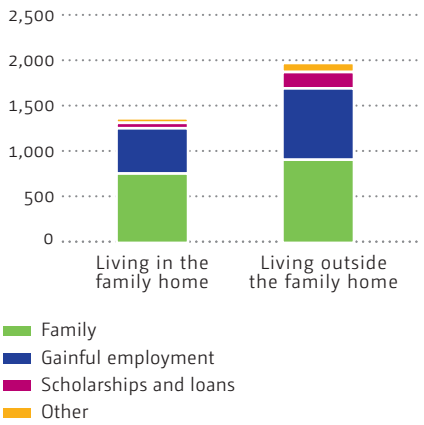


UAS in other countries (→ Figure 157) but still considerably smaller than the conventional universities. It must also be borne in mind that Switzerland's seven public UAS are still comprised of smaller, geographically dispersed units that normally handle their own administrative affairs. UAS size therefore does not seem to have any major impact on the cost of study programmes (→ *Efficiency/Costs, page 216*). This can be due to the fact that the costs are not stated for the individual units but only for the seven regional UAS.

Employment and income

158 **Monthly income of UAS students, 2005**

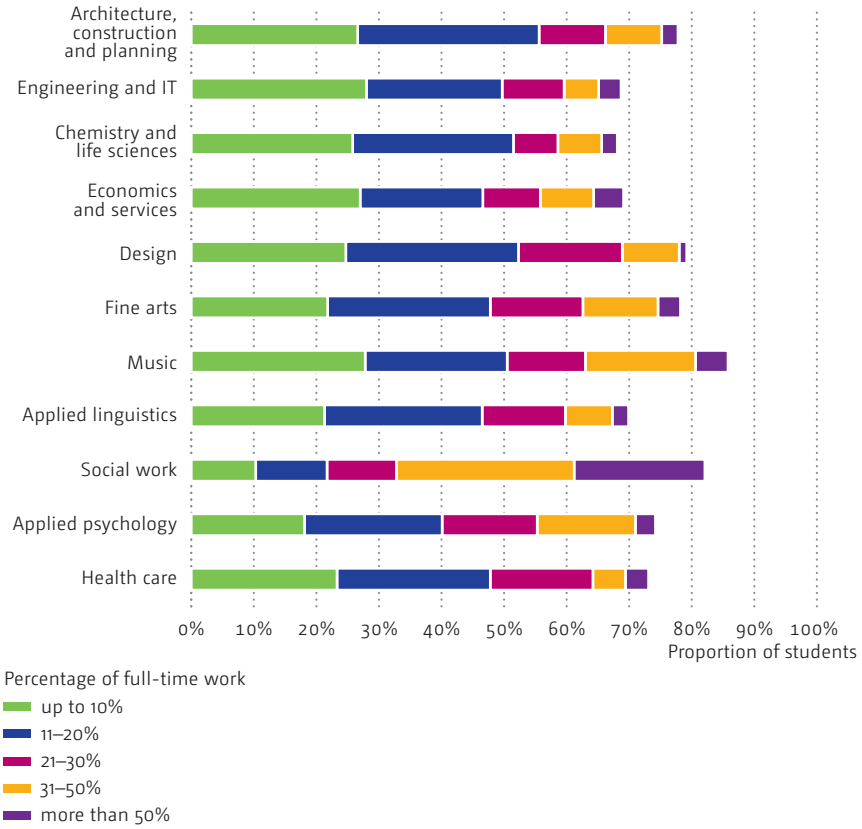
Data: FSO



The Bologna Reform process introduced the concept of modularisation to UAS degree programmes, which meant that the concept of prescribed times within which students were supposed to complete their course, and also part-time study while in work, was discontinued. The result is considerable flexibility in terms of both study intensity and pace. However, it is currently not possible to determine whether this has had an influence on students' study and employment patterns, since the last survey to gather this information was conducted in 2005. What can be said is that most UAS students work alongside their studies, but 60% only work for a small number of hours a week (→ Figure 159). Over half of their monthly expenditures are covered by allowances from their parents (→ Figure 158). The monthly income of UAS students does not differ substantially from that of students at conventional universities on average. This is probably due to the fact that the UAS student body is highly heterogeneous. Full-time students tend to be those enrolled in health care, social care and art programmes (normally holders of a Baccalaureate). Part-time students tend to be those enrolled in engineering, economics and services. In most cases, these students have already been trained for a specific occupation and have a considerably higher income from their gainful employment. Fundamentally, however, it can be said that, in the same way as at the conventional universities, studying at a UAS is, on average, only possible with the financial support of parents (or alternatively student grants or loans) (→ *Equity, page 219*).

159 **Gainful employment rates of UAS students, 2005**

Data: FSO

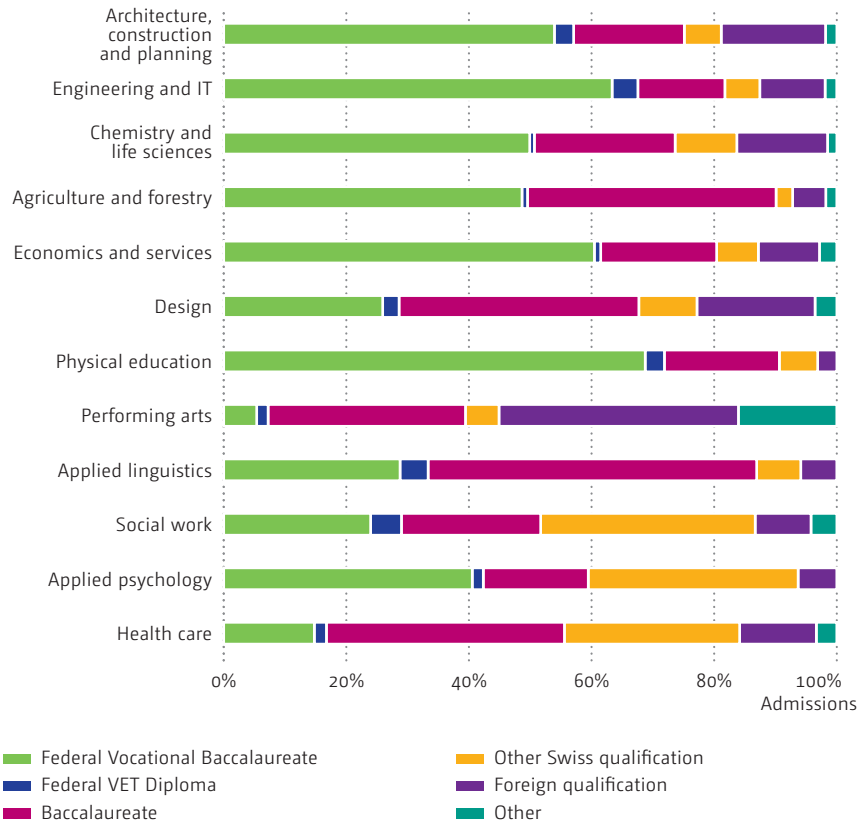


Institutions

The Bologna Reform process has had very little impact on the composition of newly enrolled UAS students. UAS continue to recruit their students from very heterogeneous backgrounds, including a large proportion of students with a Baccalaureate or an upper-secondary specialized school certificate. Although the main path to UAS is vocational education and training (VET) in combination with the Federal Vocational Baccalaureate, holders of a Baccalaureate are also able to enrol in a UAS Bachelor's degree programme upon completion of a traineeship. Figure 160 shows that, in UAS that have evolved out of former tertiary-level B engineering colleges and tertiary-level B business administration colleges, the Federal Vocational Baccalaureate is the predominant form of entry qualification, while in the fields of social care or the fine arts, there are fewer than 30% of students with a Federal Vocational Baccalaureate. This is despite the fact that new specific Federal Vocational Baccalaureates were also introduced for health and social care by way of entry qualifications. In addition, there are practically no upper-secondary level preparatory apprenticeships for applied linguistics, music or arts, which is one of the main reasons why most students enrolled in these UAS Bachelor's degree programmes come from the upper-secondary general education sector rather than from the VET sector. The opposite holds true for students enrolled in UAS Bachelor's degree programmes in economics and engineering.

160 **UAS admission by type of school-leaving qualification, 2007**

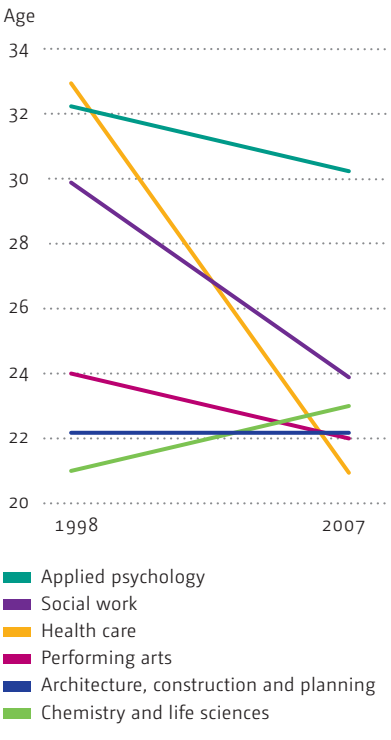
Data: FSO



161 **Age of students upon admission (median)**

Data: FSO

Practically no change in the age of UAS students upon admission for «Engineering and IT», «Agriculture and forestry» «Economics and services» and «Design».



Students enrolled in UAS Bachelor's degree programmes not only differ substantially in terms of their entry qualification but also in terms of the age at which they begin their studies. Newly enrolled students in UAS Bachelor's degree programmes in applied psychology and social work tend to be considerably older than their fellow students in other fields of study. After the introduction of the Federal Vocational Baccalaureate and UAS Bachelor's degree, it was thought that students would begin their UAS studies at an earlier age. Instead, there was only a slight change in enrolment age in most UAS fields of study (median of around 1 year) (→ Figure 161). The only exceptions were health care and social work, where enrolment ages fell substantially. However, this development was not necessarily the result of the restructuring of education and training programmes.

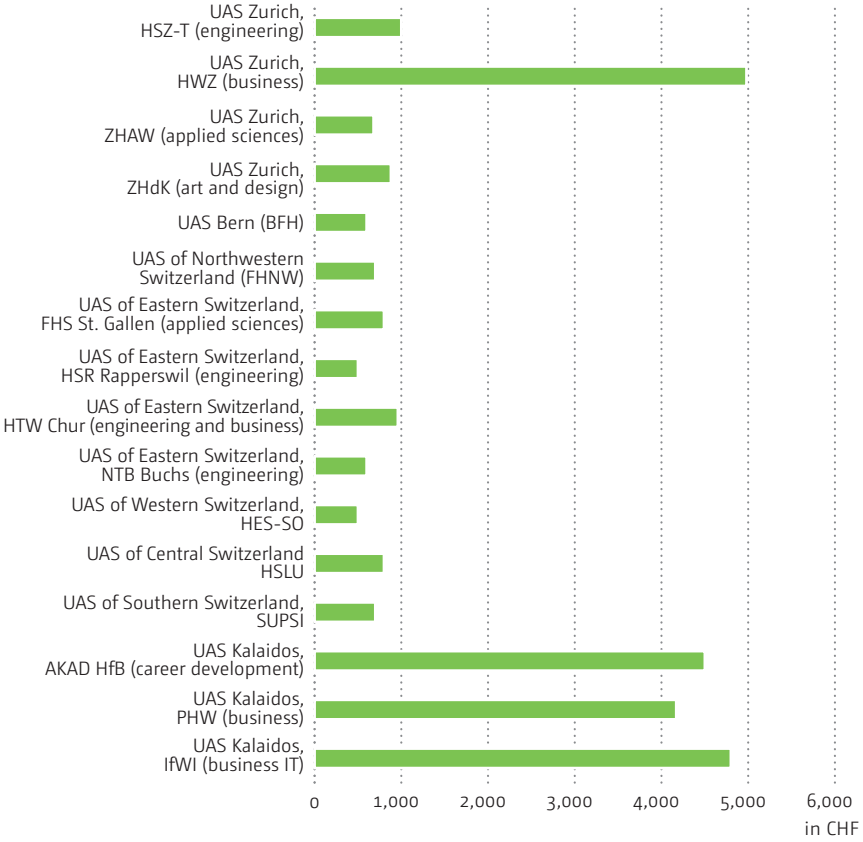
Funding

As at the conventional universities, UAS students also have to pay part of the cost of their study programmes in the form of tuition fees. Publicly-run UAS charge between CHF 1,000 and CHF 2,000 per year (→ Figure 162). Private UAS may charge anywhere from CHF 4,000 to over CHF 9,000.[4] As with

4 Tuition fees for the Bachelor in Business Administration at the private Kalaidos UAS business college: CHF 9,600 per year.

162 **UAS tuition fees per semester, 2009**

Data: researched by SCCRE

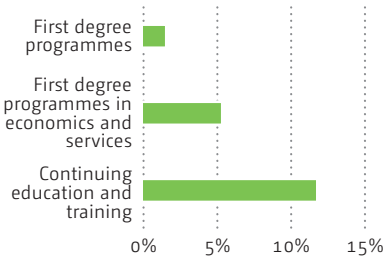


university tuition fees, public UAS tuition fees cover only a small portion of the actual costs of a study programme. Since tuition fees within a given UAS do not generally vary from one field of study to another, the student contribution to the costs of their study programme varies considerably: students on a UAS Bachelor's degree programme in economics (at UAS Bern, for instance) will pay 8% of the costs of their studies from their own pockets, while design students will only pay about 3%. If tuition fees were adjusted to take into account the full cost of study programmes in each subject, then the burden on students in some subjects would be so heavy that this would either lead to changes in demand for the individual subjects or cross-subsidising would have to be introduced (→ *Chapter Universities, page 185*).

The Federal Council may grant licences to private providers to set up and manage a UAS, provided that the legal requirements are met. The private Kalaidos UAS received such a licence in 2005 and the Les Roches-Gruyère UAS received its licence in 2008. At present, private UAS hold a relatively small share of the market (only Kalaidos) and issue fewer than 2% of all UAS degrees, most of which are awarded in the fields of economics and services (→ Figure 163). Kalaidos is a major issuer of continuing education and training (CET) qualifications, however. This could be due to the cost of the study courses: while a Bachelor's degree at UAS Kalaidos is considerably more expensive than at the other UAS, there is virtually no difference in the tuition fees for CET qualifications at the private and public UAS.

163 **Proportion of private UAS degrees compared to total number of UAS degrees, 2008**

Data: FSO



Effectiveness

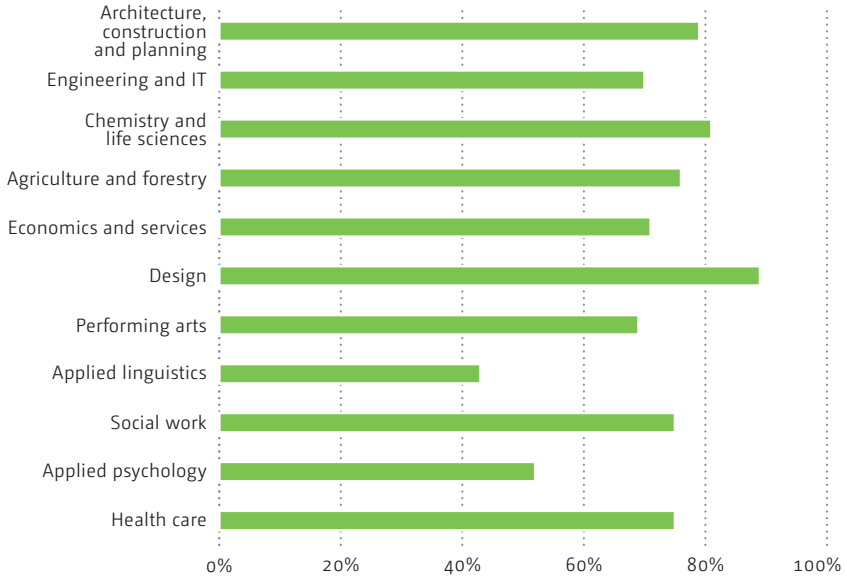
Due to the nature of their remit, it is not possible to measure the effectiveness of UAS solely on the basis of a few indicators. Instead, the various objectives need to be taken into account. As far as CET programmes and services are concerned, there are very little externally available data or estimates that would enable an in-depth analysis of UAS performance. For this reason, and since this report covers the education system, what is set out below refers solely to UAS teaching.

Graduation rates

As with students at conventional universities, it is also possible to calculate how many UAS students completed their studies within a maximum of five years (→ Figure 164). This indicator is, however, subject to the same limitations as those mentioned in the chapter on conventional universities: in interpreting the data, it is important to remember that students are self-selected in specific fields of study and at specific universities. It is also unclear whether students interrupt or prolong their studies because of stringent quality standards or due to insufficient student-teacher ratios at the institution in question. Unlike at the conventional universities, entrance examinations are held for some UAS Bachelor's degree programmes (e.g. health care, social care, art). Graduation rates among students who have taken an entrance examination are generally higher *(FSO, 2005b)*. This seems to indicate that such entrance examinations are relatively well-suited to ascertaining the study disposition of potential students. Seen in this light, dropout rates in UAS degree programmes that do not require an entrance examination could actually be a manifestation of quality control by the UAS, in not permitting unsuitable students to reach graduation.

164 **Proportion of students graduating within five years of admission in their original subject, 2002 cohort**

Data: FSO



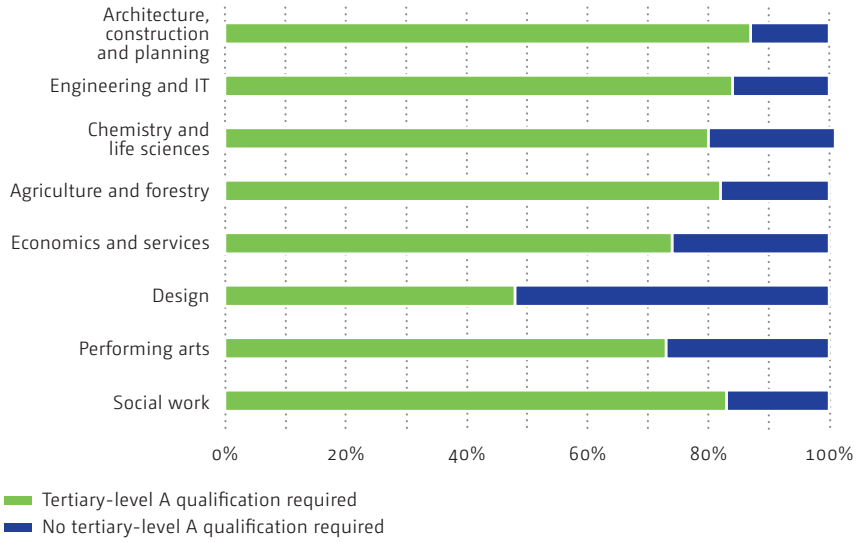
Graduation rates have changed little over the past few years. The strong growth of the UAS and increased enrolment on the basis of a Federal Vocational Baccalaureate seem to have had no impact on the likelihood of a UAS student completing their studies. The considerable differences between fields of study are more striking here. The reasons for these, however, can only be speculated on, since – apart from the entrance tests referred to above, which could constitute one reason – no empirical research has been conducted on this.

Skills

UAS degree programmes are intended to be practically-oriented, enabling qualified professionals to pursue studies at university level. Mandatory traineeships and modularised degree programmes allow students to complement their theoretical knowledge with practical experience so that they will have a blend of skills that matches the needs of the job market *(Forrer & Wilhelm, 2006)*. The FSO study on «Key competencies of Swiss university graduates» *(FSO, 2008k)* draws the conclusion that, in terms of general skills, UAS graduates are somewhat better equipped to handle the requirements of the job market than conventional-university graduates. However, it is reasonable to assume that the higher degree of compatibility between UAS programmes and employment will only be evident in the first years of employment. As graduates gain greater experience on the job market, their skills will align themselves more closely with the needs of employers. An indication of this is the higher wages of UAS graduates compared with conventional-university graduates in the first years of work, a gap which gradually disappears over time *(→ Chapter Tertiary-level education, page 171)*.

165 **Employment qualification requirements for UAS graduates five years after graduation, 2007**

Data: FSO



In the same way as graduates of conventional universities, UAS graduates have jobs commensurate with their education for the most part (→ Figure 165). Nevertheless, five years after graduation, more UAS students (than conventional-university students) end up working in a job for which no tertiary-level A qualification is required. While this is particularly the case with UAS graduates holding degrees in design and art, UAS graduates holding degrees in economics and services may also find themselves in the same position. No studies have so far been conducted with this data to determine how far they have had to accept lower wages as a result *(FSO, 2008k)*.

Efficiency/Costs

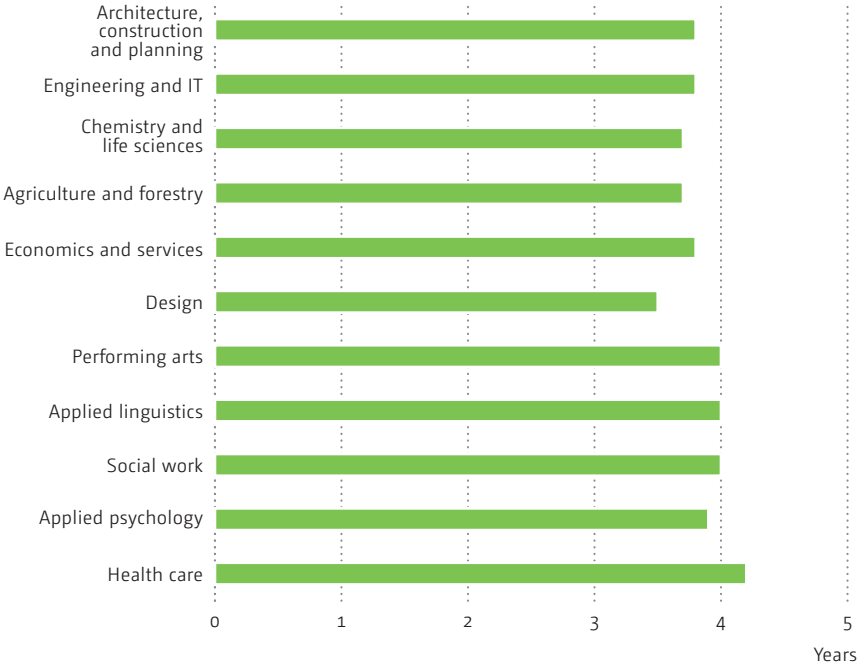
Looking into the question of efficiency at the UAS, we encounter the same problem as for conventional universities with their multiple inputs and outputs. As described in the section covering effectiveness, we saw that UAS have to offer a very wide range of services, and it is not generally possible to match the deployment of funds to individual objectives. No causal link can be established between outputs or outcomes, on the one hand, and inputs on the other. Moreover, there is generally no suitable measure for the quality of outputs.

Despite the modularisation of studies introduced by the Bologna Reform process, the duration of studies from enrolment to the first qualification (i.e. the old-style *Diplom* degree or the Bachelor's degree) has changed very little for many years. The expectation that modularisation would result in a longer duration of studies has not matched observations thus far.

166 **Average duration of studies, 2007**

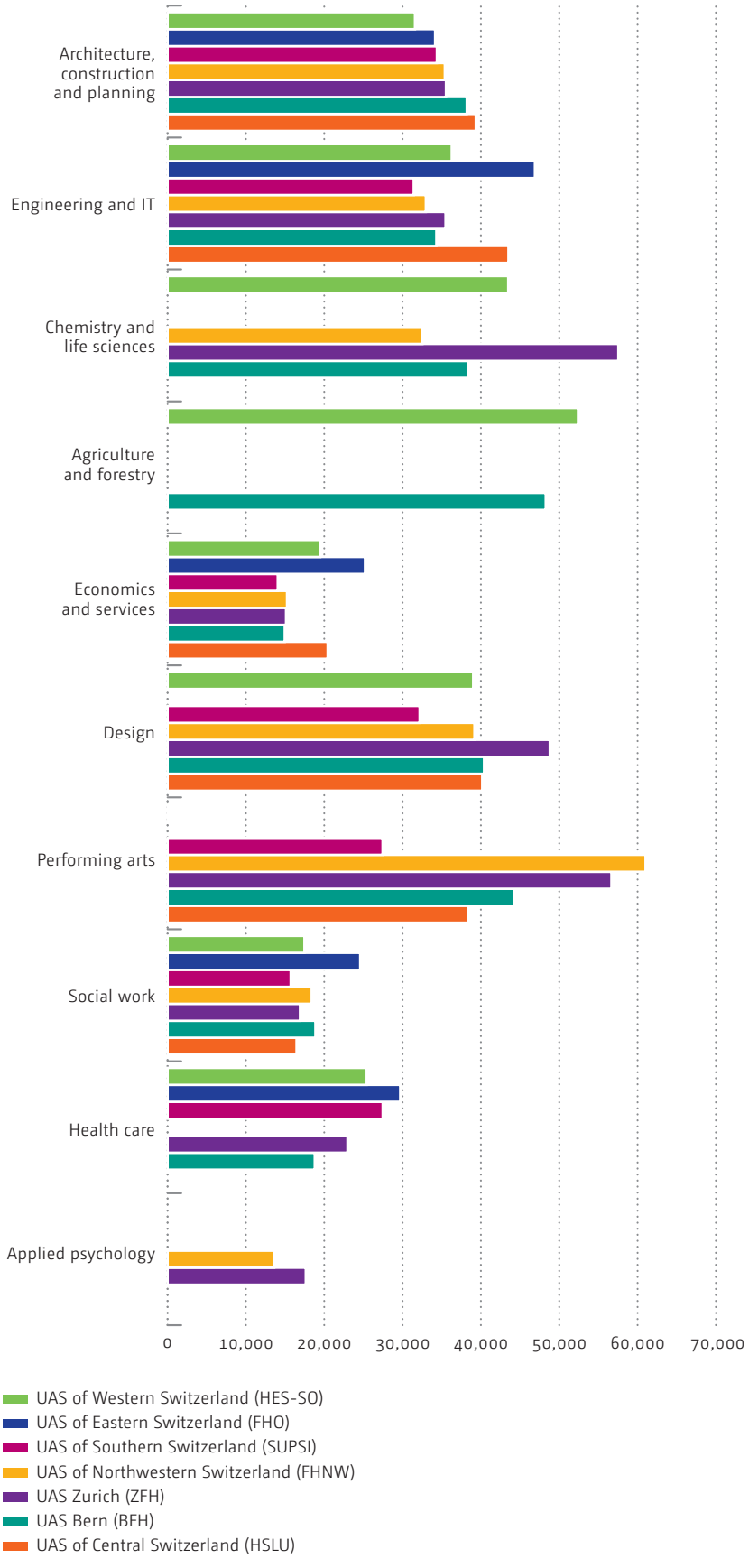
Data: FSO

When calculating study duration, it is not possible to draw a distinction between full-time and part-time students.



167 **Annual teaching costs per student, 2007**

Data: FSO; analysis: SCCRE



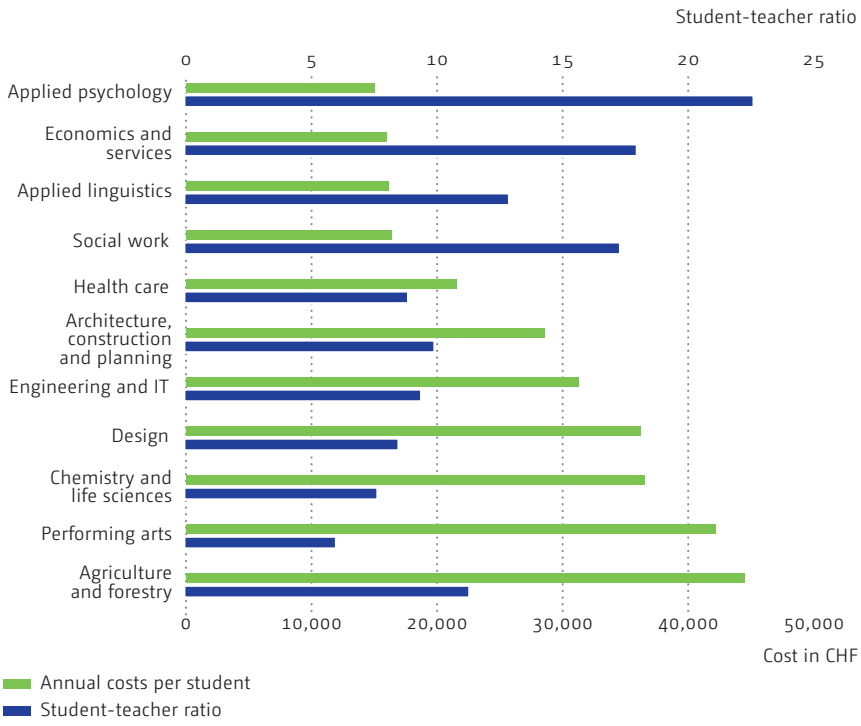
UAS students generally finish their studies around two years before conventional-university students. Since the starting salaries of UAS and university graduates are practically the same, the shorter duration of UAS studies may therefore be viewed as an indication that UAS studies are more efficient (→ Figure 166).

The costs of studies per student and year not only vary greatly from one field of study to another but also from one UAS to another (→ Figure 167). The cost of studies depends on input prices (particularly salaries), material costs and, finally, student-teacher ratios. If we compare fields of study, we find a significant negative correlation between the student-teacher ratio and the cost per student, as is to be expected (→ Figure 168). We do not yet know the factors leading to differences in annual costs among UAS (in the same field of study). A few fundamental considerations are therefore needed. It is clear that the proportion of part-time studies can play a role in lowering costs to a certain extent. As a case in point, the *Scuola universitaria professionale della Svizzera italiana* (SUPSI) has lower costs in all fields of study mainly because there is a disproportionately high number of part-time students.[5] The assumption that economies of scale or input prices may be responsible for cost differences does not match observations: UAS with large student bodies do not have lower costs, nor are degree programmes in high-wage regions such as Zurich more costly.

Student-teacher ratio: The number of students enrolled in first degree programmes compared to the number of teaching staff, in full-time equivalents (FTEs). Teaching staff include professors, other lecturers and also researchers and assistants.

168 **Average teaching costs per student and student-teacher ratio, 2007**

Data: FSO; analysis: SCCRE



5 Other factors explaining the low cost of studies at SUPSI: greater involvement of assistants in classroom settings (cooperation agreement with the Università della Svizzera italiana on doctoral programmes) and integration of the UAS Brig which teaches its students via distance learning programmes at a lower cost.

While UAS and universities have similar student-teacher ratios, the structure of the student-teacher ratios differs substantially. UAS students are mainly taught by professors. Apart from engineering, architecture and economics, there are few assistants who can help UAS professors teach classes or conduct research. In most fields of study, the ratio of professors to assistants is less than one-to-one, while at the conventional universities there are between 2 and 15 assistants for each professor. This is an indication of the different teaching approaches used by these two types of university. At the UAS, classes are often given in the form of seminars involving relatively small groups and one teacher while, at conventional universities, classes for many fields of study are often given in a «chalk and talk» manner in large auditoriums. That having been said, student-teacher ratios do not necessarily reflect the actual intensity of student-teacher interaction: both conventional universities and UAS have staff members, particularly professors, who are solely responsible for conducting research and not for giving classes.

Equity

Equity at UAS may be assessed for various groups of people on the basis of access to studies, acquisition of knowledge and skills during their time at the UAS and transitions to the job market.

Access to UAS by nationality

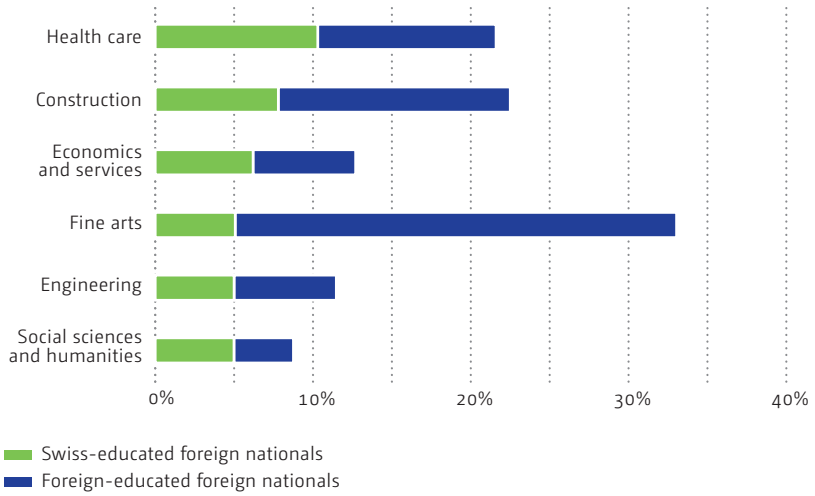
Although the proportion of foreign nationals studying at conventional universities is higher than at the UAS, the proportion of Swiss-educated foreign nationals is slightly higher at the UAS than at the conventional universities (6.7% vs. 6%). If we consider foreign nationals who obtained their

Swiss-educated foreign nationals: Foreign nationals enrolled at a university who obtained their school-leaving qualification entitling them to university admission (e.g. Baccalaureate) in Switzerland.

Foreign-educated foreign nationals: Foreign nationals enrolled at a university who obtained their school-leaving qualification entitling them to university admission (e.g. the German Abitur) outside of Switzerland.

169 **Proportion of graduates with a migration background, 2007**

Data: FSO



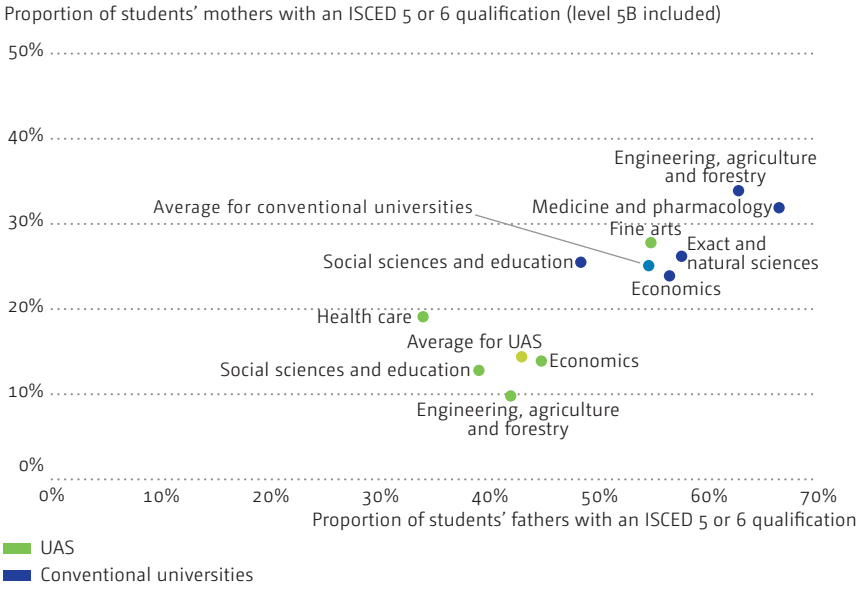
school-leaving qualifications entitling them to university admission outside of Switzerland (foreign-educated foreign nationals), we find considerable differences between the fields of study at conventional universities and the UAS. Only at the UAS do we find major differences in the proportion of Swiss-educated foreign nationals from one field of study to another (→ Figure 169). In their survey of conventional-university and UAS graduates, *Hänsli, Dürsteler and Schmid (2007)* concluded that foreign nationals whose parents lacked tertiary-level qualifications were more likely to gain admission to a UAS Bachelor's degree programme than Swiss nationals from a non-academic home.

Socio-economic background of students

In 2005, the FSO conducted a survey to determine the social origin of students enrolled in universities (→ Figure 170; *FSO, 2007d*). If we compare Switzerland to other countries, we find that, in all the countries surveyed, the fathers of students are more likely to have a tertiary-level qualification than the average male in the same age bracket in the overall population *(FSO, 2008e)*. The differences are rather low in the case of Switzerland, however *(→ Chapter Tertiary-level education, page 171)*. Twenty-three percent of all UAS students come from families where at least one parent has a tertiary-level qualification of type 5A or 6. Among conventional-university students, the proportion is nearly twice as high *(FSO, 2008e)*. The differences are quite clear in fields of study that are offered by both conventional universities and UAS. In this respect, UAS make a greater contribution to social mobility than the conventional universities, since they tend to allow more young people from less educated families to obtain tertiary-level qualifications.

170 **Socio-economic background of students, 2005**

Data: FSO



ISCED 5: This is the first stage of tertiary-level education. It lasts at least two years and requires students to have valid upper-secondary level qualifications in order to gain admission. Level 5B takes in practically-oriented courses at VET colleges and similar institutions. Level 5A (university level) takes in all university education at below doctorate level, while ISCED 6 covers qualifications obtained through research, i.e. doctoral and postdoctoral qualifications, plus post-graduate education.

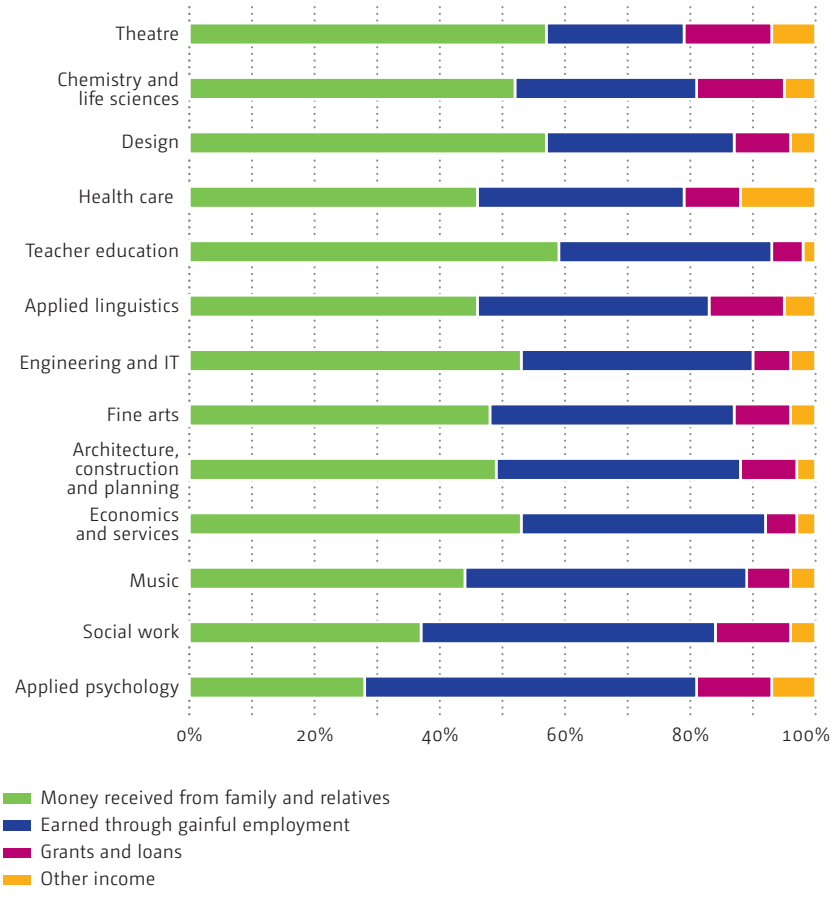
Paying for UAS studies

Students' social background determines both the amount of financial support they receive as well as the structure of their income for financing their studies. The proportion of support received from families is lower for students from the lower social strata, and the proportion of recipients of financial aid is higher among UAS students than among university students. This applies particularly to fields of study with a disproportionately high percentage of students from lower social strata *(FSO, 2008e)*.

The possibility of pursuing gainful employment during one's studies differs according to the field and type of studies (→ Figure 171) but does not depend essentially on social background when viewed over the entire tertiary level (i.e. taking conventional universities and UAS together) *(FSO, 2008e)*. Nevertheless, UAS students rate their financial situation as less good than conventional-university students. Significant reductions in student grants or increases in tuition fees would therefore worsen the situation for socially disadvantaged students especially at the UAS.

171 **Source of student income, 2005**

Data: FSO



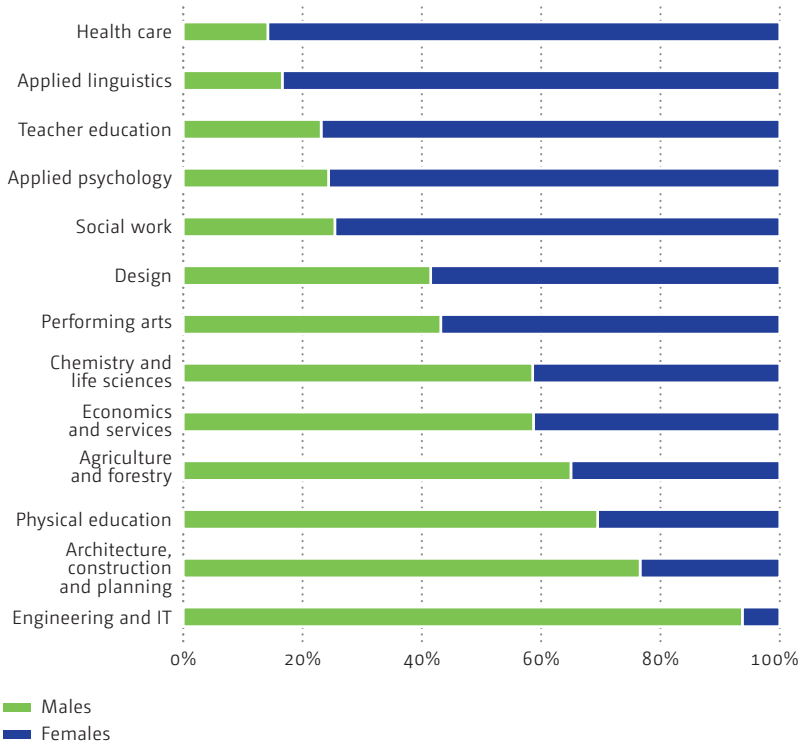
Proportion of female students at UAS

Equality of opportunities in relation to gender has been much more extensively documented for the education system, and especially for the tertiary level, than have the disadvantages suffered as a result of social or cultural origin. The proportion of female students has increased in nearly all UAS fields of study since 2004. As at the conventional universities, the gender ratios still differ clearly according to the individual fields of study (→ Figure 172).

Underrepresentation of women at UAS can be found particularly among highly qualified staff members even if the share of female professors, at 31%, is considerably higher than at the conventional universities (14.6%; in 1998 only 7.2%). Moreover, the differences between the shares of women professors, women assistants, women researchers and women lecturers are smaller within UAS than within conventional universities.

172 **Gender distribution of UAS students, 2008**

Data: FSO



Universities of teacher education (UTE)

Context

For purposes of education statistics, the universities of teacher education with their current 12,000 or so students (roughly 7% of all students at tertiary level) count as universities of applied sciences. However, on both institutional and content grounds, and given their importance for the education system, it is justifiable to consider this youngest sector of the university landscape as a university type in its own right.

Considering the central role that teachers play in the quality of education, it is easy to see that the appropriate education of teaching staff is a decisive prerequisite for a successful education system *(Ditton, 2000; Terhart, 2001; Wössmann, 2002; Wayne & Youngs, 2003; OECD, 2005; Lipowsky, 2006; Hanushek, 2005, 2008)*. The Swiss-wide transfer of teacher education from former upper-secondary level teacher training colleges to universities of teacher education occurred as recognition of this fact. With the creation of universities of teacher education, teacher education was to become more professional and be based on research findings *(EDK, 1993, 1995a)*.

The strategic planning of teacher education is important not only from a qualitative but also from a quantitative point of view. As practically the only employer of teachers on the job market, the state, which is also virtually the only supplier of teacher education, has an interest in managing teacher education in both quantitative and qualitative terms. Strategic planning, however, must take a series of contextual factors into account, such as demographic change and economic cycles.

Ensuring an adequate number of teachers

One important objective of monitoring teacher education is to ensure that there are an adequate number of teachers (see *Lehmann, Criblez, Guldimann et al., 2007*). Only a small amount of reliable data are, however, available for steering the supply side in this way. Due to the decentralised structure of education institutions, there are no nationwide Swiss data on the job market situation.[1] The sheer size of the teaching body means that even minor changes on the supply or demand side can have a major impact on the balance of the job market, thereby affecting schools and their education mandate *(OECD, 2005)*.

Demographics

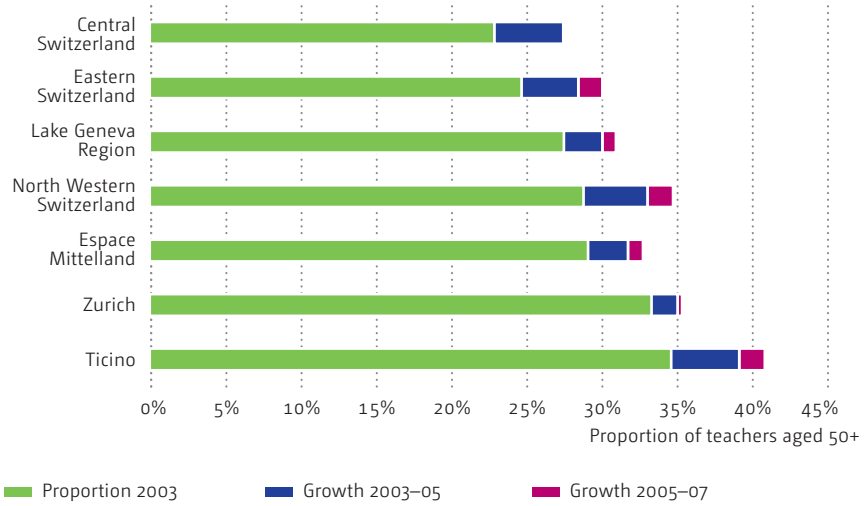
In addition to institutional factors, the demand for teachers is mainly influenced by demographic factors, such as the composition of the teaching body and the number of students (→ *Chapter Compulsory education, page 53*). With all other factors remaining constant, the age structure of the teaching body provides an indication of how many teachers will be needed to

1 Exceptions include actual forecasting instruments that are used in Switzerland, e.g. in the Canton of Geneva: Gestion prévisionnelle des enseignants (see *Müller, Benninghoff & Alliata, 2005*) or in the Netherlands *Mirror* (see *OECD, 2005*).

173 **Teachers aged 50 and older, by region, 2003–7**

Proportion of compulsory-education teachers in Switzerland's major regions

Data: FSO



replace those retiring in the next few years. In Switzerland, the proportion of teachers over the age of fifty has increased, and is continuing to increase, in all the different regions of the country. The Federal Statistical Office (FSO) estimates that this proportion will reach 35% by 2010. The growing proportion of older teaching staff will lead to an increase in staff turnover rates and to a corresponding increase in recruitment needs (→ Figure 173).

Teacher recruitment also depends on the number of students and, more specifically, on annual changes in the number of students. Adjustments to student-teacher ratios take place with a time lag, however, and also at different speeds depending on whether an increase or a reduction is involved (see *Grob & Wolter, 2007*). The declining numbers of students (→ *Chapter Compulsory education, page 53*) should compensate to some extent for the decline in the number of teachers due to retirement, especially at lower-secondary level *(FSO, 2008b)*. In addition, factors such as student-teacher ratios, the number of lessons taught, the number of teaching hours and whether teachers have a 100% post or less, all have an impact on demand for teachers (*OECD, 2002; Santiago, 2004)*.

If these parameters are known, it is then possible to determine how many teachers need to be trained each year. Current data only allow us to make very rough estimates, however, since little information is available on how many teachers definitively leave the profession and when. If we base our estimate on past experience, with 5% of teachers definitively leaving the profession each year, an 85% success rate among students at universities of teacher education, and a 93% career entry rate (→ *Effectiveness, page 233*), this gives an annual replacement rate, for which new teachers must be educated, of around 6%. In other words, over the next ten years, the universities of teacher education would need to train enough teachers to fill a 6% gap each year as eligible teachers take their retirement (→ *example in the right-hand column* and → *Effectiveness, page 233*).

This training rate applies under normal conditions. If institutional changes also take place, such as an increase in the number of lessons or a reduction in classroom size, this will increase the replacement rate. Increased require-

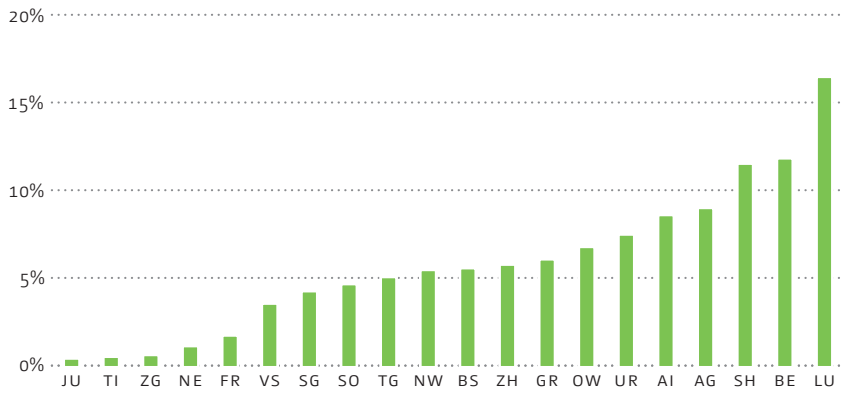
Training ratio: The FSO estimates that the fluctuation due to the retirement of teachers aged 55 and above will average 3.2% per year over the next ten years *(FSO 2008b)*. An additional 2–3% per year will leave the profession for other reasons (see *Henneberger & Sousa-Poza, 2002; Müller, Benninghoff & Alliata, 2005*). This 5–6% annual drain on the number of compulsory-education teachers will have to be compensated for by newly trained teachers. The total fluctuation rate (incl. teachers transferring to another job and teachers returning to the profession) is currently about 10% *(FSO, 2008b)*. In order to reach the 5–6% target, UTEs would actually need to train considerably more prospective teachers, because not all UTE students will successfully complete the teacher training programme and enter the teaching profession. Taking an 85% graduation rate and a 93% career entry rate, UTEs will need to train the equivalent of 6% of the existing teaching body each year.

Inappropriate recruitment refers to teaching vacancies filled by individuals who lack teaching credentials for the level of education in question (e.g. primary school teachers hired to teach students at lower-secondary level).

174 **Inappropriate recruitment at lower-secondary level, 2005/6**

Data: IDES

The cantons of AR and GE do not have any inappropriate recruitment; no data are available for the cantons of BL, GL, SZ and VD.



ments for teachers to be educated (additional teaching vacancies, continuing education and training, supplementary qualifications) also result if teaching positions are not occupied by persons with the correct training, as is currently the case (→ Figure 174), due either to pronounced fluctuations on the job market or to new teacher education requirements. The latter have been introduced in various cantons with the reform of teacher education (e.g. new training programmes for teachers at lower-secondary level in the Canton of Bern).

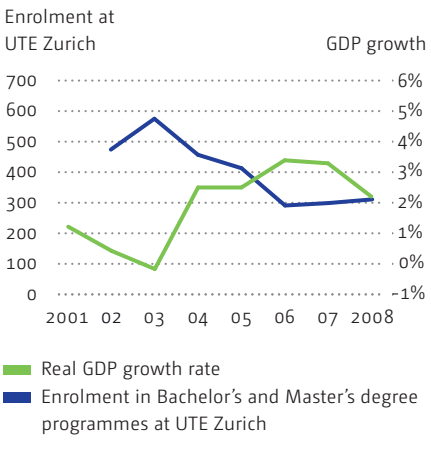
Economic climate

The economic climate also has an impact on career decisions (choice of studies, choice of occupation, choice of employment) and can make it difficult to predict how many teachers will be needed in the future. Regardless of the concrete demand for teachers in the different catchment areas, economic factors such as the general economic situation, the job situation or the appeal of a given occupation clearly cause fluctuations in enrolment that cannot easily be managed. The link between new enrolments and economic fluctuations can clearly be seen at the Zurich university of teacher education, for instance (→ Figure 175). The economic climate not only affects the number of new enrolments at universities of teacher education, it also has a major impact on whether currently active teachers remain in the profession. When the economic situation is good, more teachers leave their original profession, and when the situation is bad, more join it. The amount of time required for teacher education introduces an additional delay in the response to cyclical fluctuations on the job market (see *Dolton, 1990, 2006; Chevalier, Dolton & McIntosh, 2007; Wolter & Denzler, 2004*).

Timely intervention on the part of government players requires the appropriate monitoring, with allowance for all the relevant influencing factors. The actual balance between supply and demand for teaching staff can also be precisely determined and observed through monitoring of this type (→ *Effectiveness, page 233*).

175 **Student enrolment and economic cycle**

Data: FSO



Institutions

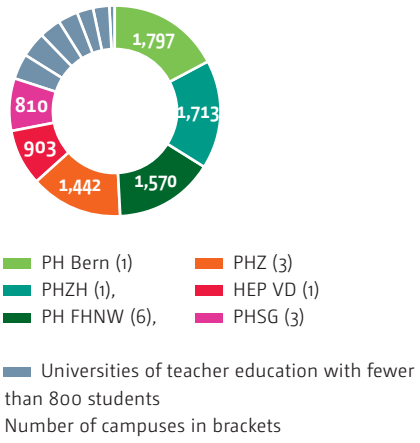
Concentration process

The implementation of the teacher education reform process and the creation of universities of teacher education was accompanied by major restructuring and a concentration process, with more than 150 traditional institutions for teacher education giving way to a good dozen newly established universities of teacher education. This led to a simplification and Swiss-wide harmonisation of teacher education structures (see *Lehmann, Criblez, Guldimann et al., 2007*). Today, prospective teachers enrol in one of eighteen different institutions of teacher education at university level *(COHEP, 2008)*. Nevertheless, there are still considerable differences between the individual universities of teacher education. Their size alone paints a heterogeneous picture (→ Figure 176): the three largest ones account for half of all the students enrolled in teacher education programmes, while the six largest ones have over four-fifths of upcoming teachers, and the remaining one-fifth of students are distributed among seven different universities of teacher education in eleven different locations. In the very small universities of teacher education with fewer than 300–400 students spread out over different campuses and study programmes, it is also necessary to monitor the quality, effectiveness and efficiency of the teacher education programmes.

Student mobility between the different universities of teacher education is currently very limited. On average, about 80% of students enrolled in a UTE come from the region responsible for running the university. There also does not seem to be any correlation between the size of universities of teacher education and the number of students from outside the region running the university (→ Figure 177). UTEs that receive intercantonal funding (e.g. PHZ and PH FHNW) tend to draw a smaller proportion of students from outside their respective regions.

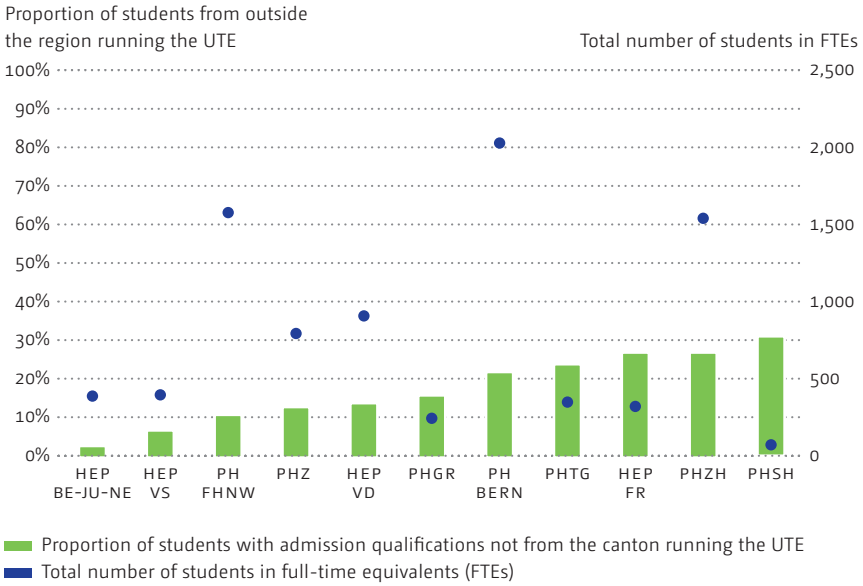
176 **Universities of teacher education by number of students 2007/8**

Data: FSO



177 **UTE student mobility, 2007**

Data: FSO



There would seem to be a balance between supply and demand for enrolment in universities of teacher education. There are no shortages in teacher education programmes in specific fields. This means, however, that if student demand remains constant, the only way for individual universities of teacher education to grow is by drawing students from other parts of Switzerland. Such competition between neighbouring UTEs would only make sense, however, if the criterion was better quality. Otherwise, mutually attempting to attract each other's students would be inefficient.

In view of the rising demand for teaching staff in the coming years (→ *Context, page 226*), all universities of teacher education could train more prospective teachers without creating an oversupply of teachers. The problem of smaller universities of teacher education would still remain unresolved, however. It is not possible to determine what would constitute the optimal size of a university of teacher education, since insufficient research has been carried out on this point. This information is important, though, and should be taken into account in a monitoring system. Even if effectiveness is not a problem at small universities of teacher education, possible inefficiencies cannot be ruled out. Over the past few years, universities of teacher education have strongly expanded their research and development and continuing education and training activities, and the overhead costs for these activities will presumably be disproportionately high below a certain size of UTE.

Due to specific federal and regional characteristics, the institutional landscape remains relatively complex (→ Table 178). The various universities of teacher education have different institutional structures: some are independent universities, others are part of training networks run by intercantonal bodies in some cases, and others are sub-units of universities of applied sciences.

The conventional universities have traditionally been responsible for training future upper-secondary level teachers, and only some of these study programmes have been transferred to universities of teacher education. Other alternatives have been found for those wishing to work as special needs educators (e.g. teacher education provided by intercantonal institutions) or as vocational education and training (VET) teachers, VET trainers, Federal Vocational Baccalaureate teachers, VET examiners or professional college teachers (Swiss Federal Institute for Vocational Education and Training).

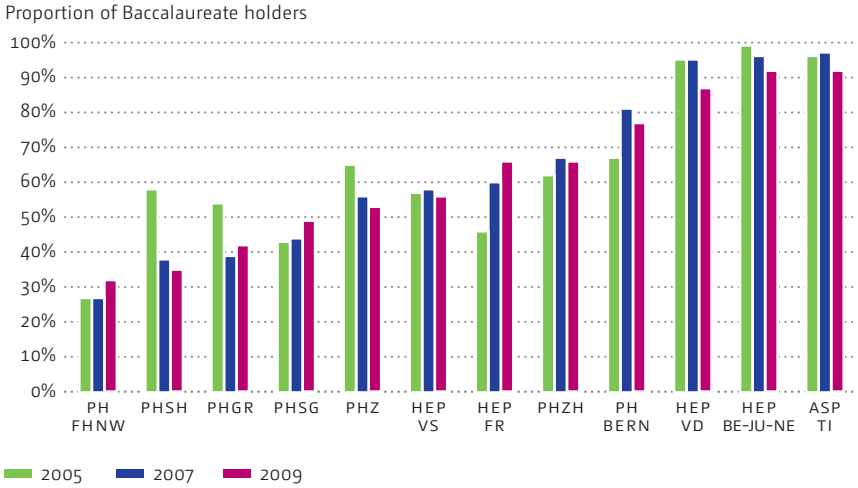
178 **Teacher education institutions**

Data: COHEP

			Degree programmes (continuing education and training courses excl.)					
	Number of institutes	**Number of campuses**	Pre-school/ primary school	Lower-secondary	Upper-secondary	Lower- and upper-secondary	Upper-secondary VET	Special needs education
Universities of teacher education	13	26	23	10	5	2	–	7
Conventional universities	3	3	1	1	2	1	1	3
Other colleges	2	4	–	–	–	–	1	3
Total	18	33	24	11	7	3	2	13

179 **Holders of Baccalaureates enrolled in pre-school/primary school teacher training programmes**

Data: FSO



Heterogeneous access to universities of teacher education

According to the recognition rules issued by the Swiss Conference of Cantonal Ministers of Education (EDK), the Baccalaureate is the normal upper-secondary level qualification entitling the holder to enrol in a university of teacher education. For prospective teachers wishing to work exclusively in the pre-school sector, a recognised upper-secondary specialized school certificate will suffice. However, enrolment in universities of teacher education is also open to those who have completed an upper-secondary specialized school or school-based VET programme and those with a Federal Vocational Baccalaureate, plus those who have completed a VET school that offers dual-track VET programmes with several years' professional experience, providing that they show evidence of additional general education (generally in a special exam, or through a Federal Vocational Baccalaureate in education or the university aptitude test). The admission requirements increase with the level at which prospective teachers wish to work *(EDK, 1999a, b)*.

There are relatively large differences in the prior education of students enrolled in individual universities of teacher education (→ Figure 179). There are roughly three main profile groups. In the first group, which can be found primarily in UTEs situated in the western part of Switzerland, the vast majority of UTE students are holders of a Baccalaureate; in the second group, about 50% of UTE students are holders of a Baccalaureate, while, in the third group, 40% or fewer students are holders of a Baccalaureate. The current data situation does not enable us to draw conclusions with absolute certainty regarding the proportion of prospective teachers who are not holders of a Baccalaureate (see *EDK, 2008a*). As a result, it is not possible to determine whether UTE students without a Baccalaureate are primarily individuals who gained direct access to the UTEs through a Federal Vocational Baccalaureate in education or the university aptitude test for holders of a Federal Vocational Baccalaureate, or whether they were required to provide additional evidence of their performance (ability test or admission examination), or indeed whether they are primarily holders of a specialised school certificate, benefitting from the easier access for those wishing to teach in the pre-

school sector. In some of the UTEs that have a low proportion of Baccalaureate holders, structural factors are the reason. In the northwestern part of Switzerland, for example, many prospective teachers tend to be holders of a specialised school certificate.

The practice of applying different admission requirements for different courses, however, runs counter to the strategy of harmonising teaching qualifications (especially if the teacher education programmes for pre-school and primary school education are to be merged); it also runs counter to the efforts made by the UTEs to introduce Master's degree programmes for all categories of teachers in the compulsory education sector (see *COHEP, 2007*).

The proportion of UTE students holding a Baccalaureate does not therefore enable us to draw clear conclusions, since we do not know what impact their prior education has on the progression of their studies at UTEs or on their work as teachers. The only conclusion that can be drawn is that the objective of ensuring that only holders of a Baccalaureate are entitled to enrol in UTEs has not yet been reached.

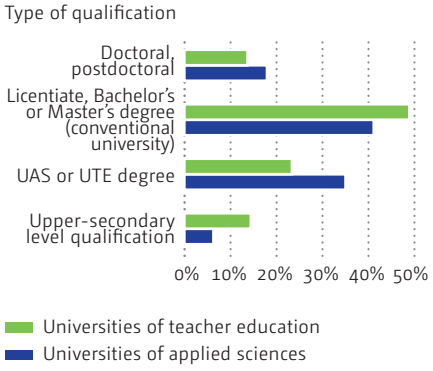
UTE lecturer qualifications

In order to position the universities of teacher education within Switzerland's university sector, reference is regularly made to the qualifications of the UTE lecturers. The current composition of UTE teachers, which varies tremendously from one UTE to another, is a reflection of the different structures of the universities of teacher education (→ Figure 180). Some UTEs have hired teachers from former teacher training colleges, and these teachers are still in the process of upgrading their qualifications. Today, around 60% of all lecturers employed at UTEs are holders of a university qualification and, of this percentage, one-third hold a doctorate (or even a postdoctoral qualification). However, this proportion varies sharply from one UTE to another (19–32%).

180 **UTE lecturer qualifications by type, 2007**

Proportion of all UTE lecturers

Data: FSO



If the current composition of teaching staff at UTEs is mainly the result of structural factors prevailing during the transition phase (see *EDK, 2008a*), then it is reasonable to assume that the qualifications of UTE teachers will fulfil the objectives of the Swiss Conference of Rectors of UTEs (i.e. that all UTE teaching staff should hold a university qualification) within the medium-term, irrespective of the right to award doctorates. The current practice, however, seems to indicate that individual UTEs are developing differently in terms of personnel, including in their criteria for the award of professorships.

When it comes to upgrading the qualifications of UTE teaching staff, it must be borne in mind that this potential is subject to pronounced limitations in the field of education science, for example, given the current university structures. Each year, 20–40 doctoral dissertations are submitted in the field of education science. When we compare this figure with the 2,000 or so lecturers at UTEs who lack doctoral qualifications, we can only conclude that the existing university structures do not suffice. The precarious situation at the university faculties of education, and particularly the chronic underfunding, has long been common knowledge (see *Criblez, 1999*). The strategy of individual UTEs to turn to and co-fund university chairs (e.g. at the University of Basel or the University of Konstanz) is therefore understandable within this context.

Effectiveness

An empirical assessment of the effectiveness of teacher education is required now that teacher education in Switzerland has been overhauled with the introduction of the UTEs and their positioning as universities. It is also important to determine whether the education system as a whole is performing as it should. Carrying out such an assessment is far from simple, as is already evident in discussions on which teacher education factors should be considered (content, didactics and methodology, structuring of teacher education, etc.) or what effectiveness criteria should be used: should the effectiveness of teacher education be measured by taking into account subject and occupational expertise, the way teachers act in the classroom or through student performance (see *Blömeke, 2004*)? Should objective observation procedures or self-assessment be used?

The lack of harmonised terminology in researching these questions, plus dissimilar research methods, make it difficult to achieve consistent research findings. There are practically no national empirical studies on the effectiveness of teacher education (see *Blömeke, 2004; Gauthier & Melouki, 2006; Gehrmann, 2007*). Even in the extensive US-based research publications, there is no general consensus on the correlation between teacher education and student performance; findings are inconsistent, the observed effects are relatively slight and it is not easy to transpose these findings to the Swiss context (see *Anderson, 2004; Darling-Hammond, 2000; Wilson, Floden & Ferrini-Mundy, 2001; Cochran-Smith & Zeichner, 2006*).

As far as the importance of teacher quality for student performance is concerned, a very large number of research publications draw a systematic correlation between teacher fixed effects, which remain constant over time, and student performance. That having been said, it is extremely difficult to identify relevant observable teacher traits that are responsible for student performance (see *Wayne & Youngs, 2003; Rockoff, 2004; Rivkin, Hanushek & Kain, 2005; Lipowsky, 2006*).

Comparisons of cohorts with newly recruited teachers show that various student skills, particularly cognitive skills, have decreased over the past few decades (see *Grönqvist & Vlachos, 2009*). There has been no agreement, however, as to whether or not this trend can be ascribed to a corresponding decrease in the quality of classroom teaching. Research findings on the matter are inconclusive. The latest studies seem to indicate that teachers do not have a statistically significant impact on the development of cognitive and social abilities among students *(Grönqvist & Vlachos, 2009)*. Teacher quality cannot therefore be automatically equated with general skills or intelligence quotients. Moreover, it would seem that the effects differ among different categories of students (ability groups or background) *(Rivkin, Hanushek & Kain, 2005; Goldhaber & Anthony, 2007; Grönqvist & Vlachos, 2009; Kukla-Acevedo, 2009)*.

It would also appear that specific subject expertise is central to good classroom teaching and subsequently stronger student performance. In mathematics, in particular, positive correlations were found between the subject expertise of teachers and the academic achievement of students (see *Angrist & Lavy, 2001; Lipowsky, 2006*). Questions have been raised as to whether these findings can be transposed to Switzerland, since teacher education and

Basing themselves on Oser's standards *(Oser, 2001; Oser & Renold, 2005)*, authors *Baer, Guldimann, Kocher et al. (2009)* gathered self-reported and third-party **assessments of the competencies** and **standard attainment** of UTE students enrolled at three UTEs in Switzerland and Germany. Although the longitudinal data compiled for 37 UTE students revealed significant improvements in teaching competencies, these competencies were still far from the desired standard (measured in terms of the maximum points threshold). This means that UTE students still do not have a high enough level in the requisite competencies. Moreover, there are major differences in the various skill groups. While UTE students improved their didactical skills, their knowledge of subject matter did not improve. It is difficult to interpret the effectiveness of teacher training programmes because of the high degree of scatter in all the variables, which is also increasing over time *(Baer, Dörr, Fraefel et al., 2007; Baer, Guldimann, Kocher et al., 2009)*.

It is difficult to determine the **impact** that **specific teacher traits** have on students' academic achievement. In addition to the problem of developing teaching competencies in a manner that makes them operational, such analysis needs to take into account a large number of contextual factors (both student and teacher traits). Teachers are not assigned to schools and students by chance; for this reason, selection errors and student outcomes must be compared longitudinally to the initiatives taken to bring added value. This will make it possible to establish effect variables that are more or less valid.

recruitment practices in the United States differ considerably from those in Switzerland. In their longitudinal study of performance data of German primary school children, *Tiedemann and Billmann-Mahecha (2007)* found no positive effects on student performance with teachers who had completed specialist studies in their subject. *Bressoux, Kramarz and Prost (2008)*, who conducted their study using comprehensive administrative data in France, found positive correlations between subject expertise and student performance. They also demonstrated that a lack of teaching methodology was more easily compensated for by subject expertise than vice-versa.

As far as the identification of effective teaching skills is concerned, it would seem that individual factors play less of a role than a combination of cognitive and non-cognitive skills (see *Kane, Rockoff & Staiger, 2008; Darling-Hammond, 2006; Oser, 2006; Oser, Salzmann & Heinzer, 2009*). As mentioned earlier, this makes the task of measuring the effectiveness of teacher education extremely complex and difficult.

Moreover, very heterogeneous study schedules make it more difficult to compare institutions (see *Lehmann, Criblez, Guldimann et al., 2007*) and there are no suitable standardised instruments to measure the progressive acquisition of skills in teacher education programmes (*Frey, 2004*). Finally, research findings do not provide any indications as to the optimal arrangements and structure, the most appropriate institutional form or the best duration of teacher education programmes. Determining the most effective teacher traits and how these traits may be developed in teacher education programmes therefore remain a central focus of research.

In addition to assessing teacher education effectiveness from a qualitative standpoint, it is also important to assess effectiveness from a systemic angle. Here we are interested in the relationship between the number of teacher qualifications issued and the size of the teaching body, i.e. UTE training ratios. Monitoring the system requires indicators (e.g. graduation rates, career entry rates, career continuance rates) that can be measured periodically for purposes of optimising effectiveness (see *Lehmann, Criblez, Guldimann et al., 2007*) (→ *Context, page 226*).

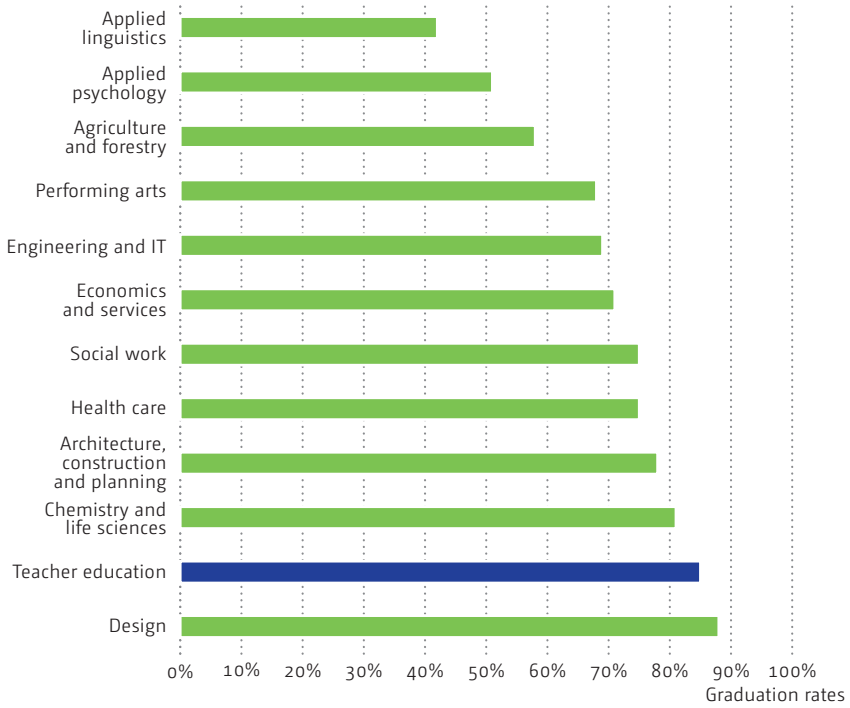
Graduation rates

At 85%, UTEs[2] have relatively high graduation rates compared with other areas within the universities of applied sciences (→ Figure 181). Conventional universities have a graduation rate of just under 70% on average (including transfers to other fields of study). Taken in isolation, it is difficult to interpret such an indicator. Since universities of teacher education do not select students for admission, and students themselves select the type of university and field of study they desire *(Denzler & Wolter, 2008, 2009b)*, it is not possible to draw a direct correlation between graduation rates and the type of institution. From a qualitative standpoint, a high graduation rate could be an indication that the university is very effective (i.e. reaches its objectives) or it could be an indication that the institution has lower quality expectations

2 Only integrated UTEs were taken into account in this comparison; those that are not integrated nevertheless have similarly high graduation rates on average.

181 **UAS graduation rates, 2002 cohort**

Data: FSO



and is less selective in its training programmes. Generally speaking, fields of study for which there is no selection for admission should have lower graduation rates than more selective fields of study. This is because unsuitable students who are not eliminated prior to commencement of the field of study will need to be eliminated prior to completion.

Training ratios

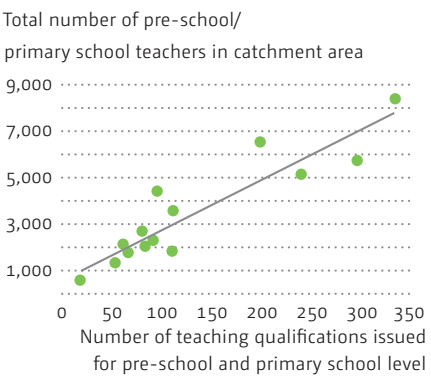
The primary objective of universities of teacher education is to train a sufficient number of new teachers. The annual number of qualifications should be sufficient to replace teachers who leave the profession. The number of newly trained teachers should not be disproportionately high, however, since it would not be efficient to train a large number of teachers over the years if these teachers were then unable to find available positions after graduation (→ *Context, page 226*).

It is not an easy matter to determine a basis against which the number of graduates at each UTE can be set. Too little information is available here (e.g. origin of prospective teachers, location where they begin their teaching career), which means we have to settle for relatively rough estimates.

If we compare the number of qualifications issued by the UTEs with the size of the teaching body in the primary catchment area (normally the canton in which the UTE is located), we find a linear correlation (→ Figure 182). This means that the size of the individual UTE is directly proportional to the size of the canton in which it is located. Generally speaking, each year a UTE will train 3.5% of pre-school and primary school teachers in its primary catchment area; some UTEs will tend to train a few more and others a few less. However, there are no UTEs that train a disproportionately higher

182 **UTE training ratios, 2006**

Data: FSO



Foreign teachers are mainly recruited when there are shortages of locally-trained teachers. In 2006, around 1% of the new teachers at lower-secondary level were recruited from outside Switzerland. The proportion varies from 0 to 10% and is considerably higher in cantons located near the Swiss border. The Swiss job market is attractive to foreign teachers, and this is reflected in an increasing number of applications for the recognition of foreign qualifications. With the entry into force of the bilateral agreement between Switzerland and the EU on the free movement of persons, the number of applications from EU nationals has risen sharply. Of the 600 applications received in 2008, 70% came from neighbouring countries (and half of these, in turn, from Germany), 15% came from other EU member states, and the remaining 15% came from third states. These applications led to recognition in a good 60% of the cases for qualifications issued in neighbouring countries, in 40% of the cases for qualifications issued in other EU member states and in just under 10% of the cases for qualifications issued in non-EU states.

number of teachers than the others, which would normally be the case if UTEs in one canton were filling a demand for teachers in other cantons.

Assuming that new teachers would need to be trained to replace the roughly 6–7% of teachers leaving the profession, as mentioned above (→ *Context, page 226*), the UTEs will need to train considerably more new teachers to fill medium-term needs in the compulsory education sector. If UTEs are unable to train enough new teachers, then education institutions will either have to hire inadequately trained candidates (→ *Context, page 226*) or recruit more teachers from outside Switzerland. Given the strong appeal of the Swiss job market, the latter is certainly a viable option (→ *text in the left column*).

Career entry

With a vocationally-oriented course of study like teacher education, an important training objective is to effectively and efficiently facilitate career entry, and hence the entry rate into teaching must also be taken into account.

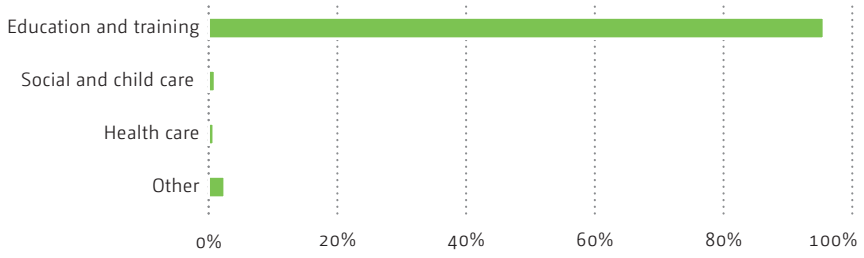
According to data from the FSO's Swiss Graduate Survey (respondents contacted one year after graduation), over 90% of all graduates of Swiss universities of teacher education find teaching positions (→ Figure 183). This reported career entry rate can be rated as high compared with other findings. Research conducted in connection with the Erlangen study on teaching careers found that 71% of the graduates of teacher education programmes in Germany had found employment as teachers within three years of graduation *(Abele, Dette & Hermann, 2003)*. Another study reported career entry rates of 63% (full-time employment) and 11% (part-time employment) within four to six years of graduation (*Lipowsky, 2003)*. For the Canton of Bern, *Herzog, Herzog and Brunner (2007)* reported a career entry rate of about 80%. About half of all graduates leave the teaching profession in the course of a full teaching career. Most graduates remain in the education sector, however, with only 10% stopping teaching entirely *(Herzog, Herzog & Brunner, 2007)*.

Successful career entry (see *Huberman, 1991; Lipowsky, 2003; Larcher Klee, 2005*) can also be considered an indication of successful teacher education programmes that prepare teachers to exercise their profession. Career entry should thus also be assessed in an impact study. Comparing different training concepts and programmes, it would seem that teacher education that brings prospective teachers in contact with realistic teaching situations is associated with greater effectiveness in terms of student progress later on (see *Boyd, Grossman, Lankford et al., 2008*).

183 **UTE graduate fields of employment**

Field of employment one year after graduation, 2005

Data: FSO, calculation: SCCRE



In terms of efficiency, it is also important to determine whether career entry rates would improve if UTEs selected candidates for admission, or if the training programmes themselves were more selective, or, indeed, if greater attention was paid to candidates' teaching aptitudes (see *Bieri Buschor, Schuler Braunschweig & Stirnemann Wolf, 2006; Foerster & Faust, 2006; Ettlin, 2006*).

The latest research findings show that the career entry stage for teachers is not so much a self-contained phase that can be mastered through specific preparations but is rather the result of a series of facilitating factors and, more specifically, personality traits, which can only be influenced by training to a minor extent (see *Albisser, Kirchhoff, Meier et al., 2007; Keller-Schneider, 2007, 2008, 2009*).

Income

When assessing the effectiveness of teacher education, we must also consider the economic implications of education and training, which influence both the choice of field of study and employment. The situation on the job market, employment prospects, and higher/lower income potential for comparable professions (relative salary) are all factors that can influence a person's decision to pursue a specific field of studies or career. These factors are taken into account by both prospective students and graduates.[3]

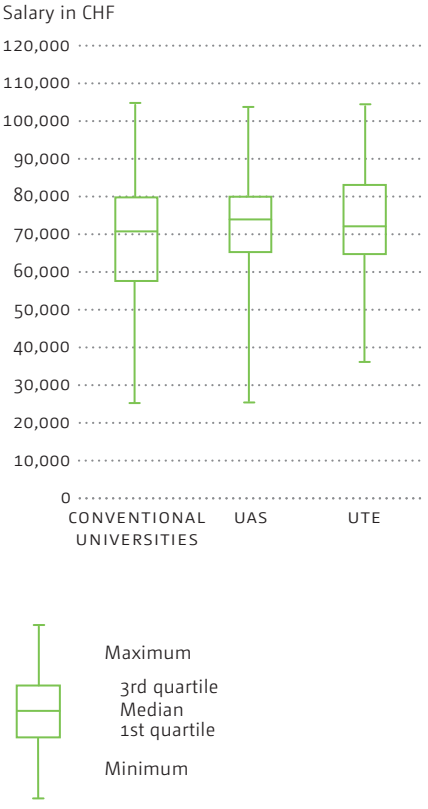
According to the FSO's Swiss Graduates Survey, UTE graduates have a higher income potential than graduates from UAS and conventional universities, giving due consideration to age and extent of employment as well. UTE graduates earn relatively good starting salaries compared to UAS graduates (→ Figure 184). Moreover, part-time employment is more frequent in the teaching profession. The higher income potential makes it easier for teachers to work fewer hours than a full-time post.

The higher income potential for teachers is particularly beneficial for women, since they face more wage and career discrimination in non-teaching professions with similar education requirements. From an economic standpoint, this would explain the large proportion of women enrolling in teacher education programmes and subsequently working as teachers *(Wolter, Denzler & Weber, 2003; Wolter & Denzler, 2003)*.

184 **Graduate salary levels, 2007**

Data: FSO, calculation: SKBF

Gross annual salary, one year after graduation, standardised for a full-time position



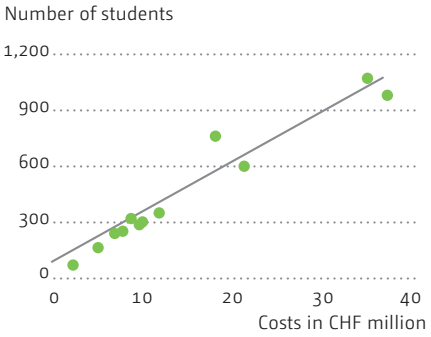
Efficiency/Costs

Since 2005, both UTEs and UAS have been required to use the same UAS standard cost accounting model in their financial reports. While this should essentially lead to greater transparency of costs, the quality of the data is not yet good enough for making detailed cost comparisons (there is still the

3 See comprehensive research on the income elasticity of university graduates (e.g. *Murnane, Singer, Willet et al., 1991; Vegas, Murnane & Willett, 2001; Chevalier, Dolton & McIntosh, 2007*; an overview can be found in *Denzler & Wolter, 2009a*).

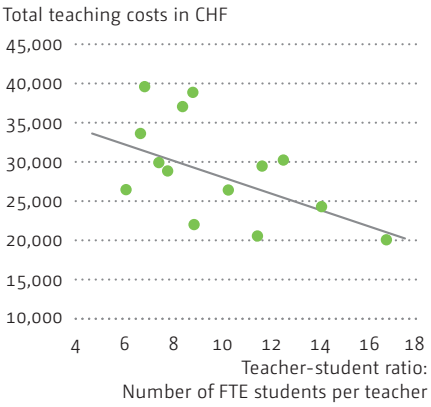
185 **Total (teaching/training) costs and number of students in FTEs, 2007**

Data: FSO



186 **Annual (teaching/training) costs per student and teacher-student ratio, 2007**

Data: FSO



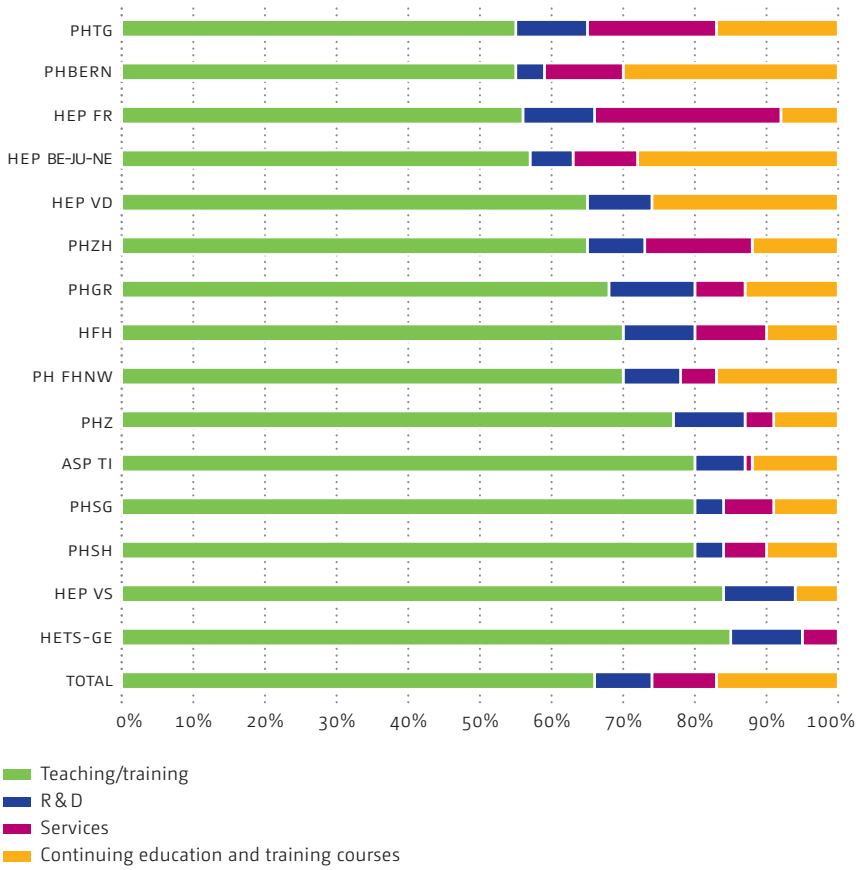
problem of transposing the UAS cost accounting model to UTEs). Moreover, the data do not lend themselves to impact studies, which prevents us from drawing conclusions regarding efficiency. The following paragraphs are therefore limited primarily to a description of the various costs.

The average annual cost per student enrolled at universities of teacher education amounted to about CHF 30,000 in 2007 (standard deviation: CHF 4,000). Based on the latest figures, the size of a university would not seem to have any impact on average costs (→ Figure 185). This means that no evidence of economies of scale has so far emerged at the larger UTEs.

Differences in the cost per student can be attributed inter alia to major differences in the cost structures for the individual types of activity (teaching, research, continuing education and training, and provision of services) (→ Figure 187). However, no consistent patterns have been observed. It would also seem that different teacher-student ratios would explain part of the difference in costs (→ Figure 186). Compared to other areas within the UAS, UTE teacher-student ratios are generally good, and such ratios would seem to be the most significant cost factor, also explaining the differences between university types as well as the fluctuations over time. Just as schools at upper-secondary level are relatively inflexible in responding to fluctuations in student numbers, so are UTEs unable to reduce their teaching staff if there is a short-term drop in enrolment numbers.

187 **Costs per activity, 2007**

Data: FSO



Equity

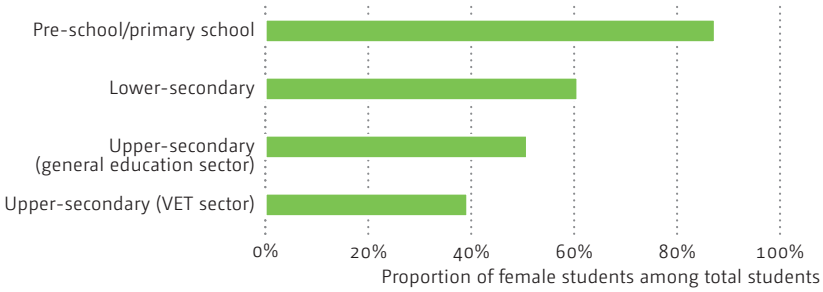
The following paragraphs describe the UTEs from the standpoint of equity. The main question here is to determine whether various social groups are more/less likely to complete a course of study at a UTE. Research focuses specifically on such variables as gender, social origin and migration background to determine whether they exert an influence on participation rates. If inequities are observed, the question is then to determine why they have come about: are they the result of failure to adhere to the equity principle or is the inequitable distribution merely the result of free choice?

Gender bias in the choice of studies and «feminisation» of the teaching profession

As far as gender ratios among UTE students are concerned, we find level-specific differences which are the same as those that can be seen within the teaching profession itself. The higher the level of education at which prospective teachers wish to teach, the lower the proportion of women (→ Figure 188). Among prospective teachers wishing to teach at the pre-school and primary levels, the proportion of women stands at way above 80%, while among prospective teachers wishing to teach at upper-secondary level, the proportion of women graduates is just under 50%. These proportions have remained relatively stable since 2001, prompting the question as to what extent gender segregation depends on the level of education at which prospective teachers wish to teach and is thus status-dependent (see *Borkowsky, 2001; Larcher Klee, 2002*). The «feminisation» of the teaching profession, i.e. the increasing proportion of female teachers (see *Jacobi, 1997*), only becomes evident in long-term studies, however. Over the past twenty years, the proportion of women working as teachers at all school levels has increased (→ Figure 189). At the lower-secondary level, the proportion has risen from about 20% in 1995 to just under 50% in 2005. The increasing proportion of female teachers, therefore, seems to be a long-term trend that is mainly cohort-dependent, i.e. the proportion of women increases over time from one cohort to the next (see *Eckert, 2006*).

188 **Proportion of female students at universities of teacher education by programme, 2007/8**

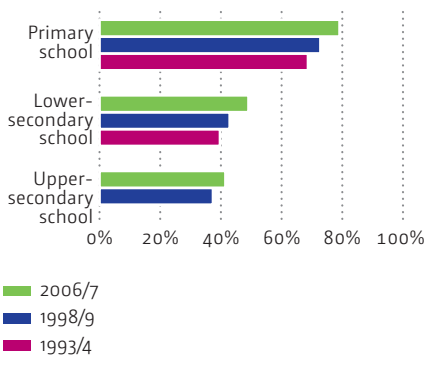
Data: FSO



189 **Female teachers**

Proportion of female teachers among total teachers

Data: FSO



Other explanations for the increasing proportion of female teachers may be the expansion of education and, coupled with this, the continuous efforts to ensure gender equality in education. Starting in the 1980s, these efforts extended to higher levels within the compulsory education sector. After the corresponding time lag, there was then a gradual increase in the number of women working at lower-secondary and upper-secondary levels. At the same time, legal and economic factors must also be taken into account in explaining this phenomenon: employment conditions, part-time employment options, and equal wages for both male and female teachers compared to other professions on the job market. Over their entire careers, women who teach at all levels in Switzerland earn clearly higher salaries than women working in other professions with comparable qualification levels (see *Wolter & Denzler, 2003*).

These different starting points for men and women, due primarily to the widespread discrimination that still persists against women in terms of both income and career development prospects, provide an economic explanation for gender bias in the choice of studies and professions.

Moreover, gender-specific factors must be taken into account in the choice to study at a UTE (see *Denzler & Wolter, 2008, 2009b*), which, beside practical aspects such as the desire to strike a balance between career and family, might also comprise more problematic gender stereotypes (see e.g. *Scheuring & Burkhardt, 2006*). The effects of gender segregation in the choice of studies also seem to intensify in direct proportion to the higher education level to which prospective teachers aspire *(Schnabel & Gruehn, 2000)*.[4]

On the whole, however, there are no indications that this development constitutes a violation of the equity principle. There would also not seem to be a correlation between the gender of teachers and student progress (see *Blum-Brunner, 2001*).

Social background of students

Both social and educational background have a direct impact on a student's choice to enrol in a university of teacher education in order to become a pre-school/primary school or lower-secondary school teacher. Baccalaureate holders wishing to study at a UTE generally come from families whose parents lack academic qualifications *(Denzler, Fiechter & Wolter, 2005; Denzler & Wolter, 2008, 2009b; Périsset Bagnoud & Ruppen, 2006)*.

The impact of institutional aspects (Baccalaureate profile, universities available locally, study duration) seems to indicate that the choice of studies is mainly a choice between different types of university. It is not clear, however, whether this decision depends on the person's background or other factors (peers, among other things) *(Denzler & Wolter, 2008, 2009b)*.

4 The choice to become a teacher depends heavily on the choice of specialism listed in the Rules on the Recognition of Baccalaureates (MAR). Baccalaureate holders with a specialism in music have a considerably higher preference for the teaching profession. The choice of main subject studied is also strongly gender-biased (see *Denzler & Wolter, 2008*). According to data from the EU's PISA 2006 study, there does not seem to be a gender bias among students streamed to a high-ability group at lower-secondary level who expressed an interest in becoming teachers.

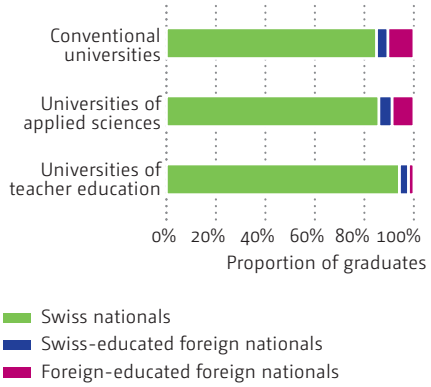
The way in which students self-select their enrolment in a teacher education programme has a significant impact on the future composition of the teaching body and therefore also on the effectiveness of the education system (→ *Effectiveness, page 233*).

Students with a migration background who enrol in universities of teacher education

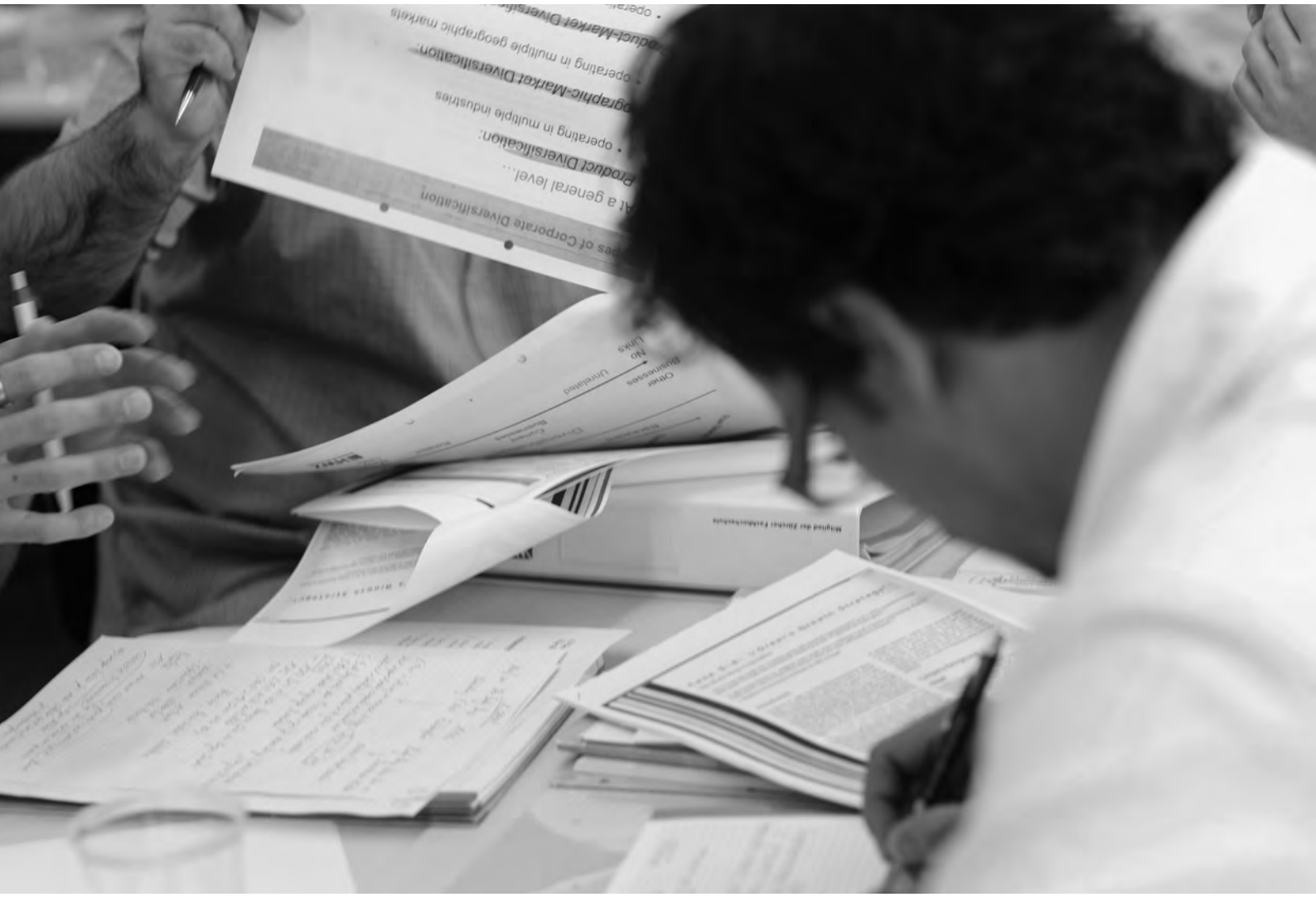
Only a minority of students enrolled in UTEs have a migration background. Compared to other UAS degree programmes, the proportion of foreigners enrolled in teacher education programmes (whether their upper-secondary level qualifications were issued in Switzerland or abroad) is lower (→ Figure 190). One reason for this may be student self-selection: foreigners who are entitled to enrol in a Swiss university tend to prefer enrolment at a conventional university (offering greater prestige or better international mobility). In addition, it would seem that teacher education programmes with a heavy regional or national slant are less appealing to foreign-educated foreigners.[5]

Finally, students with a migration background have to overcome major hurdles at various transition points to make it through the Swiss education system (→ *Chapter Compulsory education, page 53*, → *Chapter Lower-secondary education, page 89*, → *Chapter Baccalaureate schools, page 121*, → *Chapter Universities, page 185*). This is why the proportion of individuals with a migration background enrolled in Swiss universities is very low. Nevertheless, this reason is not sufficient to explain the significantly lower proportion of students with a migration background enrolled in universities of teacher education.

190 **University graduates**
by migration status, 2007
Data: FSO



5 While the proportion of foreigners enrolled in UTEs is low, there is a considerably higher proportion of foreigners working as teachers. This may be explained by the strong appeal of the Swiss job market and changes to employment law (bilateral agreements between Switzerland and the EU as well as equivalency procedures to recognise foreign qualifications) (→ *Effectiveness, page 233*).



Tertiary-level B professional education and training (PET)

Overview

Article 26, paragraph 1 of the Federal Vocational and Professional Education and Training Act (SR 412.10), sets out the objectives of tertiary-level B professional education and training (PET) as the transfer and acquisition of the «competencies needed to carry out a demanding occupational activity or an activity that involves responsibility». The Federal PET Diploma Examination and the Advanced Federal PET Diploma Examination test the ability of candidates to perform activities (either technical or management-related) which are subject to more stringent requirements than completed vocational education and training (VET) at the level of the Federal VET Diploma. The Advanced Federal PET Diploma Examination establishes whether candidates have the ability to run a small or medium-sized enterprise independently or to act as experts in their field.

According to Art. 26, paragraph 2 of the Federal Vocational and Professional Education and Training Act, holders of a Federal VET Diploma or those who have completed an upper-secondary level general education, or hold an equivalent qualification, may enrol in PET programmes. In other words, the PET sector is the only portion of the tertiary-level education sector that does not require a Baccalaureate/Federal Vocational Baccalaureate for regular admission. This does not mean, however, that there are no students with such qualifications in PET programmes. Many of the students preparing for the Advanced Federal PET Diploma in Corporate Auditing, for instance, already hold a qualification from a UAS or a conventional university.

With the enactment of the presently valid Federal Vocational and Professional Education and Training Act in 2004, PET programmes are now legally anchored at tertiary level alongside cantonal universities, Switzerland's two federal institutes of technology (ETHZ and EPFL), the universities of applied sciences and the universities of teacher education. However, a clear distinction is drawn at tertiary level between (university-based) tertiary-level A (ISCED 5A) and tertiary-level B (ISCED 5B). PET programmes fall into the latter category. This is reflected in the admission requirements as well as in the type of programmes, the duration of the education and training and the titles issued (but not necessarily in the job market prospects). Tertiary-level B professional education and training takes in the Federal PET Diploma Examination, the Advanced Federal PET Diploma Examination (also referred to as the *Meisterprüfung*) and the PET Colleges.

Holders of PET qualifications may enrol in UAS degree programmes without having to obtain a Federal Vocational Baccalaureate. On the basis of an application procedure, candidates may also apply for recognition of the knowledge and skills they have gained from PET for the award of credits towards the UAS Bachelor's degree. The UAS admitting the student decides if these credits can be given.

191 **Overview of Switzerland's PET sector**
Data: SCCRE research

	Admission requirements	Duration	Providers	Full-time/ part-time	Qualification
Professional colleges	Upper-secondary level qualification and work experience in some cases	2–3 years	Private and public schools	Full-time or part-time	Professional college degree. Example: Professional College Degree in Nursing
Federal PET Diploma Examination	Upper-secondary level qualification and a certain number of years' work experience in relevant field	Unspecified since attendance of preparatory courses is voluntary.	Trade associations; voluntary attendance of preparatory courses offered by education institutions, professional organisations as well as public and private schools	Part-time	Federal PET Diploma. Example: Federal PET Diploma in Construction Site Management
Advanced Federal PET Diploma	Federal PET Diploma and a certain number of years' work experience in relevant field	Unspecified since attendance of preparatory courses is voluntary.	Trade associations; voluntary attendance of preparatory courses offered by education institutions, professional organisations as well as public and private schools	Part-time	Advanced Federal PET Diploma. Examples: Advanced Federal PET Diploma in Cabinetmaking, Advanced Federal PET Diploma in Finance

PET colleges

The Federal Department of Economic Affairs' Ordinance on the Minimum Requirements for Recognition of PET College Degree Programmes and Continuing Education and Training Courses (SR 412.101.61) states the following: «PET college degree programmes and CET (continuing education and training) courses provide students with competencies needed to independently carry out technical and managerial responsibilities in their field. They are practical in focus and specifically develop the ability to think in a methodical and abstract manner, to analyse professional tasks and to apply the knowledge gained in a practical way.» Apart from upper-secondary level qualifications – Federal VET Diploma obtained upon completion of a three-year or four-year VET programme; specialised school certificate; Baccalaureate – candidates wishing to enrol in a degree programme or CET course at a PET college may be required to demonstrate a certain amount of professional experience and undergo an aptitude test. Admission requirements are decided by the individual PET colleges themselves and depend on the degree programme. The Ordinance covers the following fields: engineering; hotel, restaurant and catering (HORECA); business; agriculture and forestry; health care, social care and adult education and training; art and design; transport.

PET college degree programmes are based on national core curricula developed and issued by the PET colleges themselves in cooperation with professional organisations; the Federal Office for Professional Education and Technology (OPET) approves these core curricula at the request of the Federal Commission for PET colleges (EKHF).

The Federal Statistical Office (FSO) **continues to draw a distinction between qualifications that are federally regulated and those that are not**. Federally regulated qualifications include all qualifications issued upon completion of a degree programme at a professional college in such fields as engineering, business, business IT, gastronomy, tourism, forestry, etc. as well as all qualifications issued to individuals who have obtained the pass mark for the Federal PET Diploma Examination or the Advanced Federal PET Diploma Examination. All other qualifications are considered as not federally regulated. The Confederation intends to regulate qualifications in the health, social care and art fields in the near future. This will effectively double the number of professional college degrees issued. In 2008, the FSO reported a total of 8,050 degrees (including 3,058 degrees in nursing), 1,202 CET qualifications and 13,316 certificates in the non-federally-regulated category (⟶ Figures 193 and 194).

There are still certain unresolved issues where PET and UAS or vocational CET programmes overlap. Precisely in UAS post-graduate programmes (Certificate of Advanced Studies [CAS], Diploma of Advanced Studies [DAS] or Master of Advanced Studies [MAS]), a number of federal examinations have been duplicated, providing competition for these in the form of the UAS' own qualifications. In some fields, there is a parallel configuration of UAS (especially CET programmes), PET colleges and federal professional examinations with very similar final qualifications, which can lead to unconstructive competition between education and training providers and can confuse potential employers.

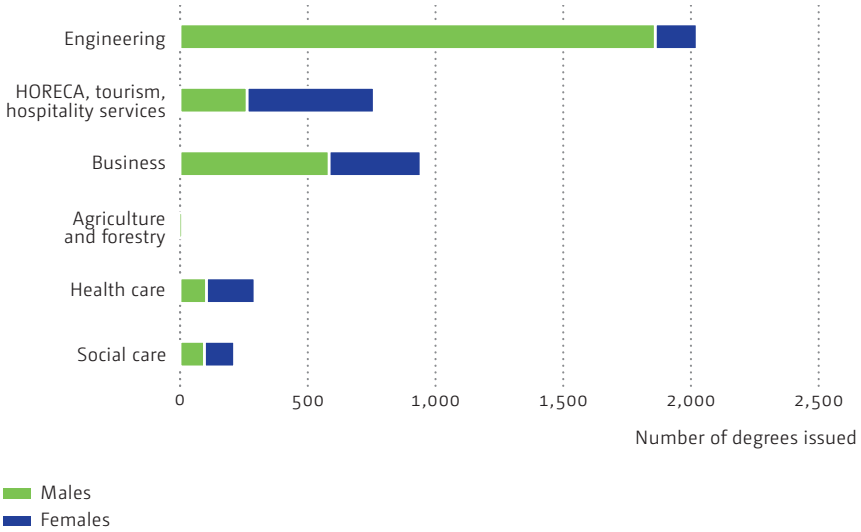
Students enrolled at PET colleges may study either full-time or part-time. With full-time enrolment, degree programmes last at least two years (including traineeships). With part-time enrolment, degree programmes last at least three years. Part-time students are required to have at least a 50% job in the field matching their studies. In 2008, 4,243 federally recognised PET college degrees were issued, with 69% of these qualifications being awarded upon completion of part-time studies and 31% upon completion of full-time studies. HORECA, tourism and hospitality services are among the few branches where most students are enrolled full-time.

Most PET college programmes are geographically concentrated in four cantons (Zurich, Bern, St. Gallen and Aargau). These four cantons account for around 55% of all PET college programmes.

Given the large number of corresponding programmes, most PET degrees are in the field of engineering, followed by the business degrees awarded by the PET colleges of economics (⟶ Figure 192). Around 32% of all PET college degrees are issued to women. As expected, the lowest proportion of female students can be found in engineering and the natural sciences and the highest proportion in services, education and health care.

192 **Professional college degrees by ISCED field, 2008**

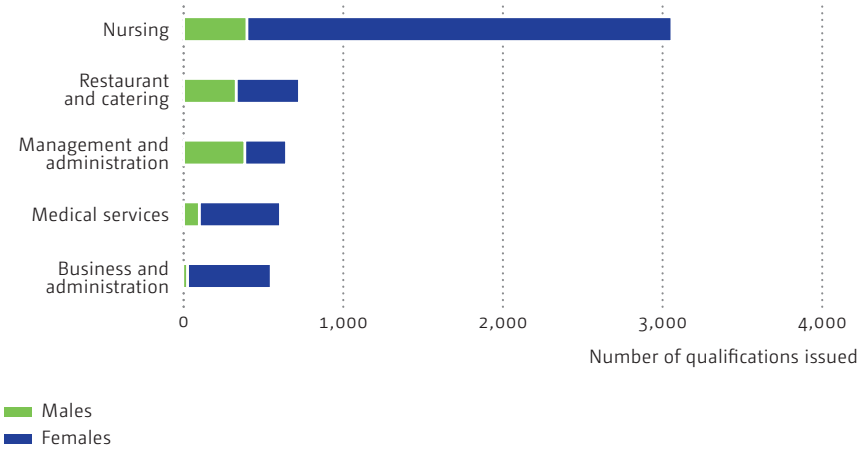
Data: FSO



193 **Non-federally-regulated PET qualifications, 2008**

The five most frequently chosen ISCED fields; a total of 8,050 qualifications

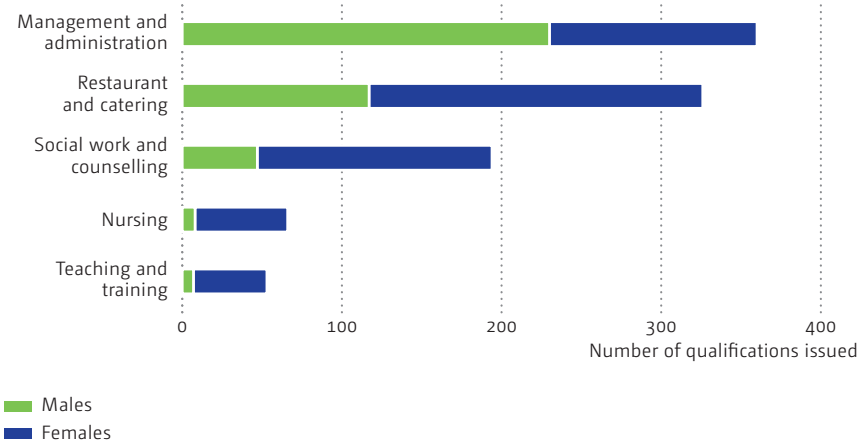
Data: FSO



194 **Non-federally-regulated CET qualifications, 2008**

The five most frequently chosen ISCED fields; a total of 1,020 qualifications

Data: FSO

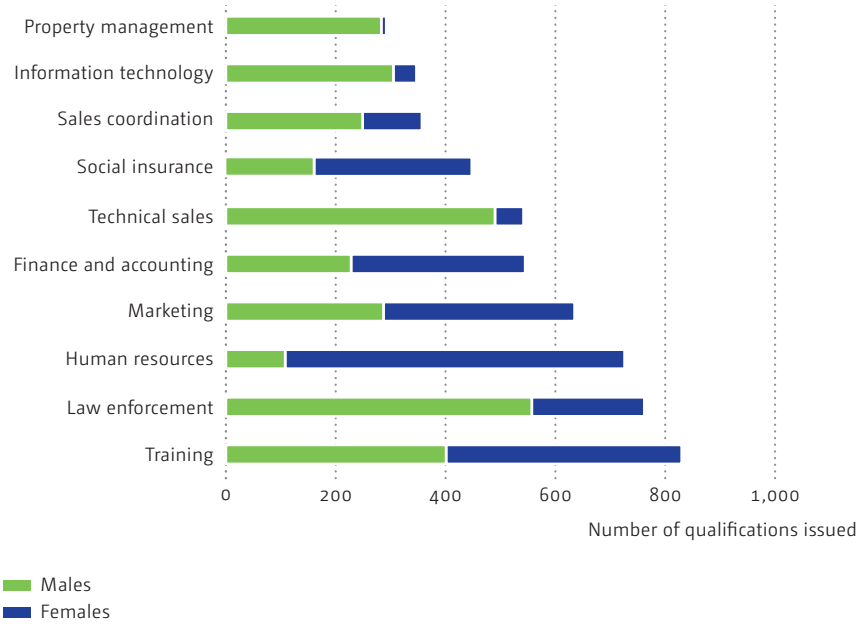


National professional examinations

With the enactment of the first Federal Vocational Education and Training Act in 1933, the Advanced Federal PET Diploma Examination (also referred to as the *Meisterprüfung* in the trades and industrial branches) was recognised at the federal level. The Federal PET Diploma Examination was introduced in 1963 with the enactment of the revised Federal Vocational Education and Training Act.

Unlike PET colleges, where the entire programme is federally recognised, only the content and mode of execution of the Federal and Advanced Federal PET Diploma Examinations are federally recognised. The initiative to create a new national professional examination always comes from a professional organisation, which is responsible for establishing the content. The Federal

195 **Top ten fields for the Federal PET Diploma, 2008**
Data: FSO



Office for Professional Education and Technology (OPET), for its part, supervises examinations and approves the examination rules. Within a given branch, OPET approves only one Federal and one Advanced Federal PET Examination for each specific field. As a rule, the latter examination is more challenging than the former.

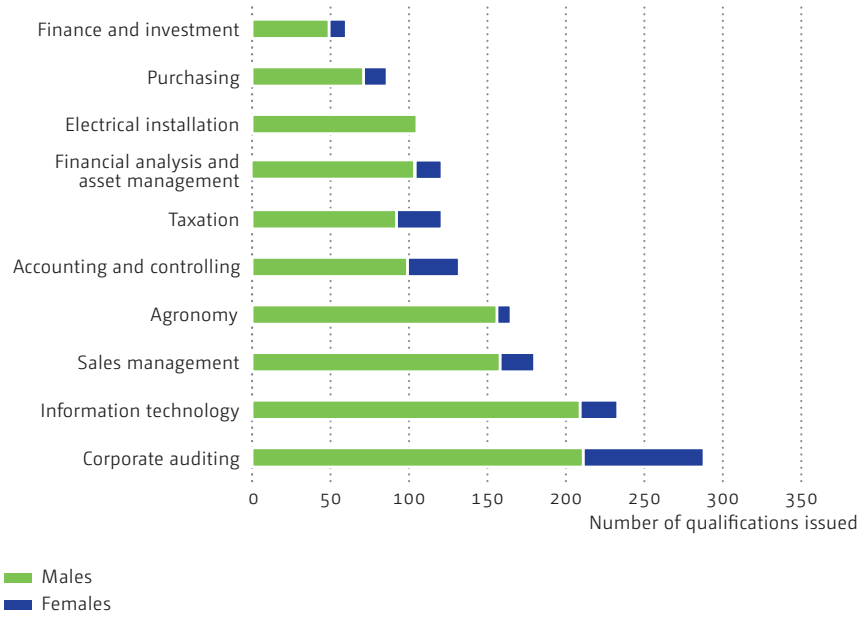
In order to be admitted to a national professional examination, candidates must have an upper-secondary level general qualification, or the Federal VET Diploma, plus a certain number of years of relevant professional experience (which varies sharply from one profession to another). In 2008, 12,468 Federal PET Diplomas were issued; 44% of these qualifications related to ten out of a total of 228 Federal PET Diploma professions (→ Figure 195).

The professional organisations are responsible for holding national professional examinations at annual or six-monthly intervals. Preparatory courses for these examinations are not regulated. It is up to examination candidates to decide how they wish to prepare for these examinations. They may either study on their own or enrol in courses offered by professional organisations, private PET providers, or public PET providers. Preparation for the Federal PET Diploma Examination is normally done on a part-time basis. An OPET survey of around 500 PET providers of preparatory courses established that 56% of all PET providers can be found in four cantons (Zurich, Bern, Vaud and Aargau). Around 32% of all PET providers are public institutions, 24% are PET centres run by professional organisations and 44% are private institutions. According to an OPET-commissioned study conducted by PricewaterhouseCoopers (PwC), 22% of all PET students are enrolled at a public institution, 34% are enrolled in a subsidised preparatory course given by a private institution and 44% are enrolled in a non-subsidised preparatory course *(Seiler, Muggli & Sommer, 2009)*.

Preparation for the Advanced Federal PET Diploma Examination can also be undertaken on a part-time basis. However, with a few exceptions, access

196 **Top ten fields for the Advanced Federal PET Diploma, 2008**

Data: FSO



to this examination is only open to holders of a Federal PET Diploma or other tertiary-level qualification. In 2008, 2,818 Advanced Federal PET Diplomas were issued. Around 53% of these qualifications related to ten out of a total of 168 Advanced Federal PET Diploma professions (→ Figure 196).

Whether it be in relation to the Federal or Advanced Federal PET Diploma Examinations or to PET college degree programmes, examination content is subject to regular revision to better delimit the individual training options, particularly vis-à-vis the CET programmes offered by the UAS. One objective is to better coordinate similar competency profiles or to consolidate existing examinations. Another objective is to harmonise the admission criteria for all the Federal and Advanced Federal PET Diploma Examinations. This objective is set out in Art. 23 of the Federal Vocational and Professional Education and Training Ordinance (SR 412.101). Examples of successful repositioning include real estate, logistics and the timber industry.

Costs and funding

The cantons are responsible for the implementation of PET programmes. Based on OPET surveys, the cantons contribute around CHF 460 million each year to the PET sector. This amounts to about 16% of all cantonal expenditure for Switzerland's VET/PET sector. Direct federal contributions are only made to PET college degree programmes if the programme in question has been developed by a national professional organisation that carries out its activities throughout Switzerland and if the programme does not already receive cantonal contributions.

With the enactment of the Federal Vocational and Professional Education and Training Act in 2004, the overall structure of the funding was changed at federal level from cost-based funding and payment to performance-based funding awarded per student. The Confederation provides the cantons with general lump-sum funding to cover cantonal VET/PET-related expenditure. The cantons are free to allocate this funding to VET and PET programmes as they see fit. Federal lump-sum funding to the cantons is based on the total number of students enrolled in upper-secondary level VET programmes.

While the restructuring of cantonal funding of the VET sector is practically complete, the same cannot be said for the PET sector. At the start of this chapter, we mentioned that the PET sector (i.e. the Federal PET Diploma Examination, the Advanced Federal PET Diploma Examination and the PET college degree programmes) was legally anchored within the tertiary sector when the presently valid Federal Vocational and Professional Education and Training Act came into effect, but PET sector funding has not yet been definitively settled (through a national ruling).

Public funding of the PET sector varies considerably and is not subject to any clearly defined rules and criteria. This is due to the historical growth of PET programmes and structures, and particularly the development of private PET sponsors and providers.

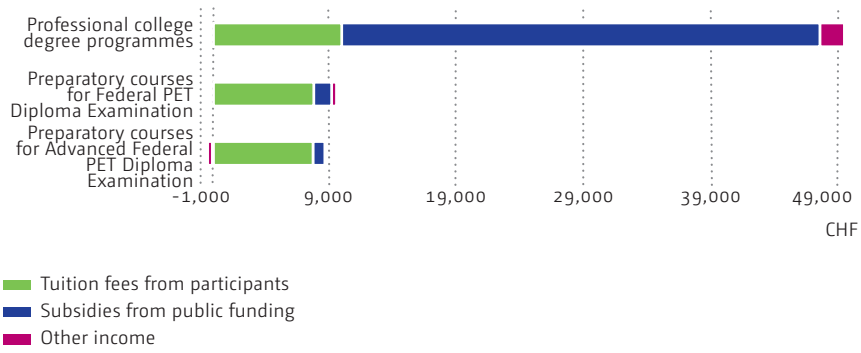
Financial compensation between cantons for students from one canton who enrol in a PET programme in another canton is handled only partly within the framework of an intercantonal agreement. The existing intercantonal agreement of 1998 on PET colleges needs to be revised to resolve the issue of PET funding. Many PET colleges receive funding from private sponsors but still receive full or partial funding from the cantons in which they are located as well.

While national professional examination subsidies come exclusively from the Confederation, the cantons provide subsidies for preparatory courses for these examinations, despite the fact that such courses are voluntary and unregulated.

PET tuition costs vary substantially and depend on the field (e.g. engineering, HORECA, tourism, etc.), the extent of public subsidies received by the PET provider, and therefore the canton.

197 **Cost/benefit ratios per participant from the providers' standpoint, 2006**

Data: PwC



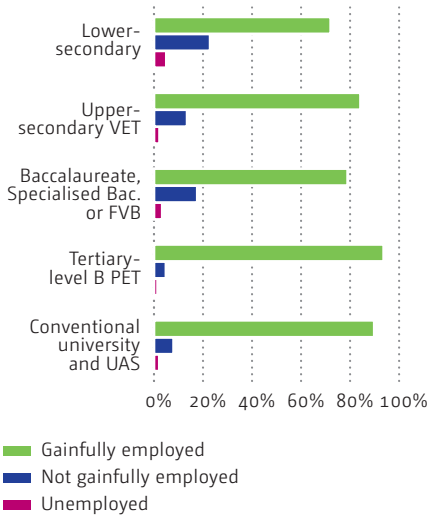
Tuition fees for PET college degree programmes are only about 30% higher than for preparatory courses for national professional examinations. This is despite the fact that the cost of degree programmes (CHF 49,475 over the entire duration) is five to six times higher than the cost of preparatory courses (between CHF 8,000 and CHF 10,000 over the entire duration) (→ Figure 197). The current level of differentiation between public subsidies to PET colleges and public subsidies to preparatory courses for national professional examinations is a direct manifestation of this.

Like degree programmes at the UAS and conventional universities, considerable public funding is provided to cover up to 80% of the costs of full-time PET college degree programmes, while part-time PET college degree programmes are subsidised by around 40%. Funding patterns for preparatory courses for national professional examinations are similar to those seen in the CET sector (→ *Chapter Continuing education and training (CET), page 253*). In the PET sector, employers contribute to the cost of examinations. Over 50% of all part-time students receive funding from their employers (who are able to deduct most of these expenditures from their taxes), with company size playing a major role in determining whether employees receive employer contributions or not (see *Schärrer, Fritsch, Dubach et al., 2009*). The risk of students changing employers after obtaining their PET qualification is higher for small-sized companies, which makes them less inclined to contribute to the cost of PET programmes. Seventy-two per cent of PET students who receive employer contributions receive them solely in the form of direct payments for tuition fees; 22% receive them in the form of paid time off from work as well.[1] Employer contributions to the costs of PET programmes amount to a total of CHF 36.8 million per year, which corresponds to an average contribution of about CHF 5,700 per person *(Schärrer, Fritsch, Dubach et al., 2009)*.

PET graduates enjoy very good employment prospects (→ Figure 198): holders of PET qualifications as their highest qualification are more likely to find employment than holders of UAS or conventional university qualifications. Employability is influenced by several factors: the great effectiveness of PET qualifications, the stringent selection of PET qualification holders, the larger proportion of male students in PET programmes and the higher personal share of tuition fees (which serves as an incentive to remain in employment). However, it is difficult to determine the relative weights of each of these factors.

198 **Employment status by highest education qualification, 2007**

Data: FSO



1 It is important to consider the fact that UAS and conventional university students rarely benefit from time off from work (and hence continued payment of their salaries) for their studies. This is important because some analysts include missed salary (opportunity costs) and even the cost of living when calculating the cost of PET programmes. PET costs calculated in this manner are not then comparable with tertiary-level A costs, because these opportunity costs are not included in tertiary-level A cost calculations (even though they are also incurred).


Auftritts Kompetenz
Problemlösungsmethoden
Sender ⇔ Empfänger
Weltmeister
Lösung Konfliktsituation
Implizites explizit machen
KLP's
-Ausrichtung u Struktur als EF
-Gute Simulation von Praxis mittels FS
-Präsi-Struktur Hr. Zürcher
-Gewichtung Präsi-Bestandteile
PP's
CCP's
Modell als rF
Brückenbau
Engagement
Skript
Fazit: Leadership bewusster leben.

Continuing education and training (CET)

Context

Continuing education and training: a necessity for modern knowledge-based societies

Continuing education and training (CET) is mainly a phenomenon of highly developed knowledge-based societies. Rapid technological progress, globalised economies and international job markets require the steady upgrading and renewal of knowledge. Not only do people need to acquire new competencies, they also need to maintain them. It would seem that human capital, regardless of its initial education level, undergoes pronounced degradation over its lifecycle *(Falter, Pasche & Hertig, 2007; Weber, 2008; Janssen & Backes-Gellner, 2009)*. The challenge of acquiring, maintaining and upgrading competencies is felt at the individual, corporate and social level.

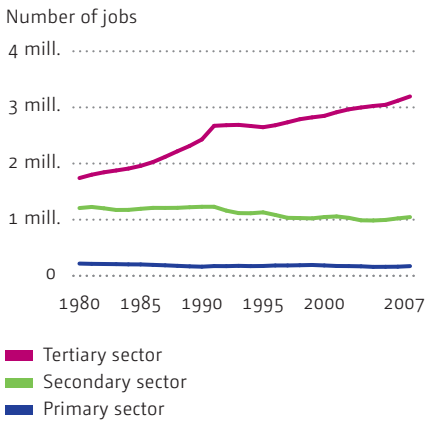
Demographic changes are also necessitating a relevant CET strategy for all individuals in the workforce. With half of all those in gainful employment being over the age of forty and the number of young people decreasing (→ *Chapter Context, page 37*), renewal and innovation within companies can no longer be based on staff turnover and recruitment on the job market. It is important for existing employees to undergo CET. A recent survey shows that two-thirds of Swiss companies feel that more CET for employees is the best means of facing the challenges of globalisation and demographic change *(Swissstaffing, 2009)*.

The restructuring of social and economic frameworks (→ Figure 199) has led to major growth in the services sector, which has changed companies and organisational structures and placed new demands on employee competencies. As knowledge becomes an increasingly important factor, the need for workers with tertiary-level qualifications has increased (→ *Chapter Tertiary-level education, page 171*).

The aim is also to improve the competencies of people who lack adequate basic skills such as reading and mathematics, since shortcomings in these areas will result in the sub-optimal use of the knowledge that is gained through experience as well. The latest international «Adult Literacy and Life Skills Survey» (ALL), which was conducted in 2003, concluded that one-sixth of the Swiss population had only minimum reading skills. This group is therefore ill-equipped to handle day-to-day social and work tasks *(Hertig & Notter, 2005)*.

To sum up, it can be said that CET is mainly intended to improve and upgrade existing competencies. Secondly, CET enables people to broaden and adapt their knowledge and skills to include new areas and tasks. Thirdly, CET is intended to allow people to catch up on education and training they missed out on. Depending on the structure of formal education and the economy, the size and extent of these three factors behind CET will vary from country to country.[1]

199 **Number of jobs per sector, 1980–2007**
Data: FSO

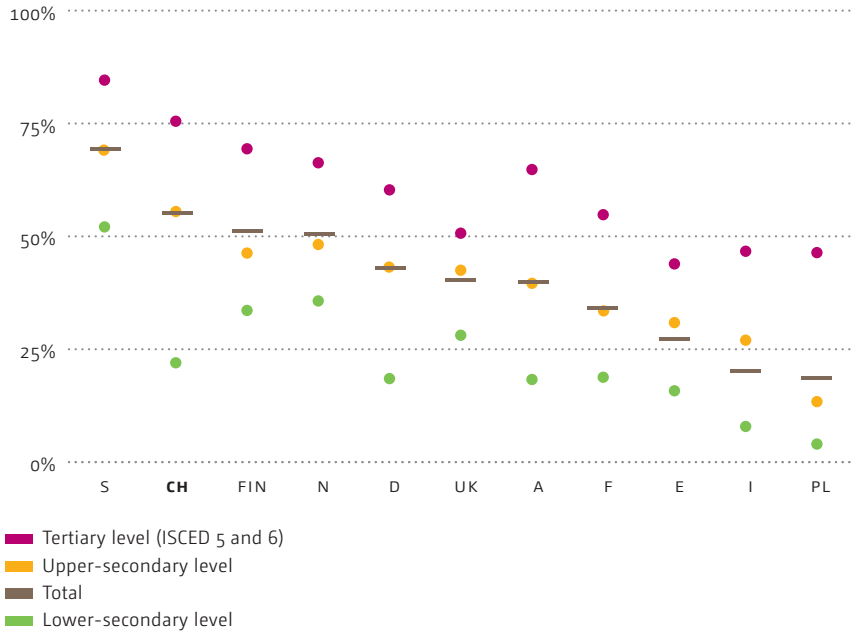


1 In education systems where there is a strong demand for adult education allowing individuals to catch up on education they have missed out on (e.g. in Scandinavian and English-speaking countries), adults are able to take post-compulsory qualifications with relative ease and without excessive cost. The result, however, is that graduation rates in these countries tend to be somewhat lower and dropout rates at upper-secondary level tend to be higher (see *Skans, 2007*). State funding of this type of adult education compensates for gaps in the formal education system.

200 **Participation in non-formal CET by education level, 2007**

Permanent resident population, 25–64 age group

Data: Eurostat, FSO



Non-formal CET: learning activities that take place within an established learning relationship, pursuing explicit learning objectives, but outside the formal education system.

CET systems develop dynamically and are subject to constant change. Over the past twenty-five years, Switzerland has developed an extensive, adaptable and functioning CET sector that is mainly structured along private-sector lines. CET courses geared to different segments are flexible enough to respond to social and economic developments *(Weber, 2001)*. The importance of CET for the economy is reflected in the high CET participation rates in Switzerland (→ Figure 200). An international comparison shows that most highly productive countries, with economies that have moved towards the services sector, have high CET participation rates.

CET takes place in different contexts

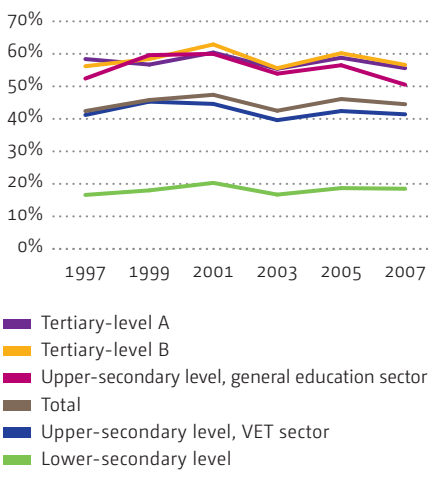
Different structures and general conditions partly explain the considerable differences in CET participation rates in the different countries *(Weber, 2001)*. Each CET system is strongly influenced by the corresponding education and employment system. The Swiss CET sector is thus highly segmented due to the various contexts in which CET takes place *(Weber & Tremel, 2009)*: the vocational education and training (VET) sector, the professional education and training (PET) sector, general education sector (e.g. adults catching up on their upper-secondary education, continuing education at university), infrastructure policy (e.g. CET courses for parents) and continuing education within companies (→ Table 202).

Within each individual context, the structure of CET courses would seem to be well-matched to the corresponding requirements, thus permitting relatively high participation rates on average. It is partly due to the nature of the CET system itself, however, that participation depends to a great extent on an individual's level of education (→ Figure 201). The differences and segmentation observed elsewhere in Switzerland's education system can also be found in the CET sector. Access to CET is mostly closed to indivi-

201 **Changes in participation in non-formal CET courses by education level, 1997–2007**

Employed persons, 25–64 age group, CET courses, excl. seminars and private courses

Data: FSO



202 **Overview of non-formal CET in Switzerland**

Information: *Weber & Tremel, 2009*

Context	Objective	Example	Regulator	Funding	Provider
VET/PET sector	Developing skills that complement or supplement skills gained from upper-secondary level VET programmes	CET courses by PET providers*, management courses	Confederation, cantons, trade associations	Demand-based: participants, employers, Confederation (SR 837.0)	Trade associations, private institutions
General education sector	Catching up on missed education, additional qualifications	Baccalaureate school for adults*, CET courses by PET providers*, universities	Confederation, EDK, cantons	Demand-based: participants, public subsidies (to provider or applicant)	Public institutions
Infrastructure policy	Addressing issues of public interest	CET courses for parents, CET courses on environmental issues, CET courses for migrants	Special legislation, Confederation, cantons, communes	Public subsidies, participants	Public and private institutions
Companies	Ensuring that company activities are reproduced and developed further	Company-specific CET courses	Company and/or labour legislation	Company	Company

* In the approach we have adopted, formal education leading to standard qualifications does not count as CET. Neither PET providers nor Baccalaureate schools for adults thus count as CET.

duals who lack at least upper-secondary level qualifications. This is probably one reason why unskilled workers, migrants and the unemployed pursue far less CET than better qualified workers (→ *Equity, page 265*)

On the concept of CET

Lying at the heart of the concept of lifelong learning, CET is a social and political imperative. Lifelong learning refers to all forms of learning that are intended to broaden knowledge and competencies over the course of one's life (see *European Commission, 2001; OECD, 2003*). The actual term «lifelong learning», however, mainly refers to a political programme. In order to describe the reality of CET, more precise definitions are needed. CET activities may be classified according to criteria such as objective, content or extent of institutionalisation. The latter is the most common approach and is recommended by UNESCO, the OECD and the EU. The FSO also uses this classification (see *UNESCO, 1997; OECD, 2003; European Commission, 2006a; FSO, 2006b*): formal learning takes place in organised, structured arrangements and leads to formal, certified qualifications. Formal learning includes all programmes that are part of the national education system (incl. adults catching up on their education).

Non-formal learning refers to organised learning activities that take place outside the formal education system. Non-formal learning activities do not lead to formal, i.e. nationally recognised, qualifications. Most CET activities such as courses, seminars, lessons, and private tuition, etc. come under the

non-formal category. Non-formal CET takes place either on or off working premises and is intended to complement formal education and training.

Informal learning includes all activities intended to convey knowledge and skills outside an organised learning setting and relationship. This learning takes place using learning materials and media, or through observation, or trial and error.

Moreover, learning activities may differ in terms of the learning objective: students may wish to learn for work, for general education, or merely for pleasure.

The effectiveness of political programmes for implementing lifelong learning is generally monitored on the basis of participation rates. There are also other indicators that may lend themselves to international comparison (→ Table 203). The corresponding participation rates depend on the type of learning taken into account (formal, non-formal, informal; VET/PET or general education), the population group considered (age, job-market status) and the observation period (see *FSO, 2006b*). Even though these indicators are relatively well-suited to gathering information about each type of learning, the results are still approximate, since we know nothing about the intensity, duration, intervals or quality of CET activities.

203 **Comparison of CET indicators**

Information: FSO, OECD

Indicator	Orientation	Type of education and training	Reference period	Reference population	Participation rate, Switzerland, 2003
SLFS (FSO): CET courses	General and job-related	Non-formal (only courses)	12 months	Resident population, 20–74 age group	36%
SLFS (FSO): CET courses	Job-related	Non-formal (only courses)	12 months	Working population, 20–74 age group	33%
SLFS (FSO): CET courses, informal learning	General and job-related	Informal (lectures, IT, instruction, observation)	12 months	Resident population, 20–74 age group	69%
Eurostat: all forms of education and learning	General and job-related	Formal, non-formal, informal	12 months	Resident population, 25–64 age group	65%
EU structural indicator: lifelong learning	General and job-related	Formal and non-formal (incl. seminars)	4 weeks	Resident population, 25–64 age group	29%
OECD: non-formal, job-related CET	Job-related	Non-formal (incl. seminars)	12 months	Persons capable of gainful employment or gainfully employed persons, 25–64 age group	41%
ALL (OECD): CET programmes and courses	General and job-related	Formal and non-formal (courses and seminars)	12 months	Resident population, 25–64 age group	60%
ALL (OECD): informal active CET	General and job-related	Informal (lectures, exercises, observation, counselling, media, IT)	12 months	Resident population, 25–64 age group	80%

Institutions

Article 64a of the new Federal Constitution now gives the Confederation authority to determine the basic principles of the CET sector and promote it. A new **Federal Act on Continuing Education** and Training is currently being prepared which is to establish the areas and criteria for the furtherance of CET.

The Cantons of Fribourg, Graubünden, Lucerne, Uri and Ticino all have their own **Cantonal Act on Continuing Education and Training**. Fourteen cantons have their own cantonal CET institutions, with nine of these providing public funding for their CET institutions. Eleven cantons provide demand-based public subsidies. CET courses are provided to individuals wishing to undergo training, to individuals with a disadvantaged educational background, to individuals lacking qualifications and to cantonal government employees.

The different structural conditions in which CET takes place (→ *Context, page 254*) are reflected in the complex legal status of CET institutions and also in the entities that run them: generally speaking, the cantons are responsible for non job-related CET, and the Confederation is responsible for job-related CET. Only five cantons have their own cantonal act on continuing education and training, however; some cantons place CET and adult education under cantonal legislation relating either to general education or more specifically to VET/PET. Other cantons have no legal provisions relating to CET at all *(IDES cantonal survey, www.edk.ch/dyn/13341.php)*. The vast majority of CET institutions are privately run and therefore funded by the demand side. The co-existence of state-run and privately-run, non-profit and profit-making institutions is a characteristic feature of Switzerland's CET sector *(Schläfli & Sgier, 2008)*.

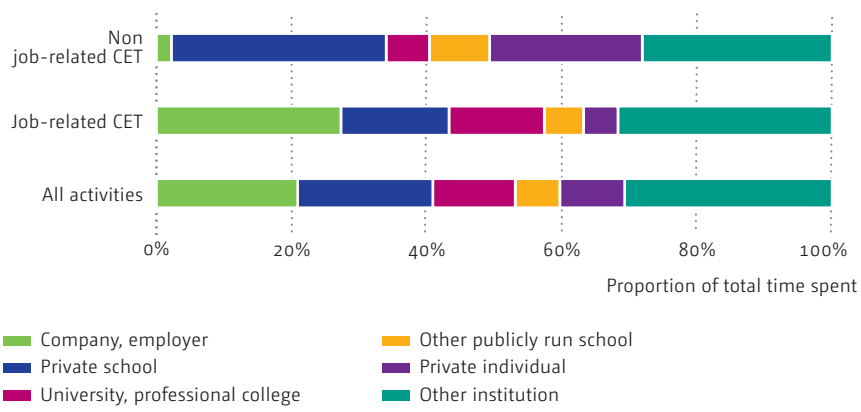
With CET programmes relating to Switzerland's VET/PET sector, companies play a significant role: they are responsible for over a quarter of all CET activities (→ Figure 204). Schools and universities account for a further third. Over half of all non job-related CET activities are handled by private providers (private individuals, other institutions). The increasing importance of formal CET and job-related CET activities has led to a shift in the entities running CET over the past few decades: smaller private providers have gradually given way to large private or public providers, particularly at tertiary level *(Schläfli & Sgier, 2008)*.

CET landscape

The different institutional situations can also be seen in a cantonal comparison of CET density, i.e. the ratio of CET providers to a given population (→ Figure 205). While a certain gap between urban and rural cantons is indeed plausible, the map also reveals differences between linguistic regions: cantons in the French, Italian and Romansh-speaking regions (i.e. primarily

204 **Providers of non-formal CET by purpose of participation**

Data: FSO



205 **Number of eduQua-certified CET providers per 100,000 inhabitants by canton, 2009**

Data: www.eduQua; map: Swisstopo

Number of eduQua-certified CET providers per 100,000 inhabitants

- 21 +
- 16–20
- 11–15
- 6–10
- 1–5

the western part of Switzerland and Ticino) tend to have a higher CET density in relation to their total populations than the German-speaking cantons.

Practically no market analyses of the CET situation have been conducted thus far. The CET sector is rather confusing, and there is a lack of data on CET providers. Even the list of eduQua-certified providers[2] does not give more than a rough approximation. The existing data do not therefore enable us to assess the true CET density, since we have no information regarding the size of CET providers.

According to experts, there is very little competition among CET providers. This is because each provider tries to carve out a niche market for itself so that it enjoys a near monopolistic situation; for this reason, the quality and price of CET are scarcely affected by competition *(Weber & Stämpfli, 2006, 2009)*.

2 This is Switzerland's quality label for CET institutions. Various cantons require eduQua certificates from CET providers wishing to qualify for public funding. The Swiss Conference of Cantonal Ministers of Education (EDK) recommends that cantons use the same criteria to assess education providers throughout Switzerland and that public funding be tied to eduQua certification. There are currently over 880 institutions throughout Switzerland that have the eduQua label.

CET themes

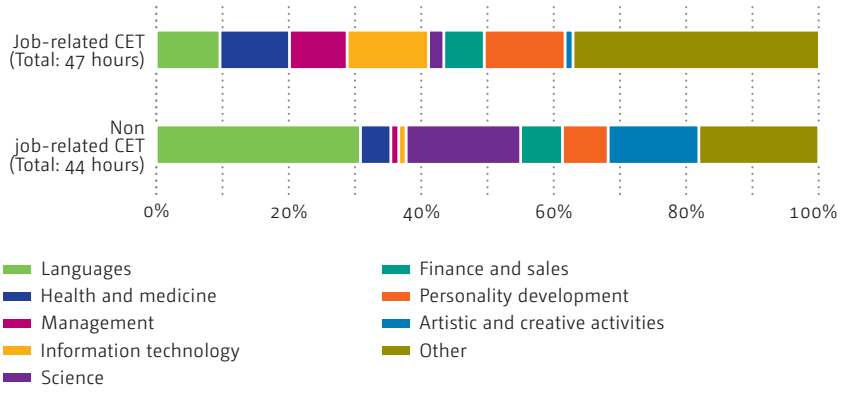
Among job-related, non-formal CET courses, over 40% relate to interdisciplinary themes such as management training, personality development, languages or IT. The remainder relate to a variety of job-related themes.

Among non job-related, non-formal CET courses, language learning is prominent, accounting for just under one-third of the time spent in such courses. Scientific subjects as well as artistic and creative activities are also very popular (→ Figure 206).

206 **Topics covered by non-formal CET courses, 2006**

Hours completed by employed persons, 25-64 age group

Data: FSO

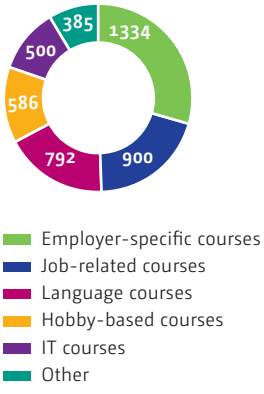


All in all, job-related CET courses constitute the largest group. Figure 207 shows the total costs of non-formal CET by course content. If we consider the fact that IT courses are mainly job-related and that language courses are also partly so, then we can conclude that at least two-thirds of all expenditure on CET is for job-related purposes. Hobby-based CET courses thus play a much less important role.

207 **Total expenditure on non formal CET, 2007**

Permanent resident population, age 20+, expenditure in CHF million

Data: FSO, calculations: University of Bern, Centre for Research in Economics of Education



Effectiveness

Setting objectives

In order to be able to determine the effectiveness of measures in the CET sector, explicit and verifiable objectives need to be established (e.g. participation rates, investment levels). In the CET sector, information from various political programmes, such as the EU's Lisbon Objectives *(→ infotext below)* is available. However, the objectives set out in these programmes are usually not concrete enough for use in an impact analysis.

In Switzerland, there is neither a comparable education policy programme nor concrete objectives. Corresponding discussions are only now taking place on a systematic basis for the first time within the framework of preparations for a new Federal Act on Continuing Education and Training (→ *Institutions, page 258*).

If the desired outcome of CET activities is to achieve Lisbon-like objectives, such as higher employment rates or greater competitiveness, then this already implicitly assumes a key impact hypothesis for CET which is exceedingly difficult to verify in empirical terms and which has so far not led to any conclusive findings.

Lisbon objectives and the Copenhagen Process

At a special meeting of the European Council held in Lisbon in the year 2000, the EU established the aim of becoming the most competitive and dynamic knowledge-based economy in the world by 2010. According to the Lisbon conclusions and the work programme adopted in Copenhagen two years later, this aim would be reached through extensive modernisation of European education and training systems. The following common objectives were set:

- ensuring an annual increase in per-capita contributions to human resources development
- improving the basic skills of EU citizens and the competencies of workers
- introducing and using new information and communication technologies in education
- promoting lifelong learning
- reducing the number of dropouts
- creating greater transparency in qualifications
- encouraging the mobility of students, trainees, teachers and workers

In order to simplify the modernisation process, the EU set two quantitative objectives on the occasion of an interim assessment: EU member states would devote 3% of their GDP to R&D activities by 2010, and employment rates would be increased to 70%. So far, no data have been produced to indicate whether these goals have been achieved.

Benefits of CET

From a theoretical standpoint, CET brings private monetary and non-monetary benefits to both individuals and employers, including greater productivity, higher salaries, greater competitiveness, improved employment prospects, greater job security, increased knowledge, personal fulfilment and emancipation. At the same time, CET brings benefits to society, such as growth, greater tax revenues, lower unemployment, generally improved competitiveness and the innovative capacity of the economy as a whole, greater political participation, and prevention of social risks and similar problems *(Balzer, 2001; Beicht, Krekel & Walden, 2006)*.

It is important to conduct empirical studies of the benefits of CET participation as well as the distribution of these benefits between employers and workers. The results of such studies determine how much public expenditure will be allocated to CET.

As far as job-related CET is concerned, several recent empirical studies show positive effects on both company productivity and worker salary *(Groot, 1995; Ballot, Fakhfakh & Taymaz, 2002; Jenkins, Vignoles, Wolf et al., 2003; Vignoles, Galindo-Rueda & Feinstein, 2004; Booth & Bryan, 2005; Conti, 2005; Kuckulenz, 2006)*. In these studies, the effects of CET on salaries were rather low and in some cases considered not to be significant *(Jürges*

& Schneider, 2004). Moreover, the studies show that the benefits of CET for less qualified workers tended to be felt by companies in the form of greater productivity rather than by the workers themselves in the form of higher salaries *(Kuckulenz, 2006)*. Findings differed from one study to another, but this was frequently due to the fact that the various studies used different methodologies to examine this complex issue.

In such studies, it is important to consider whether CET participation is endogenous. Many of the observed effects cannot be directly ascribed to CET activities. Other effects such as general skills and motivation lead to greater participation in CET courses. However, with or without CET, these skills would result in higher salaries regardless. This makes it difficult to determine whether the benefits of CET are actually the result of CET or whether they are merely the result of simple selection. As a consequence, it is difficult to generalise the effects of CET, since people will arguably be less inclined to enrol in a CET course if they are unable to derive a tangible benefit for themselves. It is also necessary to view in this same light the results of studies (see *Vignoles, Galindo-Rueda & Feinstein, 2004; Pfeifer, 2008*) where a positive impact on wages is found especially amongst participants receiving CET funding from their employers. Here it is reasonable to assume that employers chose the employees who would most likely benefit from employer-funded CET. In the case of self-funded CET, it is possible that employers are unaware of employee participation in CET courses and therefore do not increase employee salaries as a result. It is equally possible, however, that employers do not wish to reward employees for participation in self-funded CET because the worker's motivation is to find employment elsewhere. In such cases, the salary effect would only be felt when the worker effectively changed employers.

Employer-funded CET therefore depends on the supervisor's selection of eligible employees or employee self-selection. This selection is always based on an assessment of the individual benefits on both sides. Individuals make a rational decision as to whether or not to take part in CET, and employers make a rational decision as to whether or not to provide the necessary funding.

Nevertheless, such situations can have a negative impact on prosperity when less qualified workers do not enrol in CET courses because of a lack of personal benefit *(Wolter, Denzler, Evéquoz et al., 2003)* and when employers devote less CET funding to such workers because they see too few benefits in the current employment relationship. If the workers in question become unemployed later on, then it is society that will ultimately have to foot the bill. In such cases, it might have been more efficient for public funding for CET to have been provided at an earlier stage. For such cases, greater public-sector commitment would certainly be justified by the expected benefits to society (→ *Equity, page 265*).

Various assessments of job-market measures conducted within the framework of Switzerland's active job market policy provide concrete empirical findings on the benefit of CET (see *Ragni, 2007; Wolter, Denzler, Evéquoz et al., 2003*). However, in these assessments of job-market policy measures, it must be borne in mind that short-term effects, such as reintegration in gainful employment as well as the long-term development of human capital through courses, are rarely taken into account. It is thus seen that CET

has little, or even a negative impact in the short term in respect of rapid reintegration in the job process or the avoidance of long-term unemployment. Studies conducted in Switzerland (see *Marti & Osterwald, 2006*) found no significant impact of CET (IT, languages, basic programmes, etc.); other studies even found negative impacts in the sense that CET participation lengthened the period of unemployment and in some cases caused so-called lock-in effects[3] (see *Lalive d'Epinay, Zehnder & Zweimüller, 2006; Egger & Lenz, 2006*).

In the long-term (up to eight years), however, positive effects of CET can certainly be seen in the form of better employment prospects or higher income (see for Germany: *Lechner, Miquel & Wunsch, 2007; Lechner & Wunsch, 2006*). For Switzerland, corresponding long-term studies have not yet been conducted for reasons of data protection legislation *(Ragni, 2007)*.

Efficiency/Costs

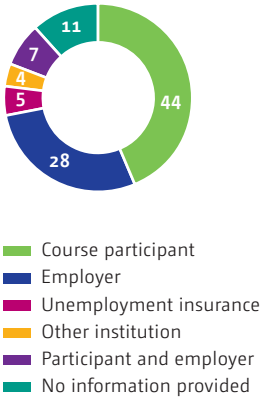
Total direct expenditure in Switzerland in non-formal CET stood at CHF 5.3 billion in 2007 (see *Messer & Wolter, 2009b*). This corresponds to 1% of GDP. More than 40% of this expenditure was paid by CET students themselves and just under a third by companies (→ Figure 208). In Germany, CET students shouldered an even larger burden of costs: in 2002, average costs for job-related CET stood at EUR 700, two-thirds of which were paid by CET students and just under one-third by other sources (employers, public subsidies, etc.) (see *Beicht, Krekel & Walden, 2006*).

Total costs for CET take the form of direct costs (tuition fees, equipment, documents, expenses, etc.) and indirect costs (mainly loss of income). Potential CET students will also weigh other costs such as lost leisure or holiday time, mental strain (greater workload, family burden, stress and study load) against the potential benefits. Based on the FSO's Swiss Labour Force Survey (SLFS), an average of 52 hours were devoted to non-formal CET in Switzerland in 2006. Relatively large variances and differences were observed between the various groups of CET students (→ Figure 209).

Employees today pay somewhat more of the costs than they did twelve years ago; the share of CET paid entirely by employers has declined somewhat. That having been said, mixed funding agreements, where the burden of funding and time is shared by both employers and employees, have become more common: back in 1996, just under 14% of CET students received either time off from work or funding from their employers; in 2006, the proportion had risen to 22% (see *Messer & Wolter, 2009b*). In most cases of mixed funding, employers pay the direct costs and employees put in the time.

208 **Source of funding for non-formal CET, in per cent, 2007**

Permanent resident population, age 20+
Data: FSO, calculations: University of Bern, Centre for Research in Economics of Education

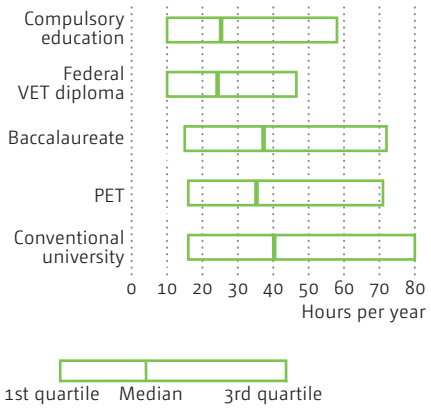


3 While taking part in CET, there is less of an incentive to find a job. This effectively keeps the individual unemployed (lock-in effect).

209 **Time devoted to non-formal CET by education level, 2006**

Data: FSO

Example: the middle 50% of all holders of university qualifications devote between 16 and 80 hours per year to non-formal CET.



Cost-benefit considerations

The efficiency of CET expenditure can also be assessed on the basis of a subjective estimate of the cost-benefit ratio. Surveys of CET students in Germany have shown that the personal benefits to CET students in terms of better employment prospects, higher salaries or greater job security were often not felt to the extent that they had anticipated *(Beicht, Krekel & Walden, 2006)*. The subjective assessment of cost-benefit ratio depends on socio-demographic characteristics but also on such things as the amount of time and money devoted to CET. The studies also show that the effects were consistently more positive for women, younger students, more highly qualified workers and those in gainful employment. While the vast majority of respondents felt that the benefits of CET were at least as high as, or higher than the costs, 10% felt that the cost exceeded the benefits.

This finding has been corroborated by other studies that show that the decision to attend CET courses is a rational one (although it cannot be excluded that the surveyed decision may have been rationalised after the fact). Only students who see a net benefit will be willing to take part in CET. On the whole, it can be said that CET participation is efficient *(Brunello & De Paola, 2009)*.

Nevertheless, inefficiencies may occur for various reasons. They may be the result of positive external effects of CET (i.e. where benefits to society are very high but benefits to individuals are relatively low). Such situations may lead to suboptimal CET participation, since individuals will not be willing to pay for something that does not bring direct personal benefits. This can happen relatively frequently in cases where an individual's decision not to take part in CET will generate a social cost, i.e. costs not borne by individuals who do not pursue CET. Inaccurate estimates of the (long-term) benefits of CET may create problems when individuals who could have derived a long-term benefit choose not to take part in CET. Surveys conducted to determine the reasons for not attending CET courses show that the individuals in question tended to underestimate the potential increase in salary and greater job security that could have been gained *(Backes-Gellner, Mure & Tuor, 2007; Pfeifer, 2008)*. Such behaviour is often found among unqualified workers whose activities are less affected by technological change. The individual therefore feels less inclined to continue learning. In the long term, however, it is precisely these unqualified jobs that run the risk of being phased out under the effects of structural change. Unqualified workers can only increase their employment prospects by taking part in CET *(Backes-Gellner, Mure & Tuor, 2007)*.

If CET participation rates are indeed suboptimal among less qualified workers, this prompts the question as to how these rates can be increased in an efficient manner. Incentives such as education vouchers for this target group have shown a certain impact (see *Messer & Wolter, 2009a*). However, other incentives still need to be found to encourage substantially greater CET participation among the members of this target group (see also *Oosterbeek & Patrinos, 2009; Expertenkommission Finanzierung Lebenslanges Lernen, 2002*).

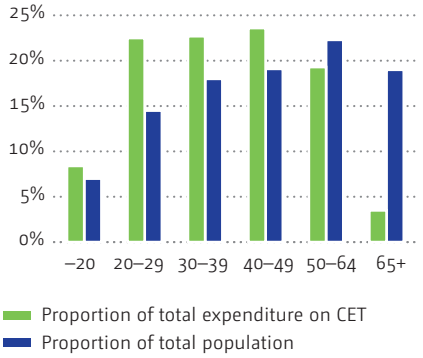
Equity

Distribution of CET among age groups

Unlike other sectors of the education system, CET is characterised by certain contrasts between efficiency and equity. Unequal CET participation among different age groups can be explained from the standpoint of human capital theory. The older the student, the fewer benefits can be derived from investment in education: older students have less time to derive benefits from investment in education. This means that cost-benefit ratios continuously decline with age.[4] Moreover, education is a dynamic and cumulative process whereby skills acquired today will facilitate learning tomorrow. In other words, early investment in education reduces the costs of later investments and, when viewed over an entire lifecycle, works out to be more efficient than later investments (see *Cunha, Heckman, Lochner et al., 2006*). The empirically proven observation that education expenditure decreases with age is therefore not necessarily a violation of the equity principle. It may merely be the consequence of a rational decision on the part of workers (→ Figure 210).

210 **Expenditure on CET by age group, 2006**

Data: FSO, calculations: University of Bern, Centre for Research in Economics of Education



Unequal CET participation by education level and income

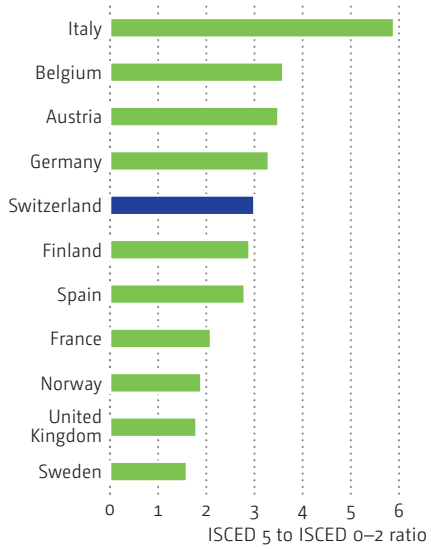
The expected benefits of CET activities depend to a large extent on the education level of CET students. Both workers and employers stand to gain from additional competencies (see *Wössmann, 2008a, 2008b*). Moreover, the relative costs for less educated individuals are likely to be higher due to the lower financial resources available and the greater mental strain. Both of these factors widen the gap in CET between those who have a high education level and those who do not: more highly qualified workers tend to be more suited to take part in CET activities, since they have more competencies and thus have even better employment prospects (possibility of promotion, higher income, etc.); in contrast, less qualified workers benefit less from CET activities and are less likely to take part, thereby reducing their chances of earning more and being at greater risk of becoming unemployed. Instead of balancing out social disparities, CET reinforces social inequities between low and highly qualified workers.

Compared to other countries, Switzerland shows major differences in CET participation between higher and less qualified workers (→ Figure 211): holders of tertiary-level qualifications are three times more likely to benefit from CET than holders of only compulsory education qualifications. The large disparity in participation exists only at the lowest education level. If we compare holders of tertiary-level qualifications (ISCED 5A or 5B) with holders of upper-secondary level qualifications (ISCED 3A or 3B), we find that the situation is quite different: the gap between these two categories is no longer

211 **International comparison of participation disparities in non-formal CET, Part I, 2007**

Participation of holders of tertiary-level qualifications (ISCED 5) and holders of compulsory education qualifications (ISCED 0–2) in non-formal CET

Data: FSO, Eurostat

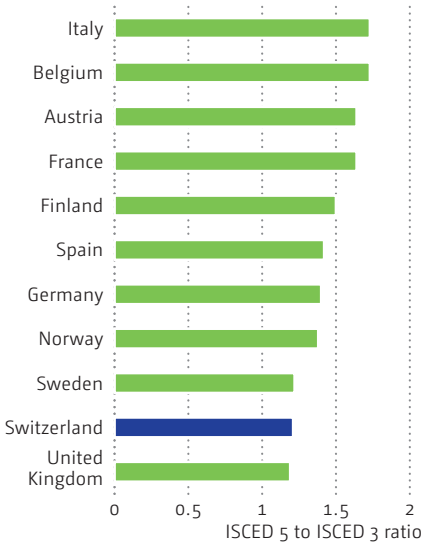


4 On the one hand, it is reasonable to expect that as people get older, they are more likely to focus on unemployment insurance aspects. CET increases one's employability and offers a certain degree of protection against unemployment. On the other hand workers are already covered by unemployment insurance, the incentive to spend one's own money on CET decreases with age.

212 **International comparison of participation disparities in non-formal CET, Part II, 2007**

Participation of holders of tertiary-level qualifications (ISCED 5) and holders of upper-secondary level qualifications (ISCED 3) in non-formal CET

Data: FSO, Eurostat



Example for Figure 211 and Figure 212

In Switzerland, holders of tertiary-level qualifications are three times more likely to attend non-formal CET courses than holders of only compulsory education qualifications. The participation disparity practically disappears if we compare holders of tertiary-level qualifications to holders of upper-secondary level qualifications (e.g. Federal VET Diploma).

Example for Figure 213

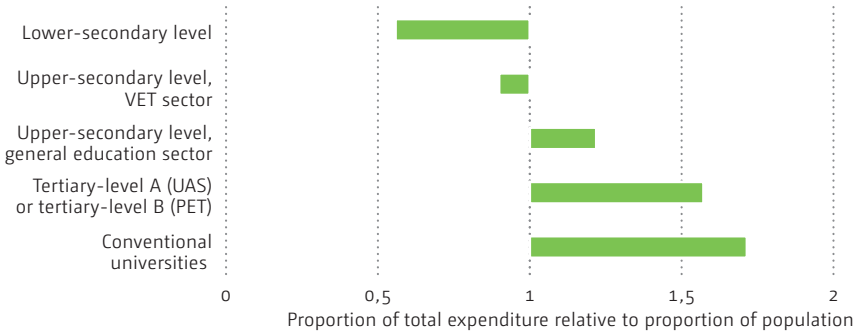
Holders of UAS degrees spend one and a half times as much on non-formal CET courses than the proportion they account for in the corresponding education stratum.

as wide (only a factor of 1.2). And compared to other countries, Switzerland ranks very well in terms of equity for these two groups (→ Figure 212). Finally, if we exclude the lowest education level, CET participation is high in Switzerland (→ Figures 200 and 201, → *Context, page 254*).

Larger disparities exist between education and income levels when it comes to non-formal CET expenditure: if we consider the proportion of university-educated persons within the total population, we find that they spend above average on non-formal CET, while those who have only been through compulsory education spend less than average (→ Figure 213). If we consider income level, the disparities become even clearer: the highest income group spends twice as much on non-formal CET as would be expected given the size of this group within the total population (→ Figure 214). This shows that education level and financial resources are decisive factors in the decision to enrol in CET courses (see *Messer & Wolter, 2009a*)

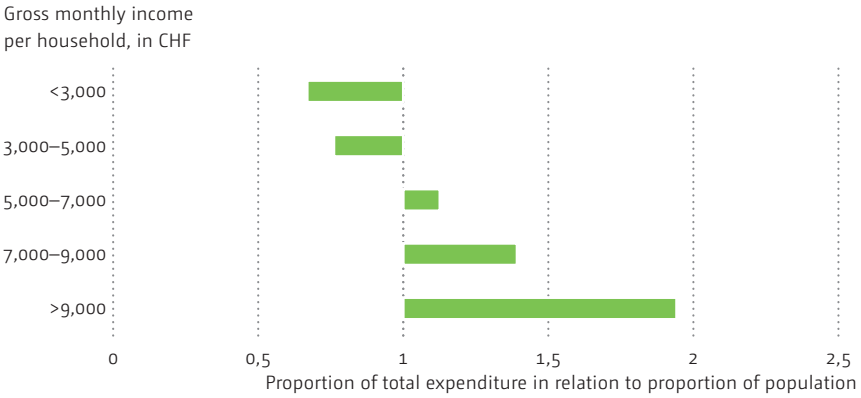
213 **Relative expenditure on non-formal CET by education level, 2006**

Data: FSO, calculations: University of Bern, Centre for Research in Economics of Education



214 **Relative expenditure on non-formal CET by income bracket, 2006**

Data: FSO, calculations: University of Bern, Centre for Research in Economics of Education



Unequal funding for CET by gender

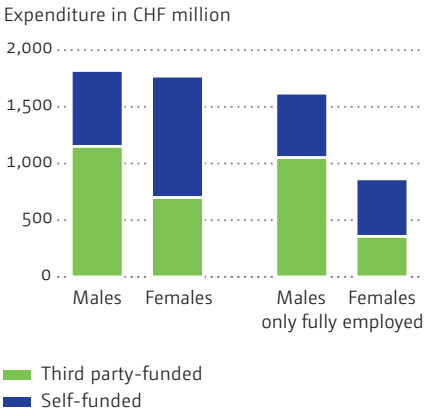
CET participation rates for women tend to be slightly higher than for men *(FSO, 2006b)*. Nevertheless, working women pay 60% of the costs of CET out of their own pocket while men only end up having to pay about one-

third of the costs (→ Figure 215: first two columns). And if we only consider full-time workers, we find that women still pay considerably more for CET (59%) than men (35%) (→ Figure 215: third and fourth columns).

If women were to base their decision to take part in CET on employer willingness to pay for CET, then their CET participation rate would be considerably lower than for men. Women compensate for this unequal treatment by employers (i.e. lesser willingness to fund CET) by paying CET costs themselves. The gender comparison among full-time workers shows that the unequal treatment of women in this respect is not really based on objective criteria and must therefore constitute discrimination and a violation of the equity principle.

215 **Total expenditure on CET by gender, employment status and funding, 2007**

Data: FSO, calculations: University of Bern, Centre for Research in Economics of Education



Cumulative effects

Introduction

The studies presented here for the purpose of analysing the **effects of education** measure education differently. Some studies consider the number of school years, while others focus on the qualifications obtained. In the latter case, outcomes achieved by holders of upper-secondary level qualifications are compared with the outcomes achieved by holders of university qualifications. Some studies go one step further, drawing distinctions within a specific education level (e.g. between the general education and VET sectors at upper-secondary level). Other studies even consider the quality of a given educational path.

This chapter examines the cumulative benefits (or outcomes) that education provides. The term «outcomes» is used when one deals with the effects that education has on specific aspects such as income, health or happiness. In other words, this chapter does not deal with the acquisition of education or skills per se, but rather with the impact that they have on the individual.

The word «cumulative» may be understood in two distinct ways. First of all, cumulative in the sense of the combined knowledge and skills that lead to given outcomes. In other words, unlike the previous chapters devoted to specific levels of education, this chapter sets out to measure the overall impact that education has on outcomes and not merely the impact of education received at a specific education level. Analysing the cumulative effects of education is a worthwhile and frequently unavoidable endeavour because it is impossible to isolate the specific impact that knowledge and skills acquired at an individual education level have on given outcomes.

Secondly (and more of an unintended interpretation), «cumulative» can be understood in the sense of the combination of education and a range of other influencing factors. Often the precise impact of education on its own is difficult to determine, because individuals enrolled in different types of education also differ in many other respects. It is frequently impossible to distinguish between the impact of these characteristics and the impact of education.

When examining impacts, a distinction is drawn between impacts that affect the individual who receives the education and impacts that affect society, regardless of the person receiving the education. This chapter has therefore been subdivided into two main sub-chapters. The first covers the benefits of education for the individual, while the second covers the benefits of education for society. In both cases, economic and social outcomes are considered. The first category can be expressed in monetary terms. The second category, which can also be expressed in monetary terms, mainly leads to benefits of a non-monetary nature.

Private benefits of education

The private benefits of education may be understood in terms of improvements to an individual's wellbeing. Education endeavours may therefore be viewed as a personal investment intended to improve the life of the person concerned.

Employment

The economic return on education in the form of paid employment may not be the most important benefit of education but, since gainful employment forms the basis for a large number of other returns, it doubtless constitutes

the central element for assessing the economic benefit of education for an individual. Education improves a person's employment prospects in two specific ways: first of all, education increases the likelihood that a person will indeed become economically active (→ Figure 216). Secondly, it reduces the likelihood that a person will become unemployed for reasons beyond their control (→ Figure 217).

The likelihood of an individual being gainfully employed is influenced positively through their level of education, from the viewpoint of both the potentially employed individual themselves and their potential employers.

One possible explanation for the likelihood of being in gainful employment depending on the level of education is that individuals who have a relatively low level of education may not wish to work, since their potential wage does not make work an attractive proposition. The intensity of this effect, which has been scientifically proven, depends inter alia on a country's social security system, since this indirectly sets the income threshold below which it is not worthwhile to work.

A second contributory factor is that individuals with a low education level are more likely to become unemployed, i.e. to not be in gainful employment, against their wishes. The greater likelihood of being unemployed as a result of educational level is due, firstly, to the changed requirement for qualifications in the wake of technological advances in industrialised societies. Technology and competencies complement each other and are mutually dependent on one another (see *Goldin & Katz, 1998*, → *Chapter Context, page 37*). In other words, as technological advances accelerate and become more embedded within an economy, the need for greater competencies increases. In addition, companies that need to lay off workers will usually start with those who have the lowest level of education, since the companies will have invested least in their training. Company expenditure on continuing education and training (CET) serves to complement an individual's formal education and training (→ *Chapter Continuing education and training (CET), page 253*).

This means that companies promise themselves a higher return on their investment in CET if it is channelled to those who are already highly qualified. Hence, greater costs will be at stake if a company lays off an employee with high formal qualifications rather than an employee with lower qualifications. There is also a risk that the decision to lay off an employee was wrong, in which case a new employee would need to be recruited to replace the one who had just been laid off. Here again, highly qualified employees cost more to recruit than lesser qualified ones, because they are not as easy to find. When the company's order book declines, it therefore makes more sense to hold on to highly qualified employees and let go of the lesser qualified ones to tide things over (see also *Groot & Oosterbeek, 1992*).

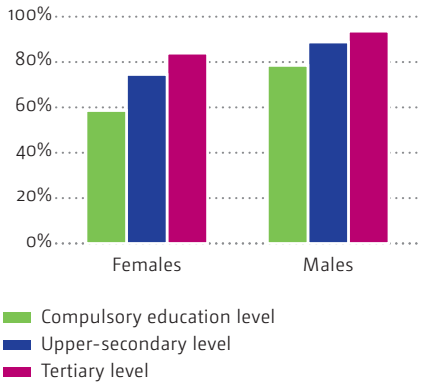
Thirdly, companies undertake more intensive searches for highly qualified workers, since failing to fill high added-value positions can prove more costly than leaving low added-value positions vacant. In other words, highly qualified workers who are currently unemployed will remain unemployed for a shorter time on average than less qualified workers.

Fourthly, highly qualified workers are shielded from long periods of unemployment because they can also carry out activities that require a lower level of qualifications, while this is not the case the other way round. However, even highly qualified workers may find it difficult to find employment at times, since with a higher level of education their specialisation also in-

216 **Employment rates by education level, 2007**

Data: FSO

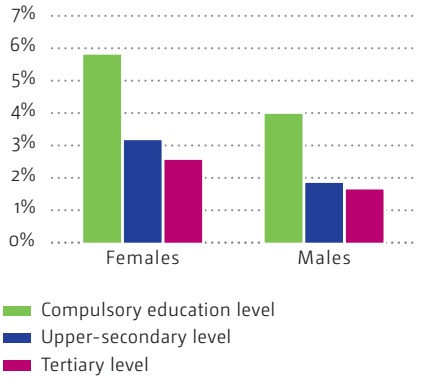
Fewer than 60% of females holding only a compulsory education qualification are in employment, compared to around 80% of females holding a tertiary-level qualification. This education-based differential is smaller for males.



217 **Unemployment rates by education level, 2007**

Data: FSO

The unemployment rate among individuals with a low education level in Switzerland is generally over twice the unemployment rate among highly qualified individuals. This difference is also independent of the economic climate.



creases and the number of available jobs in their field of expertise falls. If they are not prepared to take up less qualified work (on account of the lower wages), then it can happen that highly educated individuals take longer to find a job (see e.g. *Kettunen, 1997*).

Fifthly, national economies are competing with one another for jobs and, in the light of this competitive situation, highly qualified individuals are better protected against the outsourcing of jobs abroad than more poorly-qualified workers. In other words, the reduction in headcount in favour of international outsourcing will affect highly qualified workers less severely and often at a much later stage than those with fewer qualifications.

Coupled with empirical data in this regard, all the above reasons indicate that the level of formal education achieved by an individual has a positive influence on the likelihood that he/she will be gainfully employed at all and able to live in a self-determined manner on income earned.

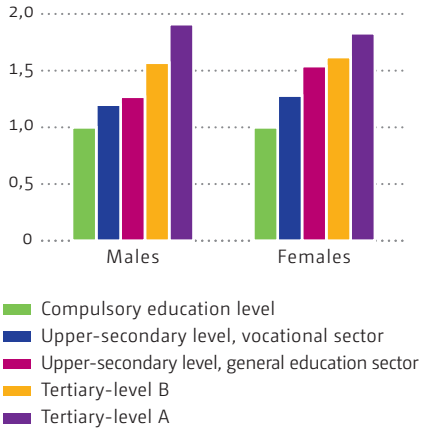
Private returns on education

218 **Relative earned income by education level, 2008**

Data: FSO

Index 1 = compulsory education only

In Switzerland, individuals with a university qualification earn around 90% more than those who obtained no further qualifications after completing compulsory education.



Higher educational qualifications not only increase the likelihood of an individual working at all but also increase the amount of income that he/she is able to generate. The impressive wage differentials (→ Figure 218) that result from education are partly explained by the fact that individuals with higher levels of educational attainment are also more productive. At the same time, these wage differentials are due to the fact that the more productive jobs (such as those that require the use of technological equipment) are more often given to highly qualified individuals.

It is not, however, sufficient to observe the average wage differentials between individuals with different levels of education to establish the cost-effectiveness of investment in education. There are at least two reasons why these differentials do not provide sufficient information.

For one thing, wage levels are also determined by the skills developed on the job. Individuals of the same age may have been in education for different periods of time and therefore also active on the labour market for a different period of time, and hence the wage differential at a given age cannot only, or entirely, be attributed to the difference in formal education. Empirical calculations have shown that, in real terms, the productivity gains resulting from accumulated experience enable workers to increase their salary by 1–2% per year of employment (for an overview of the empirical literature published in Switzerland on this particular topic, see *Weber & Wolter, 1999*). This means that the income earned by a thirty-year-old employee is partly derived from his/her education level and partly derived from the on-the-job skills developed over the course of his/her career. For an individual who leaves the school system after completing just compulsory education, this second component will form a much larger part of his/her income than would be the case for an individual of the same age who graduated from a university at the age of 25. Mincerian wage regressions (named after the American economist, Jacob Mincer, *Mincer, 1974*) were used to calculate the return on education investment, taking into account both the wage benefits derived from formal education as well as the wage benefits derived from work experience and company loyalty (tenure). This, in turn, enabled us to isolate the impact of «just» formal education on wage differentials. Figure 219 shows the ben-

219 **Private return in the form of additional income per year of education, 2007**

Data: FSO; calculations: SCCRE

Reference group: compulsory education

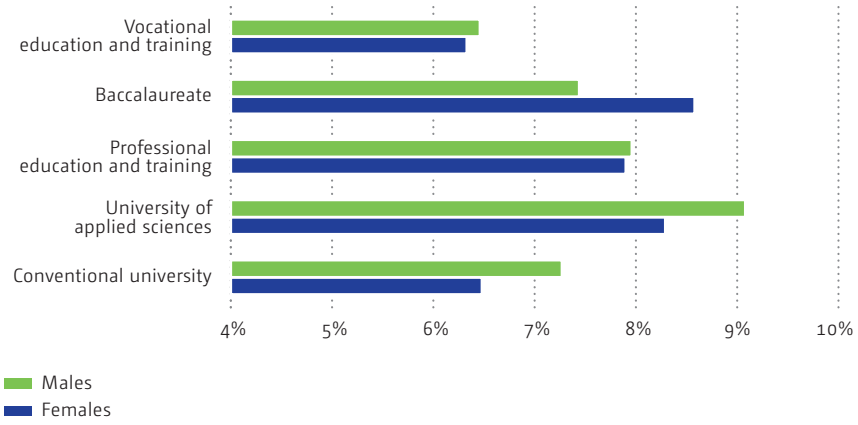


Figure 219 shows the percentage increase in income that individuals with additional educational levels can expect to earn. In Switzerland, the private return on education is between 6% and 9% for each additional year spent in education. This means that a female who has completed an upper-secondary level VET programme would earn around 20% more (average duration of a VET programme in years x 6.2%) than a female who did not obtain any further qualifications after completing compulsory education. A female with a university qualification will earn around 50% more (an average of eight years of education x 6.5%) than a woman who has not obtained any further qualifications after completing compulsory education.

efits derived from formal education that were calculated using the Mincer model. The data for these calculations were obtained from the Swiss Labour Force Survey (SLFS) in 2007.

Secondly, if education is to be regarded as an investment decision, it is important to consider the fact that such an investment will entail certain costs before the higher income can be generated. These costs are of two types. First of all, there is the direct cost of the education itself in the form of semester tuition fees charged by universities, plus the cost of study materials, and examination fees, etc. Since these costs are subsidised to a large extent in Switzerland, they are not a decisive factor.[1] Secondly, prospective students need to consider lost income (opportunity costs) during the time spent undergoing education. Here the decisive factor is not just whether or not the higher education level will lead to a higher income than if one had remained at the lower education level; the prospective student also needs to decide whether the higher income will be enough to compensate for the years devoted to education where no income was earned at all. If the returns on education are calculated with allowance for the direct costs of education and the opportunity costs, employing the «cost-benefit model», then the long duration of education at tertiary level, in particular, (especially at universities) leads to relatively low returns *(Wolter & Weber, 2005)*. For women, the gain in income from each year spent studying at university can be as low as 2%.

Regardless of the method used for such calculations, it is clear that formal education pays dividends in terms of higher income. This matches predictions based on human capital theory, which holds that investment in education reaps benefits later on in the form of increased productivity and hence higher salaries. An alternative explanation, however, would be that wage differentials are the result of the selection process within the education system itself. More gifted individuals will tend to remain in education for longer and

1 The significance of the direct costs of education become clear, for example, if we examine the situation of someone who is faced with a decision regarding whether to attend an elite university that is charging fees of CHF 25,000 per semester, or whether to obtain his/her degree at a state-run university charging fees of one-fifth of that amount.

less-gifted individuals will not obtain higher level qualifications, and hence the mere fact that an individual has obtained a qualification is a sign that he/she is truly gifted and is therefore likely to be a productive employee (see *Spence, 1973*). It thus follows that employers will be more willing to pay a higher salary to holders of higher formal qualifications, regardless of whether the knowledge gained at school and university is relevant to them or not. While it will probably be of no consequence to an individual earning a high salary to know why he/she is earning a higher salary, making this particular distinction is essential in any attempt to assess the role played by the education system. In the first instance (the human capital theory), the central role of the education system would be to transfer knowledge and skills. In the second instance, the central role of the education system would be to sort out the gifted and less gifted individuals (ability grouping used to provide a signal to the job market). Research findings on this issue have thus far been inconclusive. Based on current research, it would seem that the education system plays both roles simultaneously.

It has been observed that individuals become more competent the longer they stay in school. It has also been observed that more gifted individuals tend to stay in education for a longer period regardless of the education received and are thus more likely to attain higher qualifications. These two observations shed light on an additional and more crucial problem when it comes to assessing returns on education. While more gifted individuals tend to hold higher qualifications, it is unclear whether they earn higher income because of their higher qualifications or because they are more gifted. As long as we are unable to distinguish between these two possible explanations, both the State and individuals wishing to obtain an education will find it difficult to assess the possible returns on education. While education certainly brings numerous benefits, individuals should not automatically assume that they too will be able to increase their income to the same level if they do not truly possess the decisive skills. On the other hand, even if they happen to possess skills that are highly valued on the job market, they can achieve that same level of income without making the «detour» that would result from pursuing prolonged education or training. The State, i.e. the education policymakers, does not know whether the benefits of education are indications of the effectiveness of the education system (which would be the case if the benefits had resulted from the skills acquired during education and training), or whether the benefits of education have less to do with the effectiveness of the education system and more to do with the process of self-selection of more gifted individuals.

These important factors explain why, for more than 40 years now, despite sophisticated statistical methods and investigative approaches, researchers have been unable to produce conclusive findings as to the true returns on education. If we attempt to summarise the current state of knowledge, we may state that up to 50% of the benefits that have been observed to result from education are actually not the result of education at all, but rather the result of the selection of those admitted to education. In other words, the individuals concerned would have earned a higher income regardless of whether or not they had received an education.

Health and life expectancy

One of the most important potential non-monetary benefits that a person can expect to gain from education is health.[2] A large number of empirical observations have shown positive statistical correlations between a person's education level and the health that he/she enjoys, lending credence and support to this assertion. The positive correlation between education and health has been demonstrated in various studies in a number of different countries over different periods of time (see e.g. *Cutler & Lleras-Muney, 2008*). Those who have received a better education live longer (→ Figure 220), are less frequently ill and provide a more upbeat assessment of their own health (to gain a more complete picture, see also *Grossman & Kaestner, 1997*).

There are a number of different channels through which education exerts a positive influence over the health and health behaviour of men and women:

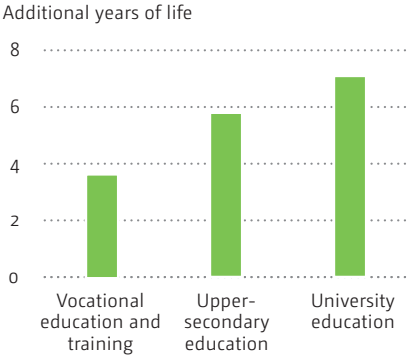
- Educated people are more likely to have gained an understanding (such as an awareness of the consequences of behaviour that is detrimental to our health) and an ability to make decisions (e.g. desisting from unhealthy behaviours such as smoking) that will have a positive influence on their health.
- Educated people are better at remaining healthy (cf. *Grossman, 1972*). They actually have a greater awareness of when it is necessary to take preventative measures.
- Education increases the opportunity costs of illness. Whenever educated people become ill, their better lifestyle, higher income and other factors are placed in jeopardy. This, in turn, increases their incentive to reduce or avoid behaviour that is detrimental to their health.

It has been argued, quite logically, that the relationship between education and health is only an indirect one (see e.g. *Mirowsky & Ross, 2003*). Indirect correlations such as these may actually arise as a result of an individual's income or employment. For one thing, if a higher education level generates a higher level of income and if, at the same time, a higher level of health mainly depends on a person's ability to purchase services that will improve his/her health, then the positive correlation between education and health is an indirect one. Likewise, indirect correlations may also arise as a result of an individual's place of work where physical or mental stress is lower. Jobs in such workplaces are mainly given to people who have been educated to a higher level.

220 **Additional life expectancy by education level – males**

Data: *Spoerri, Zwahlen, Egger et al., 2006*

A study into the relationship between life expectancy and education in the German-speaking region shows the following: A thirty-year-old man with a university qualification will live around 7.1 years longer than a man who has completed only compulsory education or lower. In other words, the university graduate will have a 16% higher life expectancy.



2 Of course health is also a monetary benefit, in the sense that illness costs money that would otherwise be saved if the person remains healthy. This correlation with health costs also shows that the better health derived from a better education not only has benefits for individuals, but also for society, especially when part of the health care costs have to be borne by public funding. Individuals who pursue an education therefore provide a benefit to society by not incurring health care costs.

Income levels and health

As it is almost impossible to examine the influences of income and education on health in isolation, a Swedish researcher (see *Lindahl, 2005*) used lottery winners as a type of natural experiment. When an individual wins a substantial amount on the lottery, his/her income changes as a result of external factors and not as a result of his/her education level. Lindahl was therefore able to examine whether positive changes to income also have a positive impact on health, similar to the positive effects that have been observed as a result of wage differentials between people with different levels of educational attainment. The research showed that individuals who won money in this way without changing their education level significantly improved their health. Lindahl concluded that a permanent 10% increase in income raised a person's life expectancy by 5 to 8 weeks, when compared to someone with a similar education level. This points to a clear and direct causal link between income and health, to the extent where a major portion of the health differential between different education levels is due to the income differentials resulting from the education received. There would not then have to be a direct link between education and health in order to explain the positive correlation between the two parameters.

The question as to whether education exerts a direct or indirect influence on health is particularly important in political circles. If education increases our income, and income improves our health, then a more focused and more efficient measure in the short-term (apart from other effects) would be to subsidise low-income households, rather than to invest in their education.

Inverse causal link: It has also been observed that inherited, genetically-caused or other illnesses that occur during childhood may hinder one's future educational path. Sick children are more frequently absent from classes and therefore find it more difficult to keep up with other students. This effectively reduces their chances of educational success (see e.g. *Case, Fertig & Paxson, 2005,* or *Ding, Lehrer & Rosenquist, 2006*). Circumstances such as these will also give rise to a statistically measurable correlation between education and health, the only difference being that, in this case, the causal link applies in the opposite direction.

Though the statistical correlations and possible explanations for such correlations seem highly convincing, the causal link between increased education and better health is still a long way from being proved. Indeed, it is possible that such a causal link does not exist or is much weaker than measured in the correlations, as a number of theoretical reasons and empirical observations would lead us to assume.

Experimental configurations designed to allow us to examine the causal relationship between education and health used educational reforms which involved an increase in the number of years of compulsory education. Reforms of this type can be regarded as natural experiments, since, viewed from a short-term perspective, they only change the length of schooling, and hence any change in the health of those who have remained in education longer can be attributed to education. Thus far, however, analyses of this type have delivered contradictory results: *Lleras-Muney (2005)* and *Arendt (2008)* found a positive correlation between health and the duration of education while *Clark and Royer (2008)* and *Arendt (2005)* observed no correlation whatsoever.

Researchers seeking to ascertain the «true» return on education and causal links between education and health have considered the situation of identical twins. Any differences in health between two genetically identical individuals with the same social background could be explained by differences in their education. When carrying out an experiment of this type, *Lundborg (2008)* identified a causal relationship between education and health. As with the returns on education, however, these findings for twins should not be taken as the definitive truth, since research using sets of twins

is itself affected by a number of major problems (see e.g. *Bound & Solon, 1999,* or *Neumark, 1999*).

To conclude, there is indeed a positive statistical correlation between a person's education level and the health enjoyed by that person. However, thus far there have been no unequivocal answers as to whether this correlation is causal in nature, and if so, in which direction. We can nevertheless assume that a substantial part of that correlation is direct and the remainder indirect (e.g. via the income generated by the individual concerned) (see also *OECD, 2006a*). Since there are insufficient scientifically anchored findings on the precise nature of these correlations, we are unable to perform a cost-benefit analysis of the impact of education investment on health yields. In many cases, however, this would be a prerequisite for determining the suitability of education policy measures.

Self-contentment and happiness

If, in addition to physical and mental health, we also consider happiness[3] as a potential benefit of education, we find the same theoretically possible correlations and practical problems in measuring it as mentioned earlier.

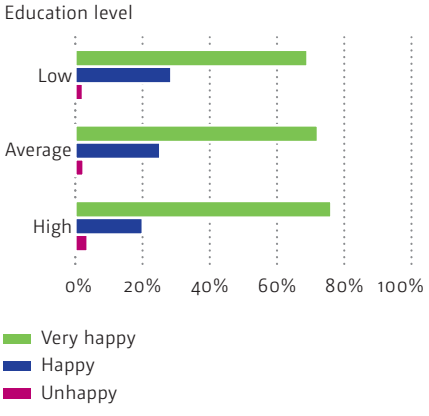
Theoretically speaking, education is capable of having both a direct positive effect on our subjective feelings of happiness as well as a direct negative effect. First of all, the knowledge acquired through education may in itself be regarded as a benefit (just like any normal asset) and therefore enhance our feelings of self-contentment. Secondly, education can improve our ability to reflect on our own situation and on other people's, thereby increasing the likelihood that we will be able to cope more effectively with life in general or with the twists and turns of fate. Theoretically speaking, it is also possible to imagine situations where education would have negative effects on our self-contentment. This would be the case, for example, of a person who gains a higher education level and therefore places excessive expectations on himself/herself or on others which are difficult to fulfil. Unlike our premise for health, the impact of education on happiness is not that straightforward from a theoretical angle either.

Leaving aside the indirect correlations through income or health, empirical studies have shown only a few positive correlations between education and happiness (cf. *Blanchflower & Oswald, 2004*, and *Graham & Pettinato, 2000*) and in some cases even negative correlations. Based on the questions asked in the «World Values Survey», it is impossible to determine, either in relation to Switzerland or in relation to Europe as a whole, whether there is a correlation between the highest education level attained and self-contentment (→ Figure 221, cf. *Helliwell, 2002,* and *Peiro, 2002*). Other studies indicate that there does not have to be a linear relationship between education and happiness, pointing to the fact that individuals with an average level of education

221 **Education level and happiness, Switzerland, 2007**

Data: Values Survey Database

Happiness can be determined using a variety of methods (for example observable and non-observable social behaviour). Individuals can also be questioned as to how they themselves rate their level of happiness. The «World Values Survey» asked respondents to answer the following question on a scale of 1 (Very unhappy) to 10 (Very happy): «Overall, how happy are you with your life at the present time?»



3 Most studies regard self-contentment, wellbeing and happiness as synonymous with one another *(Frey, 2008)*. For discussions regarding these various concepts, see also *Veenhoven (2004)*.

displayed the highest level of contentment (see e.g. *Stutzer, 2003*). Empirical evidence for a negative correlation between education level and happiness can also be found, however, with better-educated people generally experiencing significantly lower levels of job satisfaction and happiness (see *Clark & Oswald, 1996,* and *Gardner & Oswald, 2002*).

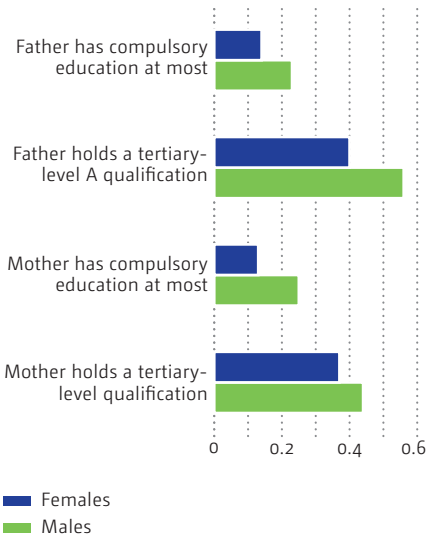
Things become a little clearer if we measure the effects that factors such as income, physical health or mental health (which are positively influenced by education) have on happiness, even if the effects turn out to be very small. Studies that show the positive effects of income on happiness and contentment include *Frey & Stutzer (2002)*, while studies such as the ones published by *Bukenya, Gebremedhin and Schaeffer (2003)* and *Gerdtham and Johannesson (2001)* use data from Sweden and the USA to document the positive effects of health on happiness. What is also evident is the indirect relationship between education and happiness via unemployment. Since unemployment is perceived as one of the most significant negative factors affecting happiness (see *Clark & Oswald, 1996*), education, which reduces the risk of unemployment (→ *Private benefits of education, page 270*), once again indirectly promotes happiness. However, this is a causal relationship because it is not a lack of contentment that gives rise to unemployment, but unemployment that gives rise to a lack of self-contentment (see *Winkelmann & Winkelmann, 1998*).

No studies could be found, by contrast, to confirm the inverse causal relationship between education and self-contentment, even though it also stands to reason that contented individuals are more likely to remain in education.

To conclude, current studies seem to indicate that direct correlations between education and self-contentment are somewhat negligible. At the same time, they point to indirect correlations via factors over which education exerts a positive influence.

222 **Likelihood of an academic education, based on education level of the parents, 1963–1974 cohorts**

Data: *Cattaneo, Hanslin & Winkelmann, 2007*



Intergenerational transfer of education

Parents can derive benefits from the education received by their children, and hence the possibility of offering better educational opportunities to our children through our own educational attainment can be seen as a private return on education.

From a statistical perspective, there is a relatively close correlation between the education received by parents and the one received by their children (→ Figure 222 and/or *Bauer & Riphahn, 2006,* highlight differences in intergenerational transfer rates for Swiss nationals and migrants).

The intergenerational transfer of education is not equally pronounced at all points in time. Using data obtained from the Swiss Household Panel, *Cattaneo, Hanslin and Winkelmann (2007)* analysed the birth cohorts from 1964 to 1973 to determine the influence that the education level of parents had on their children's educational opportunities. They found that this influence was lower than for the 1934 to 1943 birth cohorts. In other words, the likelihood of a child achieving a higher educational qualification than his/her parents has increased in Switzerland over the past few decades. The changes in the intensity with which education received by parents is transferred to children may well depend on the education system itself. Studies

(such as *Dustmann, 2004*) have found that, in education systems that select children on the basis of ability at an early stage, there is a higher rate of intergenerational transmission of education than in education systems that do not select children on the basis of ability until a later stage. One possible reason for this may be that parents' education and expectations will have a greater impact on ability grouping the earlier it takes place. This is due in no small measure to the fact that the true abilities of the child cannot yet be determined with any degree of precision at the early stages of a child's education. The education received by parents not only influences the length of time that children remain in education, it also influences whether children will aspire to achieve academic or vocational qualifications (see *Falter, Ferro-Luzzi & Sbergami, 2008*).

Changes in the extent of the correlation between parents' education and that of their children may also depend on whether the education system is currently in an expansion, contraction or stagnation phase, which would have an impact on higher education. When the education system is expanding (i.e. very many more students are seeking tertiary-level qualifications in the current generation than in the preceding generation), the likelihood that everyone will obtain a qualification at that level will naturally increase. At the same time, children will be less likely to have the same education level as their parents. As far as the expansion of Baccalaureate school and hence university education is concerned, Switzerland underwent a major expansion phase from the 1970s to the early 1990s, in particular. Children born between 1960 and 1980 were therefore much more likely to achieve a higher education level than their parents for reasons that were attributable to the education system itself. Since the mid-1990s, however, the education system has once again entered a stagnation phase in this respect. The effects that this has had on the rate of educational transfer between parents and children are illustrated in Figure 223, which depicts the education level of 2,000 Swiss nationals in 2007. Whether these nationals were between the ages of 25 and 39 or between 40 and 64 actually had no influence whatsoever on the likelihood (just under 40%) of them having the same education level as their father. For the younger generation, however, the likelihood of an individual achieving a lower education level than his/her father increased markedly to just under 30%. For people born prior to 1942, however, this rate was as low as 15%.

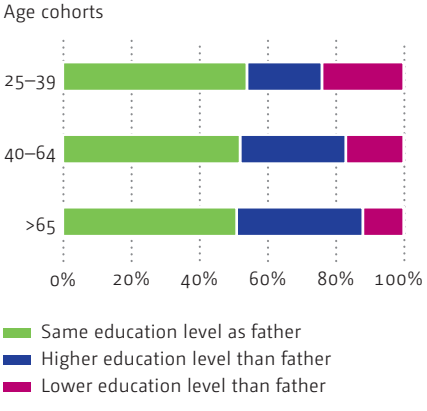
While the extent of intergenerational transfer of education from parents to children is very high in Switzerland, as it is in all industrialised nations, the same questions raised earlier in this report can also be raised here: namely, whether the influence of the parents' education on their children's education is causal in nature and, if so, whether the effects are direct or indirect.

The intergenerational transfer of education (and thereby also of the earning potential and social status associated with education) may well depend directly on the education received by parents. This situation would apply if, for example, a parent looking back at his/her own education felt that education was both beneficial and useful and then had greater expectations for the education of his/her children which, in turn, would further the educational career of these children. Precisely the influence of parental expectations on children's education has been extensively documented in research literature which has also brought to light the fact that parental expectations are shaped by the education that they themselves received. It is also conceivable that parents who themselves spent a long period of time in education therefore

A study carried out by *Falter, Ferro-Luzzi and Sbergami (2008)* concluded that the **transfer of income level** from one generation to another is slightly lower in Switzerland than it is in other countries. The authors attribute this to the fact that in Switzerland, vocational and professional qualifications also provide good economic prospects.

223 **Comparison of education level of children and father, by age group, 2007**

Data: University of Bern, Centre for Research in Economics of Education; calculations: SCCRE



have a greater understanding of the educational landscape and are therefore in a better position to help their children to chart a course through the various educational institutions.

Indirect channels of influence are also possible. First of all, education enables one to earn a higher income and achieve a higher social status, both of which are factors that parents can then use to ensure that their children receive a better education. It is to be expected that indirect factors will exert the greatest positive influence on a child's educational opportunities if the education system places less importance on objective criteria (e.g. actual or potential academic achievement of the children) when deciding whether a child may progress from one year to the next and when deciding which ability group this child should be assigned to. If indirect factors exert too great an influence, then this indicates a lack of equity within the education system. A significant influence of indirect factors has been demonstrated by research (→ *the various Equity sub-chapters in this report*).

Whether a child's education level depends directly or indirectly on the education received by his/her parents has little impact on the individual benefit derived from one's own educational efforts. Parents can be assured that, through their own investment in education, they are also positively affecting the education results of their own children. There is, however, also an explanation for this statistically measurable intergenerational correlation with education which works on the basis of a non-causal relationship.

Researchers are aware that the intergenerational transfer of education may also be attributed to certain genetically based characteristics inherited by children. Many studies have shown that there is a high degree of correlation between parents and children with regard to a body of skills that is independent of education (to a limited extent, this also applies to our IQ) (see e.g. *Black, Devereux & Salvanes, 2008b*). Unlike the direct and indirect influences of the parents' education on that of their children, which were mentioned above, a correlation attributable to inherited intelligence would mean that investing in our children's education would only be worthwhile to a certain extent, if at all. Intelligent people will obtain higher qualifications than their less intelligent counterparts anyway. If intelligence is largely inherited, then it stands to reason that the children of intelligent people will be more likely to achieve higher qualifications even if their (intelligent) parents obtained lower qualifications for whatever reason. Researchers have been trying for many years to determine the extent to which the intergenerational transfer of education and earnings can be attributed to genetic factors. The particular difficulty in carrying out studies of this type lies in the fact that it is almost impossible to separate biological and social factors of influence.[4] Innovative experimental approaches have been used to investigate the correlation between the education level of parents and their adopted children (see e.g. *Björklund, Lindahl & Plug, 2006; Björklund, Jäntti & Solon, 2007; Plug, 2001,* and *Sacerdote, 2007*). Correlations were discovered between adopted children and their non-biological parents as well as between biological parents and their children whom they had given up for adoption at birth. The find-

4 For a summary of the studies relating to the intergenerational transfer of education, see *Holmlund, Lindahl & Plug (2008).*

ings in the first case indicate that the environment in which children grow up plays an important role. In other words, there is a causal relationship between the education level of both generations, with a higher education level of a child with respect to his/her parents also having an impact on the education level of the next generation. The findings for the second case point to the fact that only part of the transfer mechanism is causal in nature and that another part, which cannot be definitively determined, is due to inherited abilities. This means that if parents with educational ability decide not to seek an education, this will not necessarily have negative consequences on the educational path of their children. Or seen from the opposite angle, not every educational endeavour undertaken by «less able» parents will lead to greater educational success for their children.

Social benefits of education

The main difference between the private and social benefits of education is that, in the first case, only the person receiving the education derives any benefit from that education, and, in the second case, other people (who are not necessarily required to obtain an education themselves) will benefit from the educational endeavours of that one individual. Our analysis of the overall benefits of education would be incomplete if we were only to consider the private benefits. More importantly, determining the benefits of education for society is crucial for deciding who is to foot the bill for education. If education brings benefits to society, then society should reasonably pay part of the costs of education, since the entire community will benefit regardless of who receives the education. As for the private benefit, a distinction can be drawn between monetary benefits and non-monetary benefits, with it also being possible to express non-monetary benefits in financial terms.

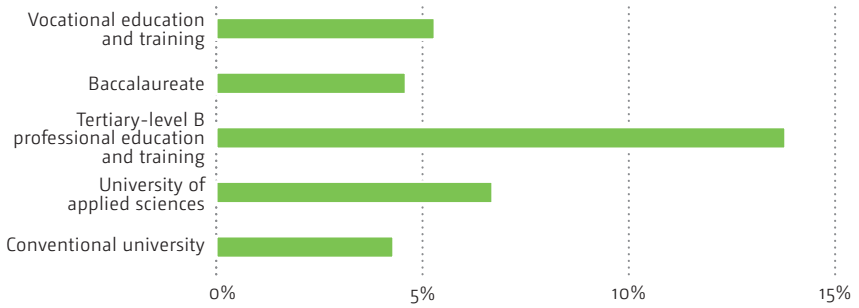
Fiscal returns on education

The most obvious benefits to society are the greater tax revenues that individuals pay from the higher income gained from their education. The fiscal return on investment can be established from this. In its simple form, the return on investment is obtained by offsetting the State's expenditure against the tax income that investment in education has generated through the higher salaries enjoyed by those who received the education. From a purely structural standpoint, three factors play a decisive role in determining the amount of tax benefit derived from educational expenditure. The first of these is state expenditure on education, the second is the relative increase in salary that results from the education (→ *Private benefits of education, page 270*), and the third is the level of tax rate progression. When calculated in this manner, tax benefits generated by men in Switzerland range from approximately 4% (for university education) to 14% (for professional education and training [PET]) (→ Figure 224). For women, the fiscal return is not so high, because the tax income is much lower on account of a large number of women working only part-time or not working at all and the generally lower salaries paid to women.

224 **Fiscal return on education in Switzerland – males**

Return on individual forms of education compared to the next lowest level of education

Data: *Wolter & Weber, 2005*



From a structural standpoint, the State could maximise the tax revenues it receives by reducing its own education expenditure and increasing the taxation progression (see *Weber, 2003*). If we take this line of reasoning to its conclusion, the structural view reveals its shortcomings, and the difficulty in calculating the «true» tax benefits becomes clear. Fiscal returns should actually only include that tax revenue that has a causal link with education. If the salaries of educated persons were high because of their natural abilities, regardless of formal education, then we would not only be overestimating the private benefits of education but also the fiscal benefits. *De la Fuente and Jimeno (2007, 2008)* calculated the fiscal benefits for several European countries, assuming that only 50% of the salary benefits derived from a higher education level are of a causal nature. By adopting this particular method of calculation, their results produced a wide range of different yields for each individual country, from ~~1.~~7% (Sweden) to 6.1% (Ireland). An international comparison of fiscal returns shows that it is primarily the education-based wage differential on the job market that determines whether the State is able to achieve a high fiscal return or not.

Strictly speaking, only those returns that arise when the State pays part of the cost of education should be included in the calculation of the fiscal returns. In other words, we need to determine which individuals would forgo education if the State were to cut back its education subsidies. Theoretically speaking, if individuals were willing to pursue their education despite having to pay all the costs, because the private returns were so high as to make education worthwhile, the State would, strictly speaking, not have generated any yield through making investments itself. The significance of this consideration can also be seen in the high fiscal return (viewed statically) that the State is able to derive from expenditure on PET (→ Figure 224). These yields come into being because the State pays a smaller proportion of the costs of PET programmes than other tertiary-level programmes, on the one hand, and because professional education and training generates relatively large increases in wages, on the other (→ Figure 219). These latter benefits are so high that it can be assumed that there are very few individuals who would not take advantage of this private yield simply because they had to pay more for their education than those at a UAS or conventional university.

Since determining the «true» return on education requires an understanding of how demand for education responds to changes in education funding, it will be very difficult in future too to calculate this return even on an approximate basis.

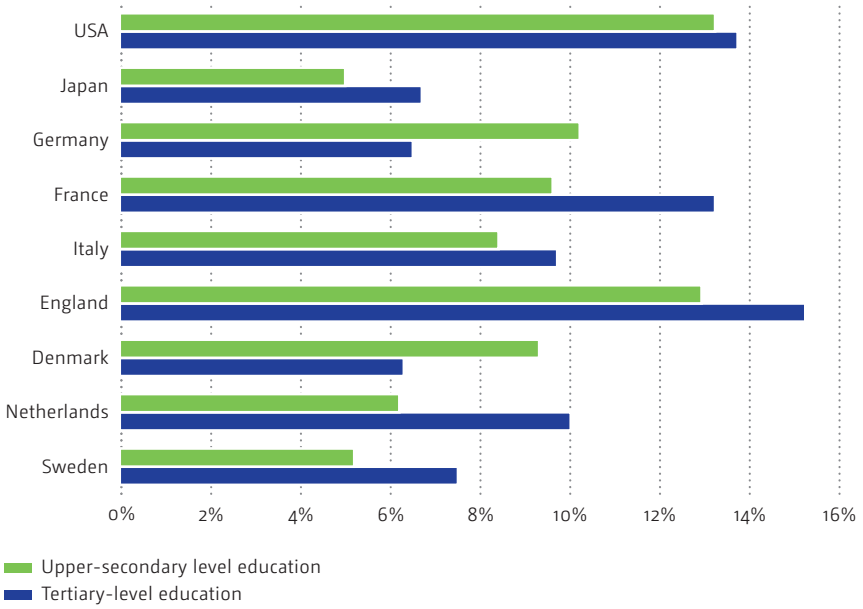
Social returns on education

The costs to society and the benefit that society gains from education overall can be calculated by means of the social returns on education. The social returns on education in the strict sense of the term balance the total private and state costs of education against the total private and fiscal benefits (→ Figures 225 and 226). In the broadest sense of the term, returns take in not only the fiscal yields but also the reduced state expenditure in the social domain and other positive spillovers.

225 **International comparison of the social benefits of education, males, 2000**

Data: *Blöndal, Field & Girouard, 2002*

An international comparison reveals that society derives greater benefit from a tertiary-level education than from an upper-secondary level education in all countries except Germany and Denmark. In Switzerland as well, society derives a greater benefit on average from a tertiary-level education than from an upper-secondary level education (see *Wolter & Weber, 2005*).

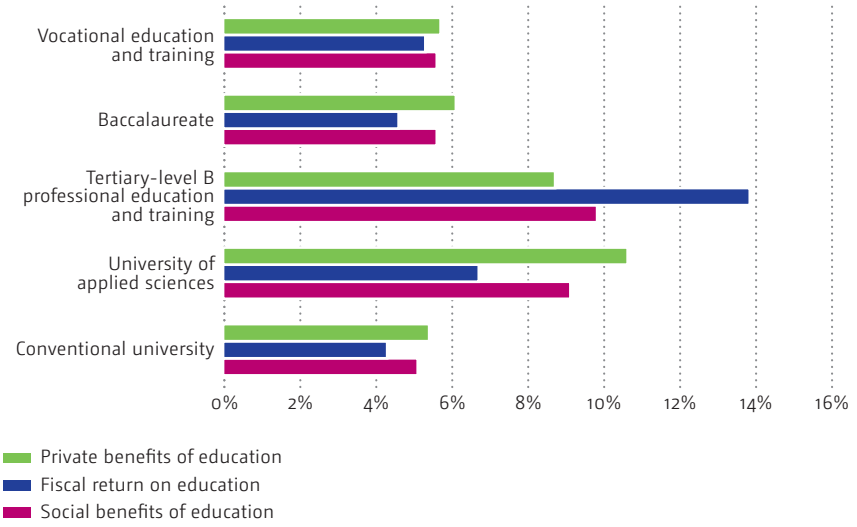


While it is a fairly simple matter to calculate the public expenditure and savings in the social domain (e.g. unemployment, social security transfers or disability insurance) and include this in the social return, other positive effects of the education received by an individual on third parties (spillover effects) are more difficult to calculate. Generally speaking, there are two different approaches used to calculate the extent of positive spillover effects and therefore the social return on education. The first approach measures the impact of education on overall economic growth (→ *infotext on the following page*) and compares the returns thus achieved with the private returns on education. As far as the overall economy is concerned, the correlation between Gross Domestic Product (GDP) and the population's average number of years of education is calculated in a manner similar to the way in which the private returns on education are determined (see e.g. *Heckman & Klenow, 1997*). If the benefit for the economy as a whole increases more sharply than the income of an individual investing in his/her own education, then the wage differential can only be attributed to spillover effects, i.e. social returns.

226 **Private, fiscal and social returns on education – males**

Benefits derived from a higher level of education compared to the next-lowest level of education

Data: *Wolter & Weber, 2005*



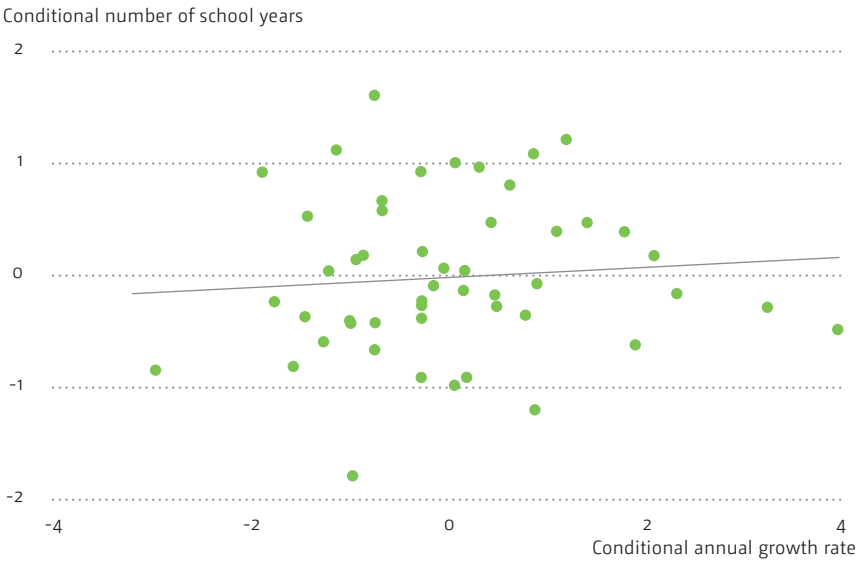
This is because the higher level of overall economic growth indicates that the economy as a whole (society) derives a greater benefit than the individual concerned. An analysis of this type conducted by *Gundlach and Wössmann (2004)*, for example, shows that the benefits to the economy as a whole of one additional year spent in education could be up to 50% higher than the private returns on education for the individual concerned. In other words, individual investments in education also generate returns among those who do not take part in education which are virtually as high as the returns for the individual receiving the education.

Effects of education quality on economic growth

The importance of education for economic growth was formalised back in the late 1980s as a result of major contributions made by the economists Lucas, Barro & Romer (see e.g. *Romer, 1986*) to what is known as the theory of endogenous growth. In contrast to the theory of exogenous growth, which particularly emphasised the accumulation of physical capital, endogenous growth also considered the possibility that human capital could similarly be capable of promoting economic growth. However, the first empirical assessments of these growth models did not provide any conclusive evidence that human capital really does make a key contribution to economic growth (see e.g. *Barro, 2001,* or *Temple, 2001*). Apart from the fact that measuring errors in calculating the stock of human capital in a national economy explained a major portion of the different empirical results, one of the main reasons for the only loose link established between education and growth is that quantitative rather than qualitative criteria were used to determine the human capital within a national economy. This quantitative determination of human capital within a national economy was based on the assumption that the average number of years of education received by a population was representative of the total human capital available. Whether or not a high quality of education was provided during any given school year was not determined in any further detail – one school year was regarded as the same as any other. A simple correlation between human capital and growth rates (⟶ Figure 227) shows that, measured in this way, there is no link between the economic growth of a country and the education level received by its population.

227 **Average annual growth rate and average education level in school years**

Data: *Hanushek & Woessmann, 2008*



228 **Average annual growth rate and average education level (adjusted for quality factors)**

The graph shows the correlation between the conditional number of school years (adjusted for quality factors) and the conditional growth rates in each country.

Data: *Hanushek & Woessmann, 2008*

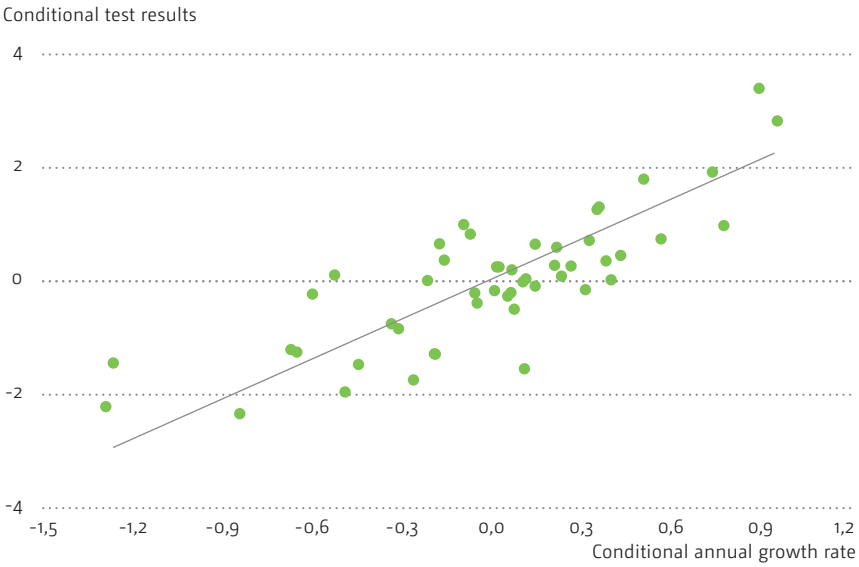


Figure 227 shows the «conditional» school-years and the «conditional» growth rates. «Conditional» means that these figures are calculated as deviations of the actual value from the predicted value. This approach was selected so that if a correlation is observed, this can be attributed to a causal link. If a correlation between the two figures is established, this would mean that an unexpected increase in human capital would produce a growth rate that deviates from the predicted value.

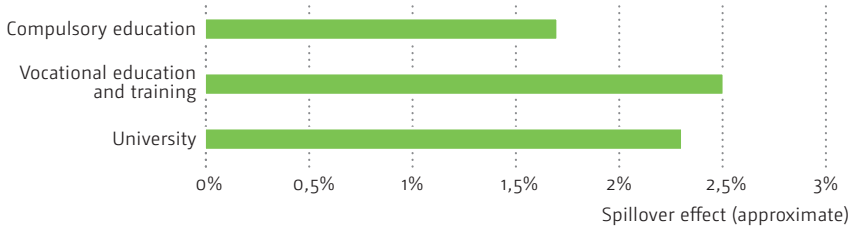
If, however, instead of calculating human capital merely on the basis of the number of years of education, we calculate it on the basis of the number of years of education and weight each of these years according to a quality index (see *Hanushek & Kimko, 2000*), this then gives a clearly positive correlation between the available human capital within an economy and the growth of that economy (⟶ Figure 228). The weighting factors used are test data from international academic achievement assessments tests, such as PISA or TIMSS, since these permit an international comparison. These studies have shown that half of a standard deviation in the PISA assessment (i.e. roughly 50 points on the PISA scale) leads to a one-percentage-point increase in economic growth.

The second approach used to calculate positive spillover effects of education considers impacts at the micro level, i.e. at the level of the individuals receiving education. This approach enables us to directly determine the channels of the positive spillover effects onto other people. There is one «minor» disadvantage, however, since this approach only ever enables us to capture a portion of the spillover effects. The best-studied spillover effects to date are the productivity and wage effects of education on workers in the same company. If individual employees are well educated, this will not only boost their own productivity and hence their income but will also boost the productivity and income of the employees around them (cf. e.g. *Battu, Belfield & Sloane, 2003*).

A study using data from the FSO's Swiss Earnings Structure Survey (see *Wirz, 2008,* → Figure 229) shows that co-workers in the same field will earn 2% more on average if their colleagues pursue education. It is interesting to note that, while all workers benefit from these spillover effects, irrespective of their own education level, those who hold vocational education and training (VET) qualifications tend to benefit slightly more than those at other educational levels.[5]

Spillover effects refer to situations where the education received by one person increases the productivity of others within the company or working group.

229 **Effects of education on the income of third parties, by education level, 1996**
Data: *Wirz, 2008*



Crime

Alongside the economic benefits to society that arise from the education received by individual members of society, society also benefits greatly from education if that education enables it to avoid costs that would otherwise be incurred by society. One particular type of human behaviour that not only generates considerable monetary and non-monetary costs for victims and perpetrators but also for society as a whole are criminal acts, and especially acts that endanger life or limb of members of society. It would be logical to conclude that education can help prevent considerable individual suffering and high economic costs (see e.g. *Feinstein, 2002*). In this regard, various effects of education on criminal behaviour or on the nature of criminal behaviour are both possible and conceivable.

For one thing, education socialises young people «in a positive way». This is achieved by a combination of empathy, ethics and a sense of responsibility. At the same time, education serves as a means of structuring young

5 These findings match those produced by other studies. For example, a study conducted in Portugal found that less qualified workers earned an average of 2–3% more for every year of education attended by highly qualified personnel working for the same company *(Martins & Jin, 2008)*.

people's time. In other words, the fact that they spend their time in school means that they have less time to devote to other, less welcome, activities. Finally, education not only determines the classmates that young people will spend their time with in school. It also determines whom they will spend their leisure time with.

Education has an indirect effect on criminal behaviour by opening up income and career prospects. The benefits that income has on the social behaviour of the individual are twofold. First of all, the higher income derived from education means that the opportunity costs of socially unwelcome behaviour are higher. In other words, people will behave more responsibly if they have too much to lose by behaving irresponsibly. Secondly, income from criminal activities is highly uncertain, i.e. compared to the relative safety of income that can be gained from the time and energy devoted to education. Therefore, risk-averse and risk-neutral individuals will tend to invest in their education.

Statistically speaking, and as far as research is concerned, it is very difficult to establish correlations between education and crime in Switzerland. This is because statistics relating to criminal conduct do not generally include details of the educational background of the individuals who resort to crime.[6] If we use census data, however, then we know which individuals were in prison at the time the Federal Population Census was conducted and we are also able to obtain details regarding the socio-demographic background of those individuals.

Based on these figures, we indeed find that the likelihood of being handed down a prison sentence is higher for both foreign and Swiss nationals who have a lower education level, even though males of foreign origin have a higher rate of arrest in general than males of Swiss origin. This correlation between education and crime is clear even when other factors, such as age, are taken into account. While fairly well established from a statistical standpoint, the correlation between education and crime can be causal but is not necessarily so. Researchers have still not managed to find a method that is capable of establishing reliable causal links.[7]

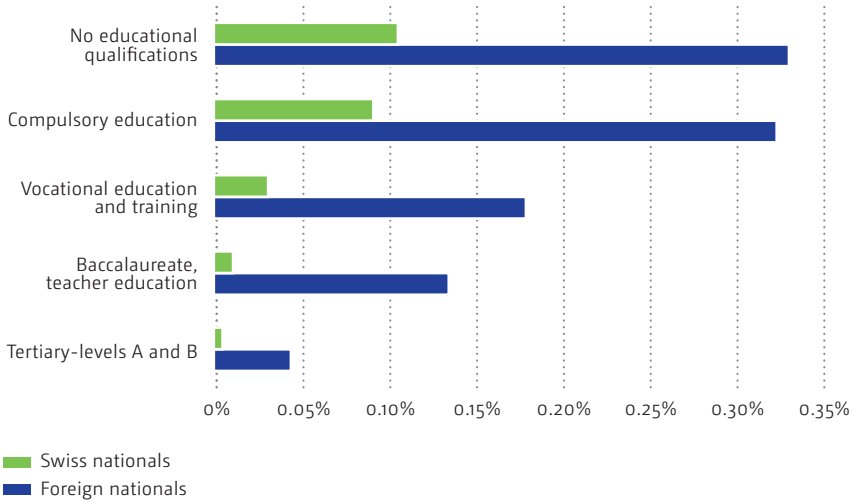
The possible factors that would appear to indicate a correlation between education and crime include both family upbringing and peer-group influences. Young people who devote more time and energy to their education generally come from more highly educated families themselves. In such cases, the non-violent social conduct may actually have come from family upbringing rather than from the education received in school. The likelihood of an American high school student becoming a criminal is up to 8% lower if at least one of the parents holds a college degree (see *Mocan & Rees, 2005*). In other words, at least part of the criminality differential is attributable to the education level of the parents, since students in the same educational setting

6 One exception to this is the study conducted by *Eisner (1997)*. In the Canton of Basel-Landschaft, Eisner found that young people who were still in training in their twentieth year are less given to violent behaviour. Eisner also found that less qualified young people of Swiss origin are more violent than young people from a similar social background who are of foreign origin.

7 The exceptions to this are studies from the USA and Italy, such as those by *Buonanno and Leonida (2009), Lochner and Moretti (2004) and Lochner (1999, 2004)*.

230 **Likelihood of imprisonment – males, 2000**

Data: FSO; calculations: SCCRE



have different likelihoods of becoming criminals. Students who remain in education for a longer period of time are also surrounded by a special group of fellow students, both while attending school and during their free time, and hence it is impossible to determine whether peer group influences lead to different social behaviour or whether this is the result of the education process (see e.g. *Calvó-Armengol, Patacchini & Zenou, 2005*).

It has also been proven that, for those students who remain in education for a longer period of time, selection is encouraged by factors that also favour socially responsible behaviour. As a general rule, students who break off their school career earlier are those with high time preferences (impatient students) (see *Ventura, 2003*) and a lower aversion to risks (cf. *Halek & Eisenhauer, 2001,* or *Belzil & Hansen, 2002*). And it is these very same characteristics that, following a rational consideration of the alternatives, give rise to criminal behaviour. If it is a selection effect of this type that determines the duration of one's schooling and the likelihood that one will become a criminal, then a longer school path would do little to mitigate the crime rate. Education could only be expected to have an effect on criminal behaviour if the education process itself were to have a desirable influence on an individual's time preference and aversion to risk.

A further difficulty in determining a causal link between education and crime is the crime detection rate. This rate is not comprehensive and, depending on the crimes involved, is highly variable. If more highly educated people are more effective at evading capture or are primarily involved in categories of crime for which the detection rate is low, then statistics may significantly underestimate the causal link between education and crime (see e.g. *Mehlkop & Becker, 2004*).

Finally, it is also important to mention the possibility of an inverse causal link. The very fact that they have been found guilty of a crime means that young people are less likely to continue or complete their education or training (cf. *Hjalmarsson, 2008*). In other words, not only can education influence

the likelihood of criminal behaviour but criminal behaviour can also influence the likelihood of spending a longer period in education.

Generally speaking, the cost of criminal acts is extremely high for society as a whole, and the statistical correlations between crime and the education level received by the perpetrator are equally high. However, neither the cost nor the correlation can be used to justify education investment. First of all, as mentioned earlier, the causal links between education and crime have not been proven. Secondly, the scale of crime in Switzerland, and hence the likelihood that anyone will commit a criminal act that has serious consequences for society, is fortunately still relatively low.

Ecological attitudes and action

Society can also benefit from the education of individuals if education promotes social behaviour that helps society avoid costs. Costs of this type can result from behaviour that is environmentally detrimental and could be avoided by adopting an environmentally compatible approach. Education could have a direct influence on ecological attitudes and on acting in an environmentally compatible manner by promoting certain approaches (such as an awareness of the consequences of one's own actions). Empirical analyses have shown there to be a positive correlation between education (the number of years spent in education[8]) and environmental awareness. This positive correlation exists even when other influencing factors are observed *(Franzen & Meyer, 2010)*. However, environmental awareness alone will not suffice. People also need to act in accordance with what they have learnt so as to avoid environmental damage. The link between education and environmental action will thus need to be explored. Various studies have shown, however, that environmental awareness only leads to environmentally compatible action if this action does not cost too much (in terms of both time or money). Costly actions, such as using public transport, are more likely to depend on material incentives rather than environmental considerations *(Diekmann & Preisendörfer, 2003; Stern, 1999)*.

Environmental awareness and actions may also be indirectly influenced by education. This would be the case, for example, if the higher income gained by an individual who has derived a positive benefit from education leads to greater environmental awareness and environmental action. Studies along this line have reached different conclusions, however. While it is difficult to empirically verify causal links, a recent cross-national study[9] did identify a significant correlation between income and environmental awareness, after controlling for education and other factors *(Franzen & Meyer, 2010)*.

8 As for all the other issues referred to in this chapter, the influence of accumulated education on socially desirable behaviour is examined here. It would also be conceivable to examine the effectiveness of specific curriculum content (sustainability education, etc.) to determine whether it had an impact on environmentally friendly behaviour.

9 Two-thirds of the countries examined are members of the OECD. Figures are available for Switzerland.

Political involvement

Most theoretical and empirical research studies are based on the assumption that democratic forms of government give rise to sustainably stabler social structures, which then lead to positive social and economic development. This particular line of reasoning implies that the education of all citizens is a pre-requisite for democracy and, by association, for the involvement of all levels of the population in the formation of political opinion. As far as individual citizens are concerned, it is assumed that education not only encourages people to think rationally and reflect upon things, which is essential for an individual's participation in the opinion-forming process, but also promotes tolerance in relation to other norms and values that are different to one's own, thereby predisposing people to accept decisions that have been reached democratically.

If we review the available research literature in this area, we find that education does in fact have a positive influence on the dissemination of democratic values within the country, measured in terms of the political and civil rights enjoyed by citizens (cf. e.g. *Bobba & Coviello, 2007; Castelló-Climent, 2008*). This research also found correlations at country level between the education level and the degree of democracy and their relative rate of change over time, irrespective of income or other possible influencing factors. The study conducted by *Castelló-Climent (2008)*, for instance, shows that it is not the average duration of education that determines the extent to which democracy exists in a given country. Instead, it is the distribution of education within society. An even distribution of education favours the development of democracy within a given country. The influence of education on the dissemination of democratic values is particularly strong in less developed countries.

As with all of these benefits, it is not always possible to distinguish between correlations and causal links, especially if an inverse causal link is equally obvious and likely. For example, *Acemoglu, Johnson, Robinson et al. (2005)* generally question whether the available studies have provided sufficiently valid evidence in empirical terms of a causal relationship between the education level and the degree of democracy that exists within a population.

While theoretical considerations and statistical correlations seem to indicate that there is indeed a link between education and democracy, the mechanisms that create that link are still largely unexplained. Is it the content of education (e.g. civic awareness, knowledge of state institutions and political processes), or the «socialising role» of school? Or is it equity within the education process that creates the foundations for a democracy to function?

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Abbrevations

A	Austria
AG	Canton of Aargau
AHELO	Assessment of Higher Education Learning Outcomes
AI	Canton of Appenzell Innerrhoden
ALL	Adult Literacy and Lifeskills
AR	Canton of Appenzell Ausserrhoden
ASP	alta scuola pedagogica (= university of teacher education, UTE)
AUS	Australia
B	Belgium
BE	Canton of Bern
BL	Canton of Basel-Landschaft
BS	Canton of Basel-Stadt
CAN	Canada
CAS	Certificate of Advanced Studies
CEFR	Common European Framework of Reference
CH	Switzerland
CHF	Swiss franc
CIIP	Conference of Cantonal Ministers of Education, French speaking part of Switzerland
COHEP	Swiss Conference of Rectors of Universities of Teacher Education
CRUS	Rectors' Conference of the Swiss Universities
D	Germany
DAS	Diploma of Advanced Studies
DeSeCo	Definition and Selection of Competencies
E	Spain
ECTS	European Credit Transfer and Accumulation System
EDK	Swiss Conference of Cantonal Ministers of Education
EENEE	European Expert Network on Economics of Education
EFTA	European Free Trade Association
EKFF	federal commission for family affairs
EKM	federal commission for migration affairs
ETH	federal institute of technology
EU	European Union
Eurostat	Statistics Office of the EU
EVAMAR	evaluation of the academic Baccalaureate reform 1995
f, -f, -F	French (speaking)
F	France
FH	Fachhochschule (= university of applied sciences, UAS)
FHNW	UAS of Northwestern Switzerland
FHZ	UAS of Central Switzerland
FIN	Finland
fl	Flemish
FL	Principality of Liechtenstein
FR	Canton of Freiburg/Fribourg

FSO	Federal Statistical Office
FTE	full time equivalent
g, -g, -G	German (speaking)
GB	Great Britain
GDP	gross domestic product
GE	Canton of Geneva
GL	Canton of Glarus
GPA	grade point average
GR	Canton of Graubünden; Greece
H	Hungary
HarmoS (Agreement)	intercantonal agreement on the harmonisation of compulsory education
HEP	haute école pédagogique (= university of teacher education, UTE)
HEP BEJUNE	UTE of the cantons of Bern (French speaking part), Jura and Neuchâtel
HES	haute école spécialisée (= university of applied sciences, UAS)
HES-SO	UAS of Western Switzerland
HFKG	Federal Act on Funding and Coordination of the Higher Education Sector
HORECA	hotel, restaurant and catering
i, -i, -I	Italian (speaking)
I	Italy
IALS	International Adult Literacy Survey
ICT	information and communication technologies
IDES	Information Documentation Education Switzerland (= documentation centre of the EDK)
IEA	International Association for the Evaluation of Educational Achievement
ISCED	International Standard Classification of Education
IT	information technologies
KFH	Rectors' Conference of the Swiss Universities of Applied Sciences
J	Japan
JU	Canton of Jura
L	Luxemburg
LA	Lausanne
LU	Canton of Lucerne
MAR 95	rules on the recognition of academic Baccalaureates 1995
MAS	Master of Advanced Studies
N	Norway
NE	Canton of Neuchâtel
NL	Netherlands
NW	Canton of Nidwalden
NW EDK	Conference of Cantonal Ministers of Education, northwestern part of Switzerland
NZL	New Zealand
OECD	Organisation for Economic Cooperation and Development
OPET	Federal Office for Professional Education and Technology
OW	Canton of Obwalden

P	Portugal
PER	Plan d'études romand (= common curriculum of the French speaking cantons of Switzerland)
PH	pädagogische Hochschule (= university of teacher education, UTE)
PHZ	UTE of central Switzerland
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PL	Poland
PPP	purchasing power parity
QUIMS	project «Quality in Multicultural Schools»
S	Sweden
SCCRE	Swiss Coordination Centre for Research in Education
SCI	Science Citation Index
SECO	State Secretariat for Economic Affairs
SER	State Secretariat for Education and Research
SES	socio-economic status
SESS	(the FSO's) Swiss Earnings Structure Survey
SFAO	Swiss Federal Audit Office
SFIVET	Swiss Federal Institute for Vocational Education and Training
SG	Canton of St. Gallen
SH	Canton of Schaffhausen
SHIS	information system on Swiss universities
SLFS	(the FSO's) Swiss Labour Force Survey
SME	small and medium sized enterprises
SO	Canton of Solothurn
SODK	Swiss Conference of Cantonal Ministers of Social Affairs
SSCI	Social Sciences Citation Index
SUC	Swiss University Conference
SUP	scuola universitaria professionale (= university of applied sciences, UAS)
SUPSI	UAS of Southern Switzerland
SZ	Canton of Schwyz
TG	Canton of Thurgau
THES	Times Higher Education Supplement
TI	Canton of Ticino
TIMSS	Third International Mathematics and Science Study
TREE	project «Transitions from Education to Employment»
UAS	university of applied sciences
UK	United Kingdom
Unesco	United Nations Educational, Scientific and Cultural Organization
UR	Canton of Uri
USA	United States of America
USI	university of the Italian speaking part of Switzerland
UTE	university of teacher education
VD	Canton of Vaud
VS	Canton of Wallis/Valais
ZG	Canton of Zug
ZH	Canton of Zurich