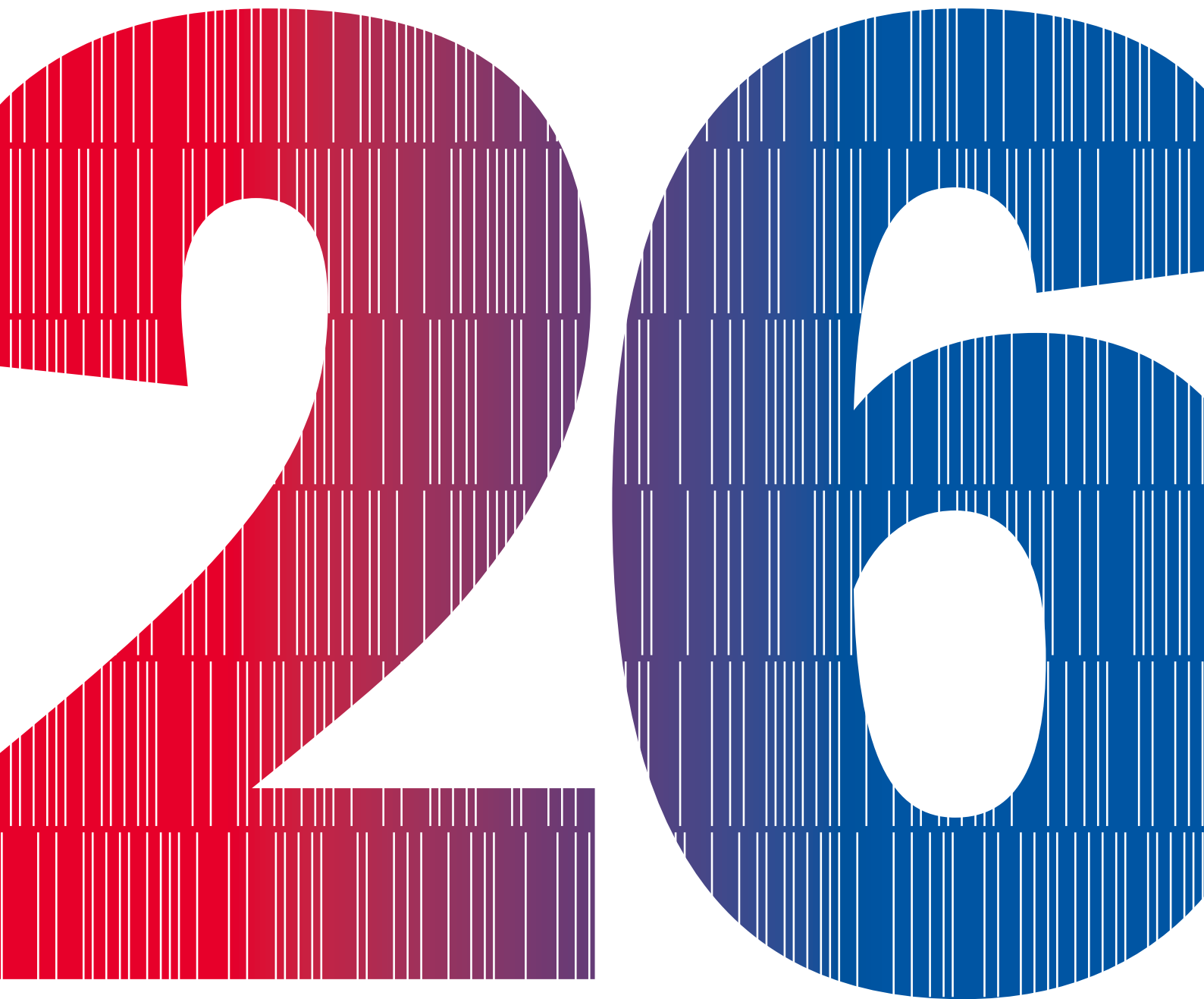
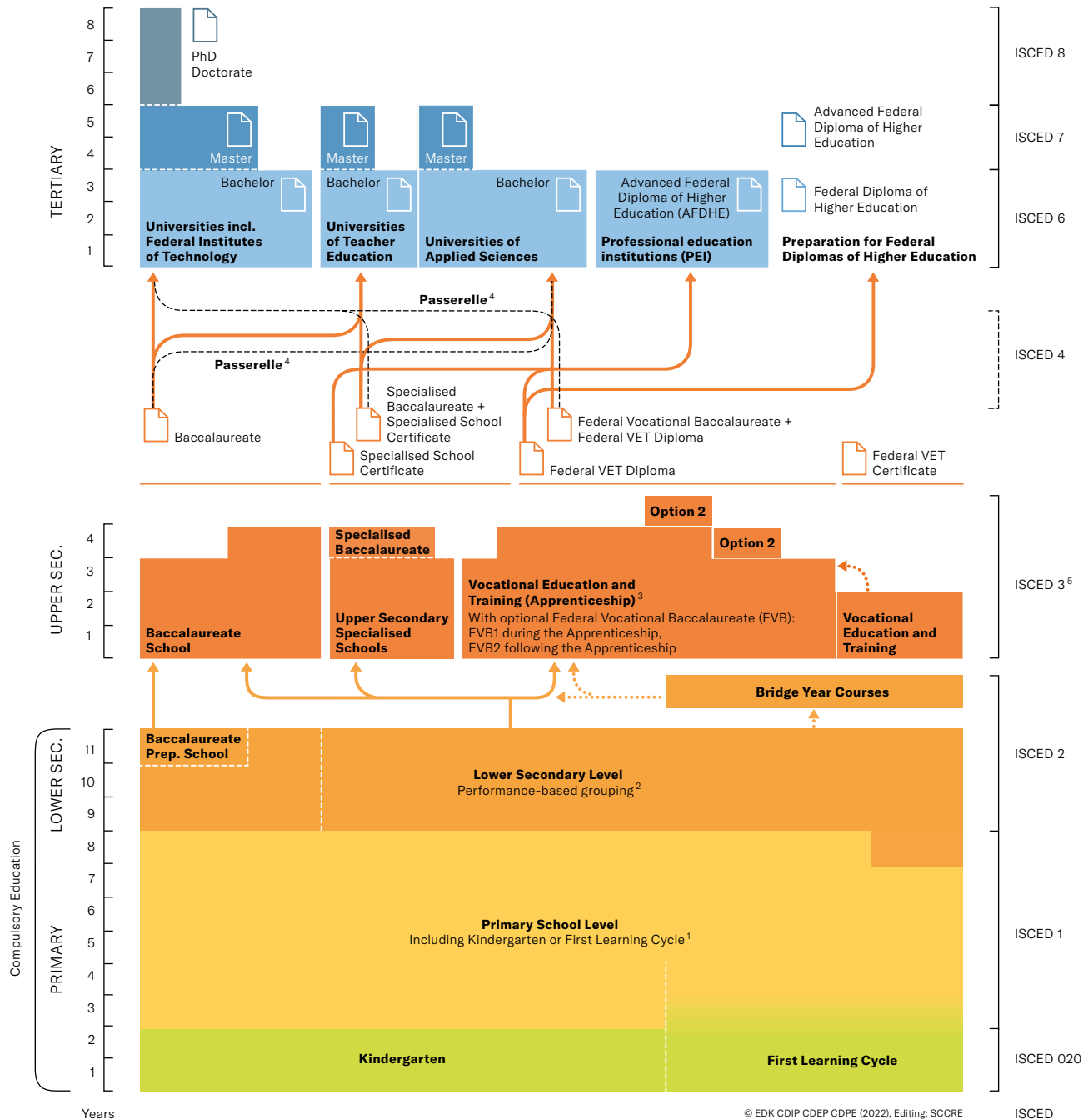




SWISS EDUCATION REPORT

THE SWISS EDUCATION SYSTEM



© EDK CDIP CDEP CDPE (2022), Editing: SCCRE

ISCED
International
Standard
Classification of
Education 2011

Children and adolescents with special educational needs

Support through special measures from birth up to age 20

The responsibility for the precise arrangement of special needs education during compulsory education (special schools, special needs classes, special support integrated in regular classes, etc.) lies with the cantons and is not shown on the chart.

1 Duration of primary level: 8 years. Two years of kindergarten and the first two years of the primary cycle are included in compulsory education in most cantons. In Canton Ticino the primary level lasts 7 years.

2 Lower secondary level: 4-year scuola media in the Canton of Ticino (pursuant to exception clause in Art. 6 HarmoS Agreement)

3 Vocational education and training (apprenticeship): training company + VET school + intercompany courses; full-time school education possible

4 *Passerelle* 1: Baccalaureate → University of applied sciences (vocational internship)
Passerelle 2: Federal vocational or specialized baccalaureate → University (supplementary exam)

5 General educational programmes = ISCED 34
Vocational training programmes = ISCED 35

SWISS EDUCATION REPORT 2026

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FOREWORD BY THE REPORT COMMISSIONERS

**A reference work on
education in Switzerland**

You are holding the fifth issue of the Swiss Education Report in your hands. The Education Report is the reference work of the federal government and the cantons on the Swiss education system. It synthesises current knowledge and presents it according to educational levels and with regard to the aspects of effectiveness, efficiency and equity (equal opportunities). Since its first issue in 2010, the Education Report has become established and serves as an important source of information for the federal government and the cantons as well as for the many stakeholders in the education system. It provides answers to important questions while at the same time highlighting the issues on which there is (as yet) no or insufficient reliable knowledge.

**Decision-making based on
reliable knowledge**

The Education Report is addressed to all persons and institutions with an interest in education issues, be it at municipal, cantonal or intercantonial, national or international level. People making education policy decisions or involved in the quality development of the education system need reliable knowledge as a basis for their actions. Numerous studies with resulting research findings exist, not all of which have the same quality and relevance. Decision-makers are therefore dependent on research results being selected, assessed and processed by proven experts, such as the authors of the Education Report.

**Key product
in education monitoring**

The Federal Constitution requires the federal government and the cantons, within the scope of their powers, to jointly ensure the high quality and accessibility of the Swiss Education Area. In order to fulfil this mandate, they jointly maintain a system of education monitoring. The Education Report is their most important product and instrument. The aim of education monitoring is to grasp the sometimes complex correlations and draw up coherent proposals for the authorities based on an overall view of the education system. The aim is to strengthen the quality of the educational opportunities and of the education system as a whole, to develop the cooperation between educational stakeholders, to examine the processes at the transitions, to ensure the transparency of the courses of education, and to maintain the methodology and integrability of the qualifications. The systemic view of our education system, which goes beyond the respective institutional responsibilities provided by the Education Report, offers a great deal of added value. Critical aspects are addressed on a scientific basis.

**Further developing objectives in
education policy**

In 2011, the federal government and the cantons agreed on common education policy objectives for the first time. The information collected in the Education Report helps to assess the achievement of these objectives and to update them periodically. They are subsequently made public in joint declarations – most recently in 2023.

**Continuously improving the
performance of education monitoring**

This Education Report stands for 20 years of education monitoring. Thanks to the continuous efforts of all parties involved, the conditions for education reporting have been significantly improved during this period. This has led to more useful findings. The Education Report itself made a significant contribution to this process. Not only does it estimate the status of target achievement in education, but also assesses the quality of the data available in the various areas and at the different levels of the education system. Information gaps that make it difficult to produce sound assessments

or plan measures can be identified in this manner and closed by means of systematic collection and additional research. The federal government's integrated statistical systems, which make it possible to link data from different personal registers, constitute an eminently important working basis for education reporting. Both the programme "Longitudinal analyses in the field of education" (LABB) of the Swiss Federal Statistical Office, which provides data and analyses as well as the data records of the PISA studies and the Review of the national educational objectives (ÜGK), which also includes performance data, are particularly important sources for education. These are used in conjunction with other data sources to conduct the valuable longitudinal analyses of educational and career paths.

In addition to the improved data infrastructure, the many contributions by researchers who deal on an in-depth basis with the various facets of the Swiss Education Area also contribute to more efficient reporting on education. We are counting on their continued commitment to gain an ever better understanding of the many complex interdependencies in the education system.

The stakeholders involved in educational cooperation between the federal government and the cantons are pleased with the progress achieved and strongly support further efforts to continuously expand the basis for evidence-supported quality development and planning of measures.

We would like to thank everyone who was involved in compiling this report.

Berne, March 2026, Education Monitoring Switzerland

For the report commissioners

Klára Sokol
Secretary-General
Swiss Conference of Cantonal
Ministers of Education

Martina Hirayama
State Secretary
State Secretariat for Education,
Research and Innovation

20 YEARS EDUCATION REPORT

Two decades of education reporting

On 21 May 2006, the Swiss population voted, with a record 85.6% of votes in favour and no votes against in the cantons, to reorganise the constitutional provisions on education. Although this restructuring did not change the existing responsibilities of the Confederation and the cantons in their respective areas, it did give them a constitutional mandate to be jointly responsible for the quality and transparency of the education system in future. This shared responsibility had far-reaching consequences. One of these was the introduction of joint education monitoring with regular education reporting.

With wise foresight regarding the result of the vote, the Confederation and cantons had already commissioned a pilot report before the ballot, which was to form the basis for regular reporting on education in the future. This report was published in the year of the referendum and thus marks the beginning of education reporting in Switzerland. Since then, five regular Education Reports have been published in addition to the pilot report.

The only aim of the pilot report was to describe the education system with regard to its levels and types, in other words, it is not organised according to specific topics. Apart from that, the mandate was formulated in an open manner. The report was subsequently evaluated not only at a national level, but also by two international consortia – from Germany and Canada. The feedback was incorporated into the first regular Education Report in 2010. The concept established at the time has barely changed since.

Key parameters

Four decisions have shaped educational reporting to date:

1. **Focus on control relevance:** The Education Report only covers those aspects of the education system that are subject to official control. Topics that fall within the autonomy of schools, higher education institutions or teachers are not included. This led to disappointment in practice, as information relevant to day-to-day work was lacking, as well as in academia, where work was not always acknowledged. However, the advantage of this limitation is obvious: It prevents politicians or administrations from being tempted to intervene in educational autonomy on the basis of the report.

2. **Integration into a monitoring process:** The Education Report is not a stand-alone report, but part of a continuous monitoring process. It is also the end and starting point of a cycle: It analyses developments and target achievement as set out in the joint federal and cantonal education policy declaration and identifies new topics and challenges that will be incorporated into the next cycle. The advantage of this integration is that measures to improve reporting – and thus the basis for political decisions – can be developed and implemented in parallel. Education Reports are therefore regularly supplemented by thematic in-depth reports and trigger statistical innovations from which later Education Reports benefit.

3. **No rigid system of indicators.** Choosing a fixed set of statistical indicators, as is common in most education reports, has the undeniable advantage that changes can be tracked and monitored in a standardised manner over time. However, the decision not to introduce this type of indicator system for Swiss education reporting was based on three considerations: Firstly, a rigid indicator system puts reporting in a tight straitjacket, in which comparability over time takes precedence over the relevance of the selected indicators in terms of content. Secondly, neither a single indicator nor a set of indicators can usually depict a phenomenon comprehensively. And

thirdly, a great deal of information exists that is relevant to education governance, such as the results of research, which cannot be translated into an indicator system. The absence of an indicator report has given the Swiss Education Report the necessary flexibility to constantly react to changes in the education system and to the available evidence on a situational basis.

4. Uniform criteria: Despite the flexibility gained without an indicator system, education reporting will only do justice to the concept of monitoring when reports over time and individual chapters can be compared in a single report. This can be achieved by describing and evaluating all types of education, as far as possible, based on the same three criteria: Effectiveness, efficiency and equity. Even if these criteria are operationalised differently depending on the level or type, the uniform grid enables the conditions and developments of the Swiss education system to be more comparable over time and between areas.

The concept of Swiss education reporting is primarily geared towards issues of relevance to education policy – not the current state of scientific knowledge. If the latter were the benchmark, the reports would be more comprehensive, but less focused on the pressing issues. This decision initially led to frustration among readers, who were often confronted with the conclusion that there were no reliable answers to certain questions. However, it is precisely this transparency about gaps in knowledge that is essential for making informed statements in the future. Progress in education reporting therefore depends critically on the fact that data and research deficits are openly identified.

Reporting ideally goes through four stages:

1. Diagnosis: Establishing the current state. Reporting often failed here at first, and sometimes still does today, because the data and statistics needed to describe the current state of affairs are lacking.

2. Root cause analysis: The search for explanations as to why a situation is as it presents itself. Correlations can be found frequently, but causal relationships are more difficult to prove. Thanks to advances in educational research, this is possible more often today than 20 years ago, but even today is only possible with a manageable number of questions.

3. Analysis of measures: Once the causal factors of a phenomenon have been identified, the question of which interventions would be appropriate to remedy shortcomings and make progress can be analysed. Potentially, even with a clear root cause analysis, several measures are usually conceivable to bring about change, but not all of these measures are (equally) suitable.

4. Monitoring change: Only if stages one to three had been systematically run through would the cycle be complete and systematic monitoring of the changes in the system possible, from diagnosis to investigation of the causes, to determining the measures and finally to monitoring the effects.

Despite major advances in statistics and research, education reporting on most relevant issues only remains at levels one and two even after 20 years. However, this is only partly due to the fact that the development of knowledge in data generation and subsequent research analysis is too slow, but also – which is frequently overlooked – to the fact that the environment of education is constantly changing and thus with it the problems and issues of education policy. Educational reporting therefore faces a challenge that could also be described as aiming at a moving target.

Principles and challenges

Impact and significance

The question remains as to whether reporting actually improves the education system. The short answer is that educational monitoring is not a sufficient but a necessary condition for improvement. Without systematic monitoring, only trial and error remains, with the risk of misusing resources or even taking counterproductive measures.

Education reporting thus contributes to a better education system in two ways. It creates both the knowledge base for gradual improvements and provides information and insights to prevent developments that would change the system for the worse.

For the authoring team

Prof. Dr. Stefan C. Wolter
Director of the Swiss Coordination Centre
for Research in Education

GENERAL CONTEXT OF THE SWISS EDUCATION SYSTEM

Introduction

The chapter provides an overview of three groups of factors with a direct or indirect impact on all or part of the Swiss education system. The first of these is demographics, which determines not only the number of school pupils but also the numbers of those persons who finance education via tax on their income. The second group comprises factors that affect the behaviour and experiences of children and young people outside school. They outline the wider context of the needs and requirements of the children and young people which the education system needs to cater for. The third group includes a series of economic factors. On the one hand, the analysis of these shows the fiscal scope for investment in education. On the other hand, they illustrate the demands placed on the education of the working population with a view to the labour market.

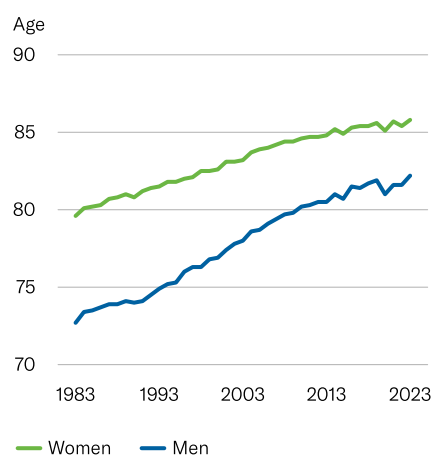
Demographics

Demographic trends are one of the most important framework conditions affecting the education system. Cyclical fluctuations in the number of pupils could largely be offset by adjustments to the class sizes, but this is not always the case. Long-term demographic trends, on the other hand, must always be countered by expanding or reducing educational opportunities. Since demographic changes affect the individual school levels and school types to varying degrees and at different points in time, these changes will be analysed in greater detail in the following chapters.

Population development

1 Life expectancy of women and men, 1983–2023

Data: FSO



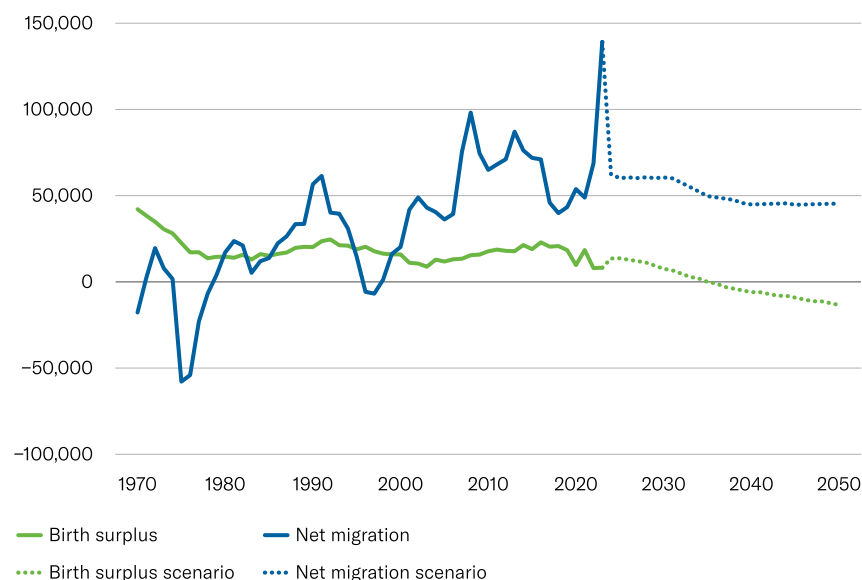
Since the beginning of the 20th century, the population of Switzerland has almost tripled. At the end of the second quarter of 2024, the nine million mark was exceeded for the first time (FSO, 2024d). Population development is determined by additions (births and immigration) and departures (deaths and emigration). If there are more births than deaths in a given year, this is called a birth surplus. In recent decades, increasing life expectancy has had a positive impact on the birth surplus despite the falling number of children per woman (→ Figure 1). The rise in life expectancy means that fewer births are needed per woman to ensure generation replacement. Since the new millennium, the increase in life expectancy has slowed significantly; due to the excess mortality in 2020 due to the COVID-19 pandemic, it even declined in the short term. In the years 2021 and 2022, the figure stabilised again to pre-pandemic levels. For the education system, however, the birth rate per woman is decisive, as it influences pupil numbers. A birth boom at the start of the new century came to a halt in 2018/19, rising again briefly in 2021—during the second year of the COVID-19 pandemic. While there was a peak in births in 2021 due to the pandemic, the number of births has since been falling steadily. With 78,081 live births in 2024, the number of births was almost 13% below the 2021 peak and still 11% below the pre-COVID-19 peak in 2018 (FSO, 2025b). However, population growth in general, and above all the extent of the fluctuations in

growth, are determined less by the number of births and much more by net migration, in other words, the difference between immigration and emigration (→ Figure 2).

2 Population development, 1970–2050

Birth surplus and net migration; forecast from 2024–2050 (reference scenario)

Data: FSO



The sharp increase in net migration is partly due to the fact that persons from Ukraine have been part of the permanent resident population since 2023. In 2023, a total of 263,800 persons immigrated (+38.2% compared to 2022). Around one-fifth of immigrants are persons with protection status S from Ukraine.

Rising migration figures

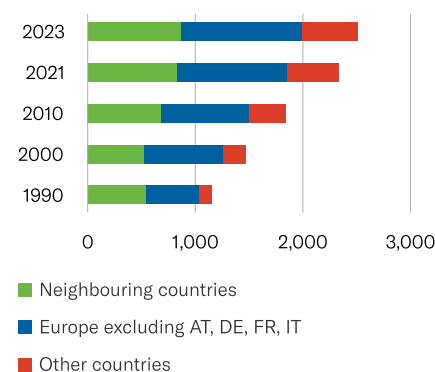
Net migration over the last two decades has led to a sharp increase in the proportion of foreign nationals living in Switzerland. At the end of 2023, some 2.5 million people, or 28% of the total population did not have Swiss citizenship (→ Figure 3). However, the year-on-year growth in 2023 is mainly due to persons from Ukraine who had to flee due to Russia's attack on Ukraine (FSO, 2024i).

The introduction of the freedom of movement of persons with the EU in 2002 brought with it not only an increase in the number of foreign nationals resident but also a change in the composition of this population group. On the one hand, the proportion of immigrants from neighbouring countries fell. At 34.8% in 2023, it was lower than that of immigrants from the rest of Europe (2023: 44.8%). On the other hand, the agreement on the free movement of persons also limited immigration from non-European countries, the proportion of which has now been stable at around 20% for several years.

3 Foreign residents in Switzerland by nationality, 1990–2023

In thousands

Data: FSO



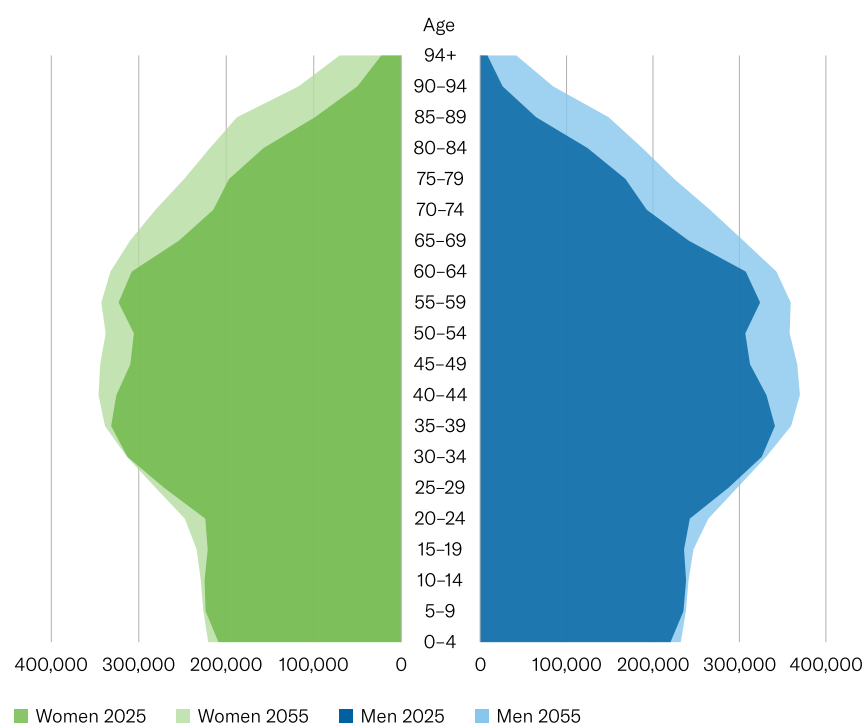
Ageing population

Fluctuations in the birth rate as well as changes in life expectancy and net migration are also transforming the age structure of the population. The proportion of older people in the population is currently increasing particularly rapidly because the baby boomer generation born between 1950 and 1964 are in the second half of their lives. The proportion of people over the age of 65 in the total population was 19% in 2025, and according to forecasts by the Federal Statistical Office (FSO) will rise to around 24% by 2055 (→ Figure 4).

4 Age distribution

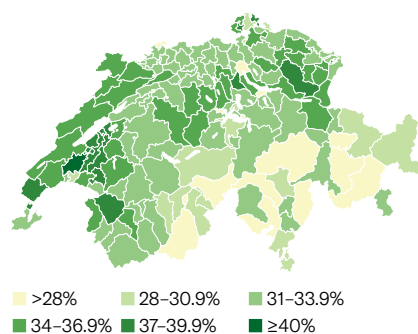
Age distribution 2025 and 2055 (reference scenario)

Data: FSO



5 Youth quotient by district, 2022

Data: FSO



Regional differences in the youth quotient

The proportion of young people in the total population differs by canton and region (→ Figure 5). The youth quotient measures the proportion of young people aged under 20 relative to the working-age population (aged 20–64). It provides an indication of the amount of the financial burden to be borne by the working population in relation to the school-age population (up to and including upper-secondary education). On average across Switzerland, the youth quotient remained unchanged at 32.7% in 2022, which means that there are approximately three people of working age for every young person. Youth quotients are often below average in urban and tourist regions; they are above average in Central, Eastern and French-speaking Switzerland.

Family structures and the risk of poverty

Family structures and thus social lifestyles have changed considerably over the past forty years. More private households without children and single-person households have evolved (→ Figure 6). Households with children accounted for 32% of all private households in 2023. The proportion of couples without children was 27% of all private households. However, some of these couples will still have children. The number of single-parent households has increased continuously over the past 50 years and in 2023 accounted for 5% of private households and around 17% of all households with children.

The size and composition of households have a direct impact on the risk of poverty and thus on the children and young people's life situation. In 2025, the Federal Council published the poverty monitoring system compiled by the Federal Social Insurance Office (FSIO) for the first time (FSIO, 2025), which provides a comprehensive data basis for analysing the poverty situation in Switzerland. As in many other countries, poverty in Switzerland is measured using two complementary concepts – absolute poverty and relative risk of poverty. The absolute poverty threshold is based on a socially defined subsistence minimum. It includes the necessary expenses for basic living needs – including housing, food, clothing, medical care and a minimum level of social participation. According to the guidelines of the Swiss Conference for Social Assistance (SKOS), this threshold was CHF 2,284 per month on average for an individual and CHF 4,100 for a household with two adults and two children in 2024.

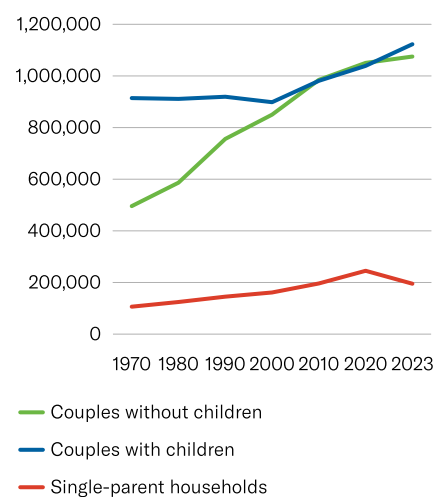
Relative poverty is determined by available equivalised disposable income and is considered an indicator of social exclusion. A person is considered to be at risk of poverty if his or her income is less than 60% of the median disposable equivalised income. In 2023, this corresponded to CHF 2,599 for an individual and CHF 5,457 for a family of four.

Households with no earned income, single parents, persons with a low level of education, people with a migration background and older people with inadequate retirement provision are particularly affected by poverty or the risk of poverty. Children in economically disadvantaged households also have a significantly higher risk of poverty. In Switzerland, a good 15% of the total population was at risk of poverty in 2020.

The results of the 2023 Survey of Income and Living Conditions (SILC) conducted by the Federal Statistical Office show that 8.1% of the population was living below the absolute poverty threshold. In addition, around 10% of respondents stated that they were struggling to manage financially by the end of the month. Families with many children and single-parent households are particularly affected, with more than a quarter being at risk of poverty. This is true for only 6% of working-age couples without children. Families with under-age children are more likely to be at risk of poverty than families with grown-up children. For single-parent households with children aged between 0 and 17, the risk of poverty is 33.4%, while this figure falls to 16.1% when the children are aged 18 to 24. This is an indication firstly that parents' income increases as they get older and secondly that, after completing their compulsory education, young people often transfer to an apprenticeship, thereby taking the pressure off the family finances with the income that they earn. However, the fact that households only manage to avert the risk of poverty when the children get older also

6 Number of family households by household type, 1970–2023

Data: FSO



means that children and young people are particularly likely to be affected by poverty during the period of compulsory education.

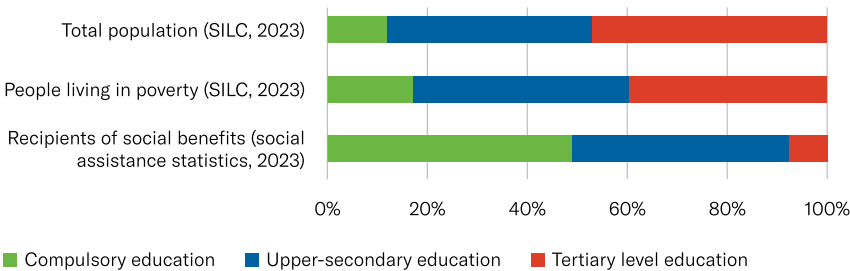
Poverty monitoring also deals with in-depth thematic studies. The first report analysed above all the link between education and poverty (FSIO, 2025). A reciprocal relationship exists between the two: Financial constraints in childhood or adulthood can lead to a shortened period of education, while a low level of education, in turn, increases the risk of poverty. Although the risk of poverty tends to decrease as education levels rise, higher education does not fully protect against poverty.

Around 86% of 25- to 64-year-olds have a post-compulsory education qualification, yet around 75% of those affected by poverty in this age group also comprised people with this qualification. However, poverty in higher education does not necessarily go hand in hand with government support. Persons with tertiary or further education tend to have more access to savings or assets that can be used to cover their livelihood than people without further education (→ Figure 7).

7 Education level by poverty and social welfare status, 2023

Persons aged between 25 and 64 years

Data: FSIO (2025)



Children and young people of school age

The factors that can influence school learning and development of children and young people include many aspects, such as physical and mental health and delinquent behaviour. Both aspects have a potential impact on young people’s own educational paths as well as that of their fellow pupils. This is the case, for example, when young people are confronted with physical or psychological violence in their environment; this is also the case when young people adversely affect other young people, such as in the case of bullying. With regard to the latter, cyberbullying in particular is now taking on greater significance, as social life is increasingly taking place among young people in the digital sphere.

The health of children and young people in Switzerland

Physical activity decreases with age: Seven-year-old children are still active for almost two hours a day at moderate to high intensity, while 16-year-olds are only active for 40 minutes a day. Inactive children also have less

access to sport in the long term and stop doing sport earlier. Children with higher levels of physical activity rate their own motor skills more positively. The less stress children and young people have, the more likely they are to comply with activity recommendations (60 minutes per day) (Hänggi *et al.*, 2023). As with many correlations, it is not clear whether this is causal and, if so, in which direction.

One aspect of children and young people's health that gets a lot of attention is their weight. The proportion of children and adolescents with overweight and obesity increases with age (→ Figure 8). Children with foreign nationality and whose parents have a lower level of education are much more likely to be affected by obesity. Boys are slightly more likely to be obese than girls (Stamm *et al.*, 2024). Overweight children and adolescents are more likely to experience psychological problems and are also more likely to be affected by bullying (Cheng *et al.*, 2022; Sutter *et al.*, 2023). In addition, being overweight correlates negatively with school performance. For all three factors, however, only one correlation and no causal relationship can be established.

Psychological health

According to the latest figures from the FSO, 84% of the total population over the age of 15 describe themselves as happy, but 14% also have symptoms of a moderate level and 4% have symptoms of a high level of psychological stress (FSO, 2024m). According to the HBSC (Health Behaviour in School-Aged Children) study, 85% of 11–15 year olds report that their health is good to excellent. However, a comparison of the 2022 results with those of 2018 shows that there is a significant deterioration in the indicators of mental health and well-being. 13- and 15-year-old girls are particularly affected (Delgrande Jordan *et al.*, 2023) (→ Figure 9).

The consequences of psychological stress can lead to suicide. However, the suicide rate among adults in Switzerland is on the decline – in 2022, it stood at eleven suicides per 100,000 inhabitants. 14,138 people were hospitalised in 2022 due to (suspected) suicide attempts. It is striking that the rate of hospitalisations due to alleged suicide attempts amongst 15- to 19-year-old women has more than doubled since 2017 (2017: 3.8, 2022: 9.5). The figures amongst men aged between 15 and 19 also almost doubled, but at a lower level (2017: 1.5, 2022: 2.7). Due to the low number of cases, it is not possible to make a reliable statement about trends for children under the age of 15 (Peter & Tuch, 2024).

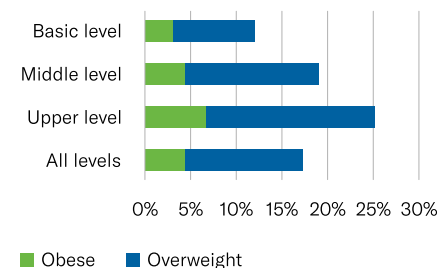
Psychological problems in children and adolescents have been repeatedly associated with increasing internet use (Donati *et al.*, 2025). For the first time, recent studies have investigated the relationship between the use of social media and mental health problems in adolescents. While some studies found no association (Ferguson *et al.*, 2025), others were able to identify a negative impact of social media on mental health. Girls from educationally disadvantaged parents are usually most affected (Abrahamsson, 2024; Mader *et al.*, 2025; Santos *et al.*, 2023).

8 Children with overweight and obesity

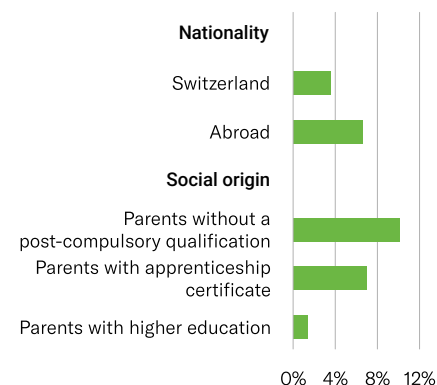
Period: 2017/18–2022/23; for the cities of Basel, Bern and Zurich

Data: Stamm *et al.* (2024)

By school level



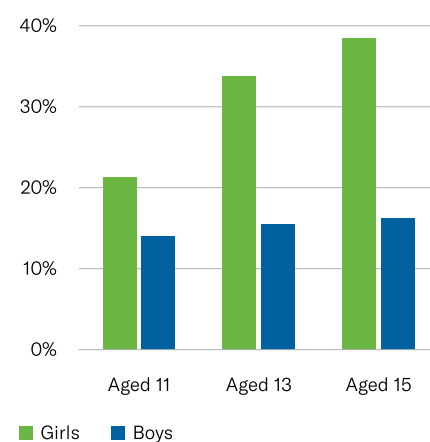
By nationality and social origin (obesity only)



9 Psychosomatic symptoms

Psychosomatic symptoms include: Difficulty sleeping, dizziness, feelings of depression and nervousness

Data: Delgrande Jordan *et al.* (2023)



Media use and cyberbullying

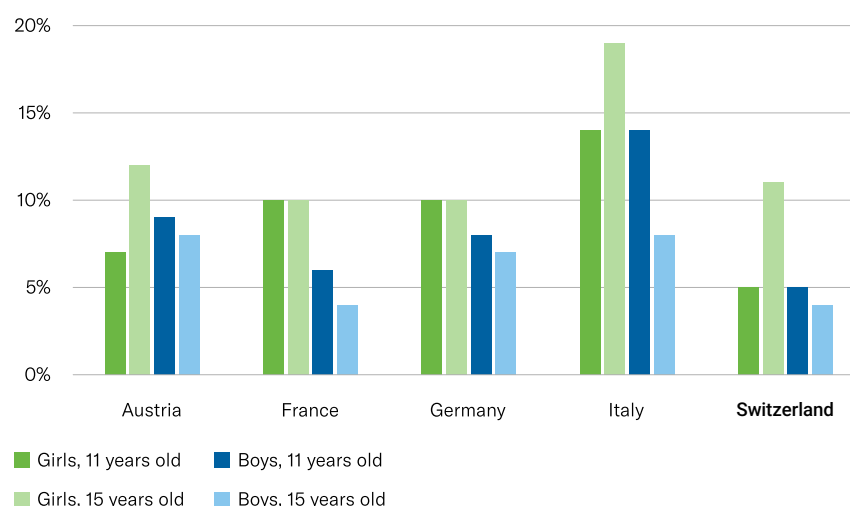
The latest JAMES study (Youth, Activities, Media – Survey Switzerland) shows that there is a saturation tendency in media use by young people. The digital routines and habits of young people seem to have become entrenched in everyday life. On average, the Internet is used daily for three hours during the week and four and a half hours at weekends (Külling-Knecht et al., 2024).

The HBSC study also provided data on problematic social media usage (→ Figure 10). Girls are affected more often than boys. Looking at 11 to 15-year-olds, problematic use is increasing from year to year. The increase is driven by girls, while boys' use is stable or even declining slightly. Compared with neighbouring countries, Switzerland often has the lowest values.

10 Problematic use of social media

Persons who answer "yes" to at least six out of nine items on the "Social Media Disorder Scale" are classified as problematic users. The items deal with issues such as loss of control, social conflicts and behavioural changes.

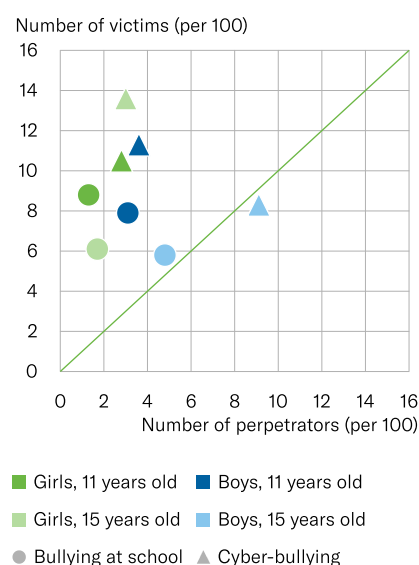
Data: Delgrande Jordan et al. (2023)



11 Perpetrator-victim relationship

A victim (or perpetrator) is anyone who claims to have been bullied at least two or three times in the past few months (or to have bullied themselves).

Data: Delgrande Jordan et al. (2023)



The more frequent media use does not only affect the way young people interact socially, but also means that bullying increasingly takes place in the virtual sphere. The HBSC study investigated how often, in recent months, children were victims or perpetrators of bullying at school as well as cyberbullying. A distinction was made between two age categories – 11- and 15-year-old children and adolescents (→ Figure 11). Girls in both age categories were significantly more likely to be victims than to be perpetrators compared with boys. The relationship between the 11-year-old girls and boys of the same age is particularly striking when it comes to bullying in the school environment. Interestingly, among 15-year-old boys, cyberbullying is the only category in which the ratio of perpetrators to victims is below one – meaning that there are more perpetrators than victims. As the situation is different for girls, this could also be an indication that girls are more likely to become victims of male perpetrators, especially in the digital

space. However, such assumptions cannot be substantiated on the basis of the available data, as the perpetrator's gender was not queried. In addition, it is also possible that a single perpetrator more often has several victims in a cyberbullying environment than in a physical environment.

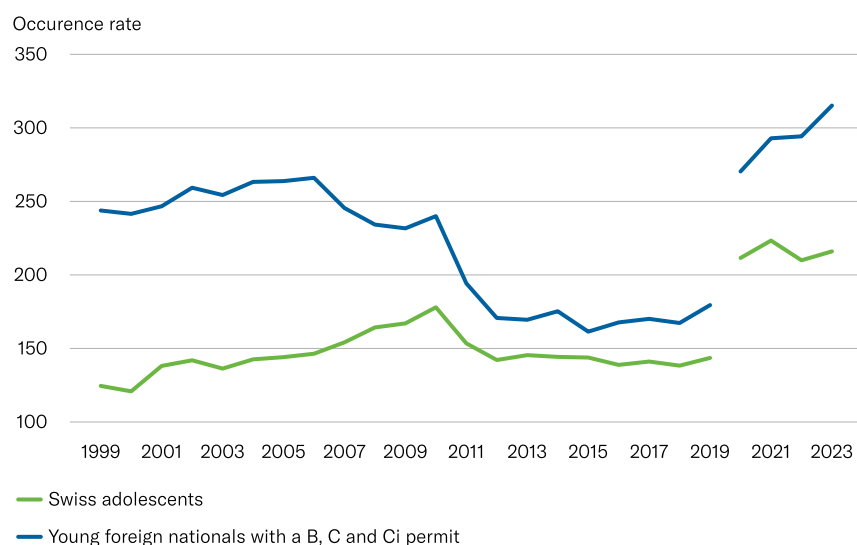
Juvenile delinquency

Statistically recorded serious juvenile delinquency – involving cases leading to a conviction – was stable over the period 2010–2019 (→ Figure 12), in particular due to the decrease in the number of crimes committed by young people with a migration background. The reasons for the convergence in the occurrence rates of delinquency in Swiss and foreign national adolescents have not yet been empirically investigated. Since 2020, crimes committed by young people with a migration background have increased once again. In 2023, 11% more youth verdicts were pronounced than in 2022. Among adults, on the other hand, the number of convictions decreased by 1.4%. Looking at the period from 2015 to 2023, a significant increase in youth verdicts can be observed in all subgroups. The increase in youth verdicts among male adolescents (+38.5%) was practically the same as among female adolescents (+32.7%). In terms of nationality, juvenile sentences for persons with a Swiss passport increased by 23.7%, while those for foreign nationals increased by 43.9%. The increase is most pronounced amongst the youngest offenders. The number of people under the age of 15 convicted of a criminal offence under the Swiss Criminal Code thus increased by 60.2% between 2015 and 2023 (FSO, 2024t).

12 Convicted adolescents, 1999–2023

Convicted adolescents and foreign national adolescents (B, C and Ci permits) living in Switzerland; occurrence rate (number of convicted people per 100,000 adolescents of the same age)

Data: FSO



The data up to 2019 only includes convictions under the Swiss Criminal Code, the Swiss Narcotics Act, the Federal Act on Foreign Nationals and crimes or misdemeanours under the Road Traffic Act. From 2020 all verdicts under the Juvenile Criminal Act are included.

Potential explanations for delinquent behaviour among adolescents include socio-economic and cultural background, criminality in the adolescents' environment (such as contact with delinquent friends or experience of violence at home) as well as individual personality traits and behaviours, such as low self-control and alcohol or drug consumption (*Baier, 2019; Ribeaud & Loher, 2022*). These factors can influence each other; here too, causal effects are difficult to prove, as delinquency and school success are in a reciprocal relationship: However, studies have found that delinquency correlates with a negative school climate, poor school performance, difficulties in social behaviour (especially bullying) and frequent truancy (*Rabold & Baier, 2007; Reinecke & Stemmler, 2016; Ribeaud & Loher, 2022*).

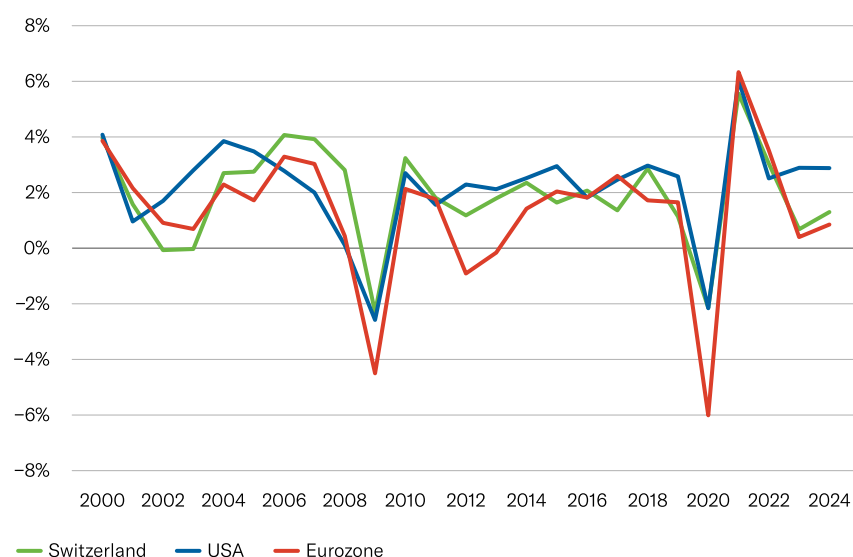
Economy, government debt, labour market

Growth

Since 2000, the Swiss economy has recorded real growth of almost 1.9% per annum, slightly below the growth momentum of the US at 2.1%, but well above the growth of the Eurozone, which for the same period amounted to 1.3% (→ Figure 13). At the beginning of the new millennium, Switzerland also experienced two recessionary phases. Although these were similar in their extent, they were very different in their characteristics. Switzerland – like the entire global economy – experienced its first recession in the wake of the 2008–2009 financial crisis and then the fiscal crisis; the second was a consequence of the COVID-19 pandemic in 2020. While both recessions were similar in their extent, with a decline in gross domestic product (GDP) of around 2%, they were both overcome equally quickly. By contrast, the impact of the two crises on the labour market and the state budget varied. While the financial crisis in Switzerland, in contrast to the EU, was absorbed without major upheavals in the state budget, the second recession took a different course. It was only thanks to massive government intervention that a much stronger collapse in the real economy could be prevented. Above all, however, this increased the federal government's debt, which has to be offset by austerity measures over the next few years.

13 Growth rate of GDP per capita, 2000–2024

Data: OECD

**Government expenditure and debt**

In the wake of the COVID-19 pandemic, the federal government was forced to spend around 35 billion Swiss francs in extraordinary expenses to mitigate the economic and health consequences. This led to a sharp increase in federal debt in 2020 (→ Figure 14), after this had been falling steadily since 2004—with a brief interruption in 2016—not only in relation to the GDP, but also in nominal terms until 2015.

By the end of 2024, the remaining extraordinary expenses incurred in connection with COVID-19, after deduction of the corresponding income, amounted to more than CHF 26 billion. According to the Financial Budget Act, these must be reduced by 2035 at the latest. Debt can be reduced either through structural revenue surpluses or through grants from the Swiss National Bank (SNB). If the latter were not to make any contributions, compliance with the legal requirements would mean that almost CHF 2.5 billion would have to be generated annually in regular budget surpluses.

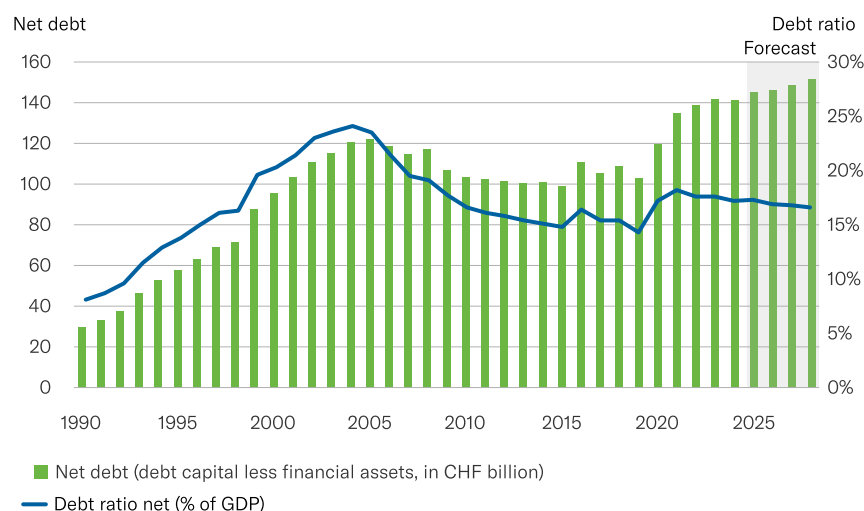
In addition, the federal budget will be heavily burdened by additional planned spending on national defence from 2030. In order to reach the target of providing one percent of the GDP for military purposes, up to CHF 3 billion would be required on an annual basis. In view of this, the federal government is obliged to make savings in other areas of expenditure if no additional revenue can be generated.

In response to these fiscal challenges, the Federal Council submitted the EP27 relief package for consultation at the beginning of 2025. This envisages annual savings in the order of CHF 2.7 to 3.6 billion from 2027. Spending on education and research has been particularly affected. Among other things, it is planned to cut contributions to the Swiss National Science Foundation (SNSF), Innosuisse as well as continuing education, but also to align higher education funding more closely with the principles of benefit orientation.

14 Development of net debt and debt ratio of the Confederation

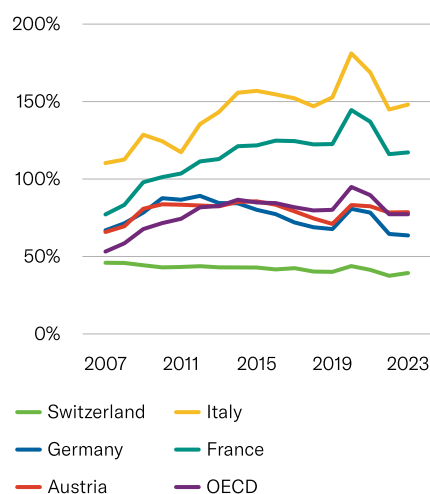
Development 1990–2024, from 2025 forecasts in accordance with the federal government's financial plan

Data: FSO

**15** Government debt, 2007–2023

Government debt as share of GDP

Data: OECD



The projected decline in the debt ratio measured against GDP is a result of projected economic growth, which is expected to be slightly higher than the increase in debt over the forecast period. This also means that the situation could be reversed quickly in the event of a recession. Not least because of the average balanced finances of the cantons and municipalities, total public debt in Switzerland is considerably below the debt average of the OECD countries and our neighbouring countries (→ Figure 15).

At cantonal level, education expenditure accounts for a large proportion of their public expenditure; however, there is considerable variation, both in terms of total public expenditure as well as in terms of cantonal economic performance. Although the two variables correlate positively, it is not always the case that cantons in which education expenditure accounts for a larger proportion of public spending automatically spend a greater proportion of their economic performance on education. One example of this is the economically strong canton of Basel Stadt: It spends an above-average proportion of its public funds on education, while only a below-average proportion of its cantonal economic performance is used for this purpose. Similar to the canton of Basel Stadt, however, all cantons with a cantonal university spend around 5 percentage points more on education than cantons without a university. It must be considered here that the expenditure side is only a gross view; in other words, income from inter-cantonal financing of university students would also need to be taken into account in a net view (→ Figure 16).

16 Educational expenditure by canton, 2022

Expenditure as a share of total public expenditure and GDP

Data: FSO

In % of total public expenditure



Development of the Swiss labour market since the pandemic

The Swiss labour market has proven remarkably resilient in terms of the COVID-19 pandemic. The pandemic-related increase in unemployment in 2020 remained comparatively moderate and amounted to less than one percentage point thanks to the widespread use of short-time working compensation. Despite the economic restrictions to contain the pandemic continued until 2022, the unemployment rate then fell rapidly and only started to rise again from summer 2023.

This development took place against the background of a steady increase in employment since the pandemic-related slump in 2020. In the first quarter of 2025, around 5.34 million people were employed in Switzerland – an increase of almost 7% compared with the low point in the first quarter of 2020. Because part-time work is very common, the number of full-time equivalents is actually around 17% lower. However, even in terms of full-time equivalents, there has been a dynamic and sustained recovery as well as a further development in the labour market since the pandemic.

In addition to the continuing marked differences in unemployment rates between cantons, regions and individual characteristics such as migration status, there are also significant disparities in terms of educational attainment (→ Figure 17). The following is worth noting: If one considers the unemployment rates with the highest educational qualifications, the difference has tended to increase over the last two decades, but only with regard to persons without a non-compulsory education.

In an international comparison with other industrialised countries, Switzerland also performs well in terms of youth unemployment. Even according to the criteria of the International Labour Organisation (ILO), the youth unemployment rate in the first quarter of 2025 was only 1.7 times the average unemployment rate. It was thus well below 2.4 times, the corresponding value for the EU area (→ *margin text*).

Unemployment rates

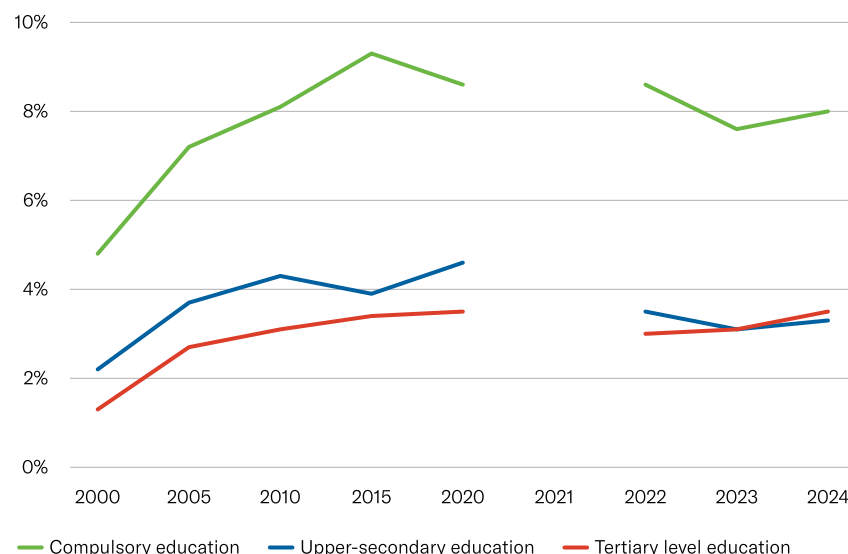
Unemployment is calculated in two different ways in Switzerland. On the one hand, according to the unemployment rate of SECO, which is based on register data from the Regional Employment Service Centres, and, on the other hand, on the survey data according to ILO specifications published by the FSO. The rates of the survey data are always two times higher than those of the registered unemployed. This is particularly distinct where youth unemployment is concerned, where the rate for 2024 was 2.3% according to SECO, but 8.2% according to ILO criteria.

Due to the changed survey method, there is a break in the time series in the years 2010 and 2021. In 2010, the survey was changed to a quarterly basis and the questionnaire was adapted. The results for 2021 will not be published as the adjustments to the survey method were introduced gradually over the course of 2021 and had not yet been implemented for all survey quarters at the time of evaluation.

17 Unemployment rate by education level, 2005–2024

Unemployment rate according to the ILO (25- to 64-year-olds); only 25- to 64-year-olds are shown, as younger people often have not yet completed their education and the over 64-year-olds are usually no longer in employment.

Data: FSO

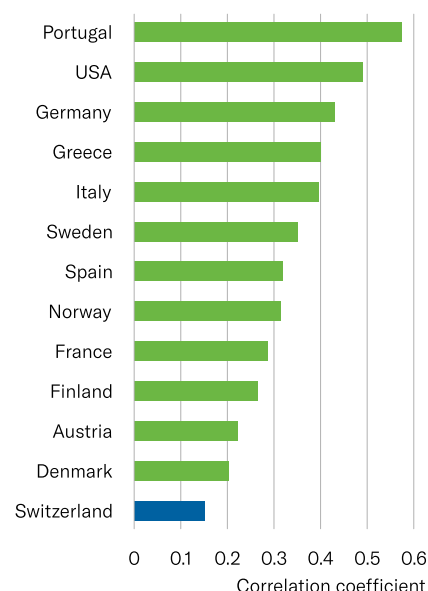


Income mobility

18 Correlation of income of siblings

International estimation results

Data: Bühler et al. (2025)



The situation on the Swiss labour market, which has been stable for several decades, is characterised by continuous employment growth and very high employment rates compared with other countries. Together with the high-performing education system, it contributes to strong income mobility. This can be measured in both the horizontal and vertical dimensions. The latter measures the correlation between the income positions of parents and their children. A high correlation indicates low intergenerational mobility, while a low correlation indicates better opportunities for advancement regardless of social background. Horizontal income mobility, on the other hand, relates to the correlation of the incomes of siblings. A low correlation suggests a lower impact of family background on later income and a greater significance of individual factors. If both the vertical and the horizontal correlation are low, this indicates that there is a fair chance of shaping a career largely independently – not influenced by parent's background and resources. New calculations by Bühler et al. (2025) show that Switzerland has the lowest value in an international comparison in terms of both intergenerational income elasticity and the income correlation amongst siblings (→ Figure 18).

Technological change and the challenge posed by AI

In recent decades, technological change has been a key driver of educational expansion in most industrialised countries – including Switzerland. Increasing automation and digitalisation have above all led to the substitution of routine activities of both a manual as well as a cognitive nature. As a result, the proportion of cognitive non-routine activities steadily increased

in importance in the labour market (*Gschwendt, 2022*). These generally required education of a higher and better quality, which was reflected in the marked increase in tertiary-level qualifications and the associated tertiarisation of the labour market.

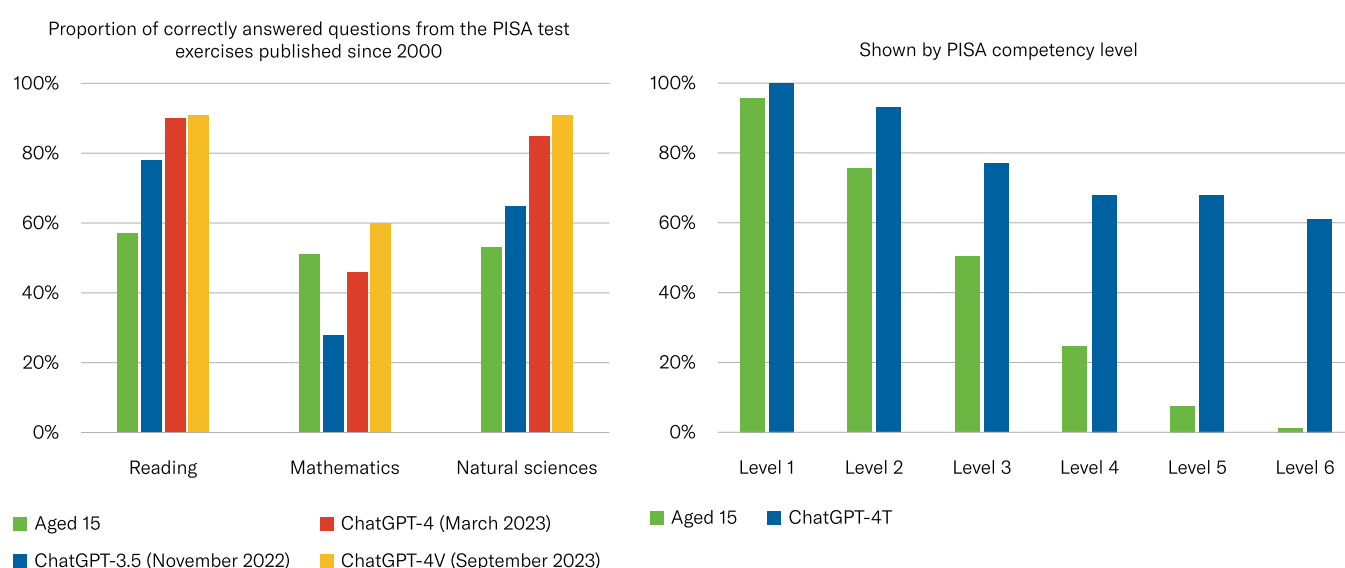
However, the emergence of high-performance generative AI systems, especially large language models (LLMs) from the end of 2022, brought a potential paradigm shift. These technologies are capable of handling complex cognitive tasks that go far beyond mere knowledge queries and involve sophisticated problem solving. The dynamics and performance of such systems can be traced using OECD tests, in which, since ChatGPT was published, different versions of the AI program have been confronted with PISA tasks.

Two key observations have been made: Firstly, significant progress in performance between the individual model generations can be established within a very short period of time. Within just a few months, the ChatGPT platform was not only able to further expand its superiority in the area of reading compared to average pupils, but also to reverse its initial deficit in mathematics into a lead (→ Figure 19, left). While the average 15-year-olds complete around 50 to 60% of PISA tasks correctly, ChatGPT achieves a success rate of 90% in the areas of reading and natural sciences and 60% in mathematics.

Secondly, it is striking that the model delivers over 60% correct answers on average even at the highest skill levels, in other words, at competence levels at which between 1 and 8% (at competence level 6 or at competence level 5) of the young people tested solve tasks correctly (→ Figure 19, right). Even if real life does not consist of PISA tasks, longitudinal analyses show that the skills measured with PISA at the age of 15 are highly predictive of later educational and employment trajectories.

19 Problem-solving skills of AI and 15-year-olds by test domains in PISA

Data: OECD



Thus if AI systems not only outperform the average, but also outperform the best-performing pupils, this has profound implications for education and the labour market. On the one hand, access to such technologies opens up substantial productivity gains, as most people cannot complete cognitive tasks in the same quality or at the same speed without AI support – which creates a complementary relationship between humans and machines. On the other hand, there is also the risk that certain activities will be taken over entirely by AI, which will lead to human labour being substituted.

The extent of this substitutability will ultimately determine which professions are at risk in the future and could potentially be partially or fully replaced by AI. These developments present new challenges for both the education system and for labour market policy.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

**CONTINUING EDUCATION
AND TRAINING**

COMPULSORY EDUCATION

CROSS-CUTTING THEMES

Organisation of compulsory education

Primary level and lower-secondary level together form the stage of compulsory schooling in Switzerland. Primary level includes pre-school or the first two years of a first learning cycle, which are assigned to ISCED level 020 (*pre-primary education*) according to the International Standard Classification of Education . School years 3 to 8 fall under ISCED Level 1 (*primary education*), while lower-secondary education, comprising school years 9 to 11, corresponds to ISCED Level 2 (*lower secondary education*). Compulsory education lasts eleven years and is divided into three cycles (→ Figure 20).

20 Organisation of compulsory education

Data: EDK-IDES

School years		1	2	3	4	5	6	7	8	9	10	11
Level designation		Primary school level								Lower-secondary education		
Lehrplan 21		Zyklus 1				Zyklus 2				Zyklus 3		
Plan d'études romand		Cycle 1				Cycle 2				Cycle 3		
Piano di studio		1° ciclo (1° anno Scuola dell'infanzia facoltativo)				2° ciclo			3° ciclo			

21 Compulsory education in figures, 2023/24

Public schools; in the case of special needs education staff, the public and private institutions are taken into consideration.

Data: FSO

Numbers of pupils, 2023/24	
1 st –11 th school year total	1,024,182
1 st –2 nd school year	1,845,39
3 rd –8 th school year	5,538,51
9 th –11 th school year	2,857,92

Staff (FTE) 1 st –11 th school year, 2023/24	
Teaching staff	66,121
Special education staff	12,765
School management	3,592

Public education expenditure in CHF million, 2022	
Total education expenditure	42,574
Compulsory education (including special schools)	21,727
Teacher salaries in compulsory education (including special schools)	11,749

With 1,024,182 pupils (school year 2023/24), 59% of the entire pupil population – from the start of primary to tertiary level – is in compulsory education. 93.8% of children and young people attend school in a public institution, 4.5% in a private institution without state subsidies and 1.7% in a private institution with subsidies (→ *Private school*, page 56). Of the 1,024,182 pupils, 1.3% attend classes in a special needs class and 2% in a special school class (→ *Distributed to different types of schooling*, page 48). Corresponding to the high number of pupils in compulsory education, 66,121 teachers worked in state schools in the 2023/24 school year in full-time equivalents (FTEs), which corresponds to 1,044,22 people in absolute numbers (→ Figure 21). Given the large number of pupils (including special schools), about 51% of all state education expenditure is accounted for at this level.

Developments and scenarios for compulsory education

Since 2011, the number of pupils in compulsory education has risen steadily. The scenarios of the Federal Statistical Office (FSO) show a clear paradigm shift for the period from 2025/26 to 2034/35–particularly with regard to primary school level. This is due, among other things, to the fact that birth rates fell by around 12.7% on average between 2021 and 2024 following the brief peak in births immediately after the pandemic (*FSO, 2025b*). From 2026/27, this decline will have a significant impact on pupil numbers in the 1st to 8th school year at primary level. In the reference scenarios for the 1st and 2nd school year at primary level, there is already a decline of around 9.2% in Switzerland as a whole from 2025/26 to 2034/35. In the 3rd to 8th school year, it is somewhat more moderate at 5.8% (→ Figure 22).

On the other hand, growth is still forecast in the reference scenario for lower-secondary education, albeit to a lesser extent than in previous years. An increase of 5.9% is expected between 2025/26 and 2034/35—in the period 2021/22 to 2031/32, growth was still forecast at 9.8%. Cantonal scenarios continue to vary widely (→ *chapter Primary school level, page 59*; → *chapter Lower-secondary education, page 85*).

Pupil numbers are influenced not only by births, but also by immigration and emigration. Since 2023, the immigration statistics of the Federal Statistical Office (FSO) have registered record numbers of refugees, including many school-age children, due to Russia's war of aggression against Ukraine. Depending on the canton, these are integrated into admission classes or existing classes (*Kanton Bern, 2023*; *Kanton Zürich, 2021*). As no nationwide data on school-age refugee children in compulsory education was yet available in 2024, no conclusions can be drawn about their educational pathways or the distribution among the cantons. In future, the Federal Council intends to make more targeted use of existing data on refugees' school skills as an information basis for managing integration policy and for individual support for refugees (*Federal Council, 2024*).

Education pathways in compulsory education

Since 2012, the individual educational paths of pupils have been traced using individual data during their compulsory education. As the first cohort, children who started primary school in 2012/13 can be monitored over the entire eleven years up to the end of compulsory education (including pre-school or the first two years of a first learning cycle). Of these approximately 74,600 pupils, 89.5%¹ completed primary level without repetition. From the 3rd to the 8th school year at primary level, 6.5% had repeated one year and 1.3% had skipped one year. Just under 2.7% attended a special needs class or special school after the end of primary school. When and how often children from separate settings return to a mainstream class is considered in the chapters on primary school level and lower-secondary education (→ *chapter Primary school level, page 59*; → *chapter Lower-secondary education, page 85*). At lower-secondary level, a further 3.5% of repetitions² were recorded. After eleven school years, 85.2% of this cohort finally attended the 11th school year (mainstream class) in school year 2022/23. Around 10% had repeated at least once in total (→ *Figure 23*). The educational pathways of the hitherto observable cohorts in compulsory education (3rd–11th school year) have relatively constant shares of linear educational paths and repetitions.

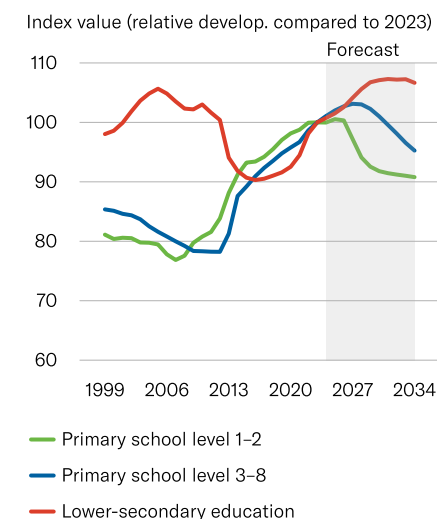
¹ Around 2.2% of children with a linear education path attended an introductory class at the beginning of primary school level.

² Around 0.4% had already repeated a class once at primary school level.

22 Scenarios for the development of pupil numbers up to 2034

Compulsory education; reference scenarios;
Index value 100 = year 2023

Data: FSO; calculations: SCCRE

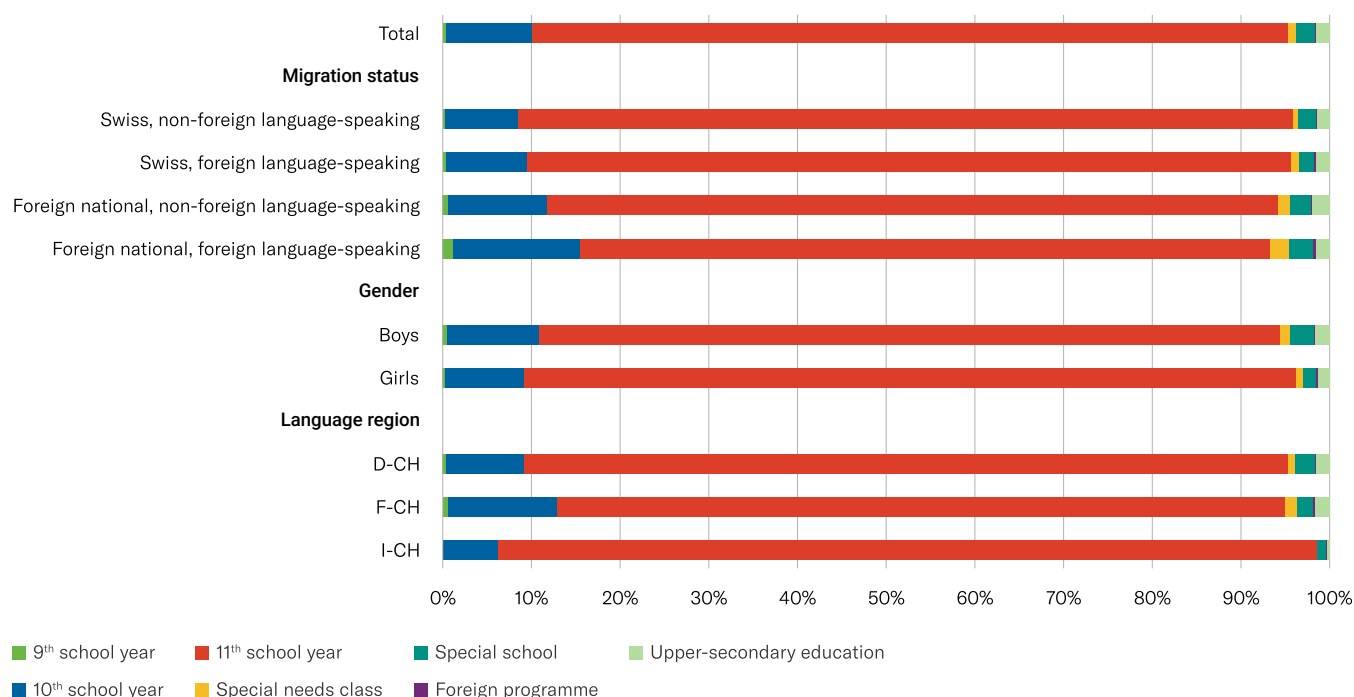


Until 2016/17, pupils in special schools and special needs classes were listed in the separate category "separative teaching". From the 2017/18 school year onwards, pupils in special schools and special needs classes will be integrated in the various levels of compulsory education and will no longer be listed separately.

23 Education pathways in compulsory education

Including private schools; description after 11 years, at the end of compulsory education; foreign language-speaking: First language does not correspond to the school language (language spoken in the school community).

Data: FSO (LABB); calculations: SCCRE



Cooperation between the federal government and the cantons

The Federal Constitution obliges the cantons to work together with the federal government to ensure high quality and accessibility of the Swiss Education Area.³ The instruments used to achieve this constitutional target include the joint education policy targets which are handled by the federal government and the cantons on a coordinated basis. The first education policy goal which concerns compulsory education specifies harmonisation of the following areas: the age of entry, compulsory schooling, the duration of education levels and the national education goals (*EAER & EDK, 2023*). However, cantons are responsible for harmonising compulsory education.⁴ They specified this constitutional mandate in the Intercantonal Agreement on the Harmonisation of Compulsory Education (HarmoS Agreement) (*EDK, 2007*) and have already evaluated it twice (*EDK, 2019a*). By 2010 – one year after the agreement came into force – fifteen cantons had joined. The composition of the acceding cantons has not changed since this time.

In the French-speaking cantons and the canton of Ticino, the Conférence intercantonale de l’instruction publique et culture de la Suisse romande et du Tessin (CIIP) ensures better cooperation and implementation of the requirements of the HarmoS Agreement. The CIIP sets various focal points over an administrative period. Topics such as digitalisation, education for sustainable development and integration in the education system

³ Art. 61a para. 1 Federal Constitution (FC).

⁴ Art. 62 para. 1 FC.

will have priority for the 2024 to 2027 period of activity (*CIIP, 2024a*). The German-speaking counterpart to the Regional Conference of Western Switzerland and Ticino was the Swiss German Conference of Ministers of Education (D-EDK), which dissolved at the end of 2018. This was an amalgamation of the regional conferences of Eastern, Northwestern and Central Switzerland as well as the Principality of Liechtenstein. However, following the dissolution, the three regional conferences and the Principality of Liechtenstein will continue to coordinate certain topics (such as the competence centre Lehrplan 21, educational television) (*D-EDK, 2018*).

Harmonisation of curricula

According to the HarmoS Agreement, the language regions are also tasked with harmonising curricula.⁵ Since 2022/23, the introduction of regional language curricula has been completed in all cantons. In the French-speaking regions, the Plan d'études romand (PER) was gradually introduced as early as 2011/12. The introduction of the Ticino curriculum (Piano di studio della scuola dell'obbligo ticinese) and Lehrplan 21 was also launched in 2015/16. However, the majority of German-speaking cantons only started introducing Lehrplan 21 in 2017/18 or 2018/19. This process did not follow a standard format in all cantons. Barely a quarter of the cantons implemented the curriculum simultaneously following a preparatory phase in all cycles. In most cantons, however, the introduction process took longer, as the curriculum was introduced in stages for each cycle.

In French-speaking Switzerland, a new version of the Plan d'études romand curriculum was published in 2021, providing for digital education as an independent discipline. Digital education now consisted of three areas: Media (*Médias*), IT (*Science informatique*) and Application (*Usages*) (*CIIP, 2024c*). Education for Sustainable Development (ESD) was redesigned in the Ticino curriculum (→ *Education for sustainable development, page 43*). An actual impact analysis of the Plan d'études romand curriculum or the Piano di studio has not yet been possible due to ongoing development. The introduction process and framework conditions can be voluntarily evaluated in German-speaking Switzerland. At the time of the 2023 Education Report, some cantons (such as St. Gallen, Zug) had already drawn up evaluation reports on the introductory phase. Since then, new evaluations have been carried out in various cantons (such as Grisons, Uri, Thurgau). Implementation in the cantons of Zurich, Bern and Lucerne was also evaluated, with the focus on the actions of the education administrations (*Kuratle, 2024*).

Unlike German-speaking Switzerland, the Regional Conference of Western Switzerland and Ticino, the CIIP, approved clear guidelines for the teaching resources (moyens d'enseignement romands [MER]). There is usually one teaching resource per subject and level. The school language is an exception: Here, there is a choice between two teaching resources (*CIIP, 2024b*). In German-speaking Switzerland, the cantons determine the teaching resources themselves to a large degree. In 2023, the Intercantonal Centre for Teaching Resources (ilz) published its third evaluation on the situation of teaching resources in German-speaking Switzerland. This showed

Assessing the cantons' harmonisation efforts

In 2015 and 2019, the Swiss Conference of Cantonal Ministers of Education (EDK) assessed the progress made in harmonising the structures and objectives of all cantons (*EDK, 2019a*). The second assessment showed that the greatest inter-cantonal differences continue to affect the first two school years of primary school level (→ *chapter Primary school level, page 59*). The third review of the cantons' harmonisation efforts is planned for 2026.

⁵ Art. 8 HarmoS Agreement.

that the mandatory use of teaching resources by teachers varied depending on the field of study: In cycles 2 and 3, it was high in most cantons in German, English, French, Italian, mathematics and NMG (Natural and Social Sciences), while in other subjects it was significantly lower (ilz, 2023).

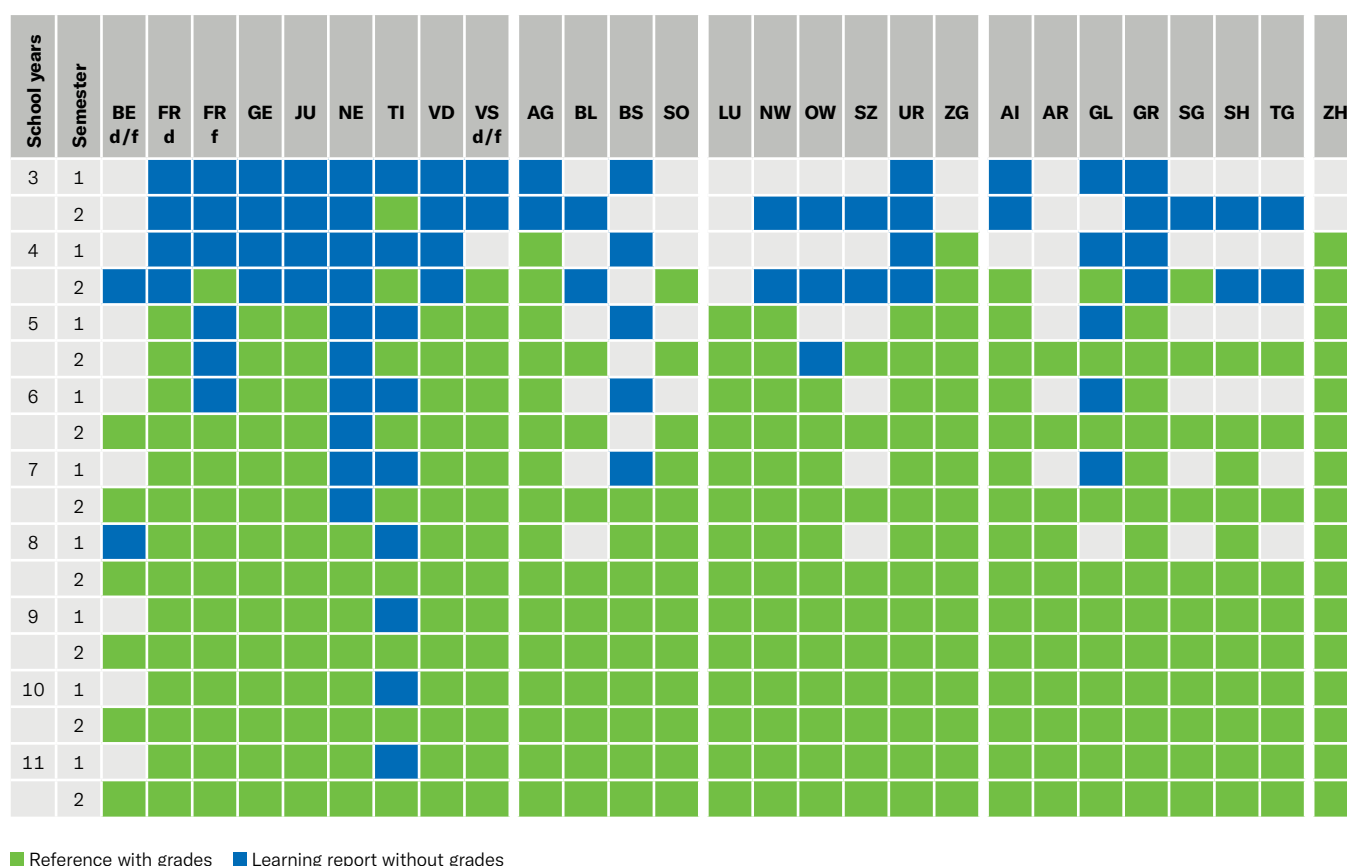
Cantonal regulations on grading

Academic performance in compulsory education is assessed using grades, assessment scales or learning reports. In pre-school (1st–2nd school year), the assessment is carried out without numerical grades. Observation forms are often used as instruments (EDK-IDES, 2024d). In the 3rd to 8th school year at primary level, children in just under half of the cantons receive a grade report twice a year. The other cantons differ in terms of the frequency with which grade reports are issued and the type of assessment (learning report without grades, certificates or other assessment procedures) (→ Figure 24). Lower-secondary education is more strongly standardised. With the exception of the cantons of Bern and Ticino, semester reports with grades are issued everywhere. In addition, most cantons conduct external competence tests during compulsory education.

24 Cantonal regulations on grading in compulsory education

3rd–11th school year; as of 2024. Grisons: In school years 3 and 4, the school governing body decides on the form of assessment (grade/word certificate).

Data: EDK-IDES



The debate about grades has been rekindled in a number of cantons. Pseudo-accuracy and lack of objectivity are cited as the disadvantages of grades. For this reason, projects focusing on alternative assessment methods are also being implemented in various cantons (Lopez, 2024; Roth & Ruf, 2024). Although various studies have shown that systematic biases can occur in grading (Gil-Hernández et al., 2024; Oggenfuss & Wolter, 2025; Zanolli & Petrucci, 2024), it cannot be assumed that alternative assessment methods without grades would be less susceptible to such biases (→ *chapter Lower-secondary education*, page 85). When it comes to grading, teachers also differ in terms of whether they are generally more stringent or less stringent. Various research findings on this are also available. They demonstrate that a stricter rating has a positive impact on the motivation of both strong and weaker pupils (Balkis et al., 2016; Gershenson et al., 2023; Ilter, 2023; Lievore et al., 2024). Significantly higher objectivity in the assessment and comparability of performance could be achieved by means of standardised cross-school competence tests (for example, by using a survey to review of the national education objectives [ÜGK]).

Review of school and teaching quality

The Federal Constitution and cantonal legislation state that the actors at the various levels of the education system are accountable for delivering a high quality of education in line with their responsibilities.⁶ In the German-speaking cantons, this is predominantly ensured by a combination of internal school quality management (such as employee evaluations by the school management and peer feedback), external school evaluation as well as school supervision (by inspectorates or specialist education units) (SCCRE, 2023). The information provided based on the external evaluations serves as a basis for accountability to the cantonal authorities, but can also be used as a basis for further developing their school and lessons. As the PISA 2022 school survey showed, 46% of the schools surveyed at lower-secondary level conducted mandatory external evaluations. In 11%, external evaluations were voluntary and carried out solely on the initiative of the school. Altogether, almost half of the schools with a mandatory external evaluation reported that the results of this measure had led to changes.

In recent years, several cantons have realigned their external evaluation. For example, they are now conducting focus evaluations in which specific quality areas such as integrative schooling or the implementation of curriculum 21 are evaluated (→ *chapter Primary school level*, page 59). Other German-speaking cantons (such as St. Gallen, Schaffhausen, Schwyz) have suspended the third-party evaluation and limited themselves, for example, to checks by the school supervisory authorities (argev, 2023). The type of external evaluation also differs between German-speaking and French-speaking Switzerland. In the cantons of Western Switzerland, there are other measures which ensure that the system is monitored and reviewed. These can be compared with the focus evaluation (Neuchâtel) or the cantonal school supervisory authority (Geneva, Vaud). However, the focus is on cross-school competence tests (*épreuves de référence, épreuves communes, épreuves certificatives*). These formative tests are used widely. In addition to assessing

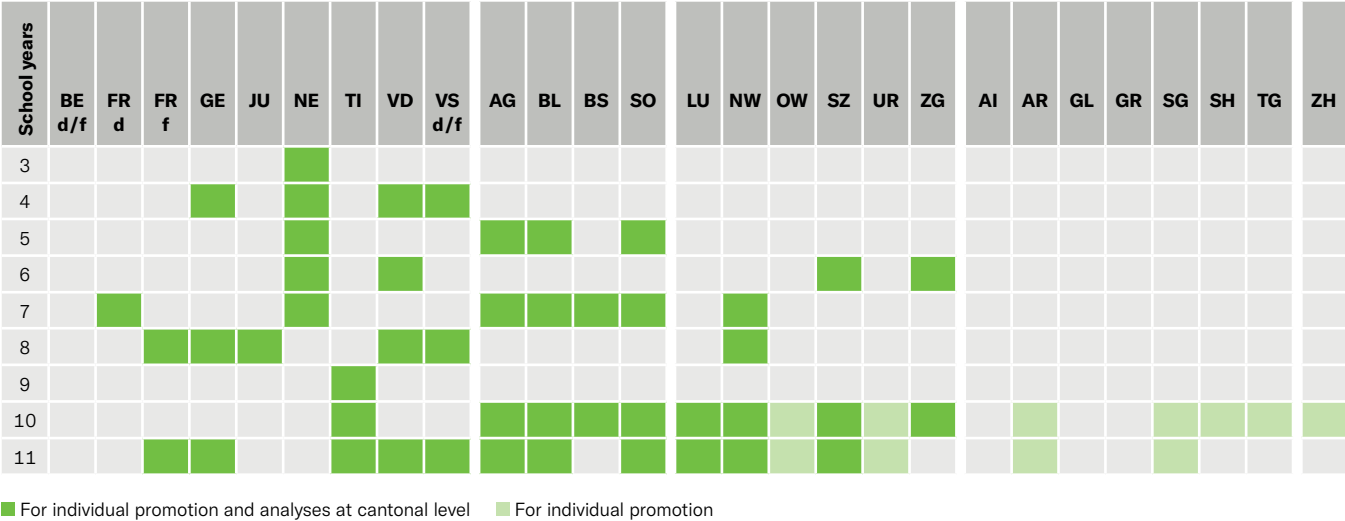
⁶ Art. 61 a para. 1 and 2 FC.

and supporting the individual situation, they also serve to ensure and develop the quality of the schools (*Kanton Waadt, 2022; Denecker et al., 2024*). External bodies are responsible for evaluating the results and, in some cases, conducting the tests (*EDK-IDES, 2024e*). In addition, an item database was created with EpRoCom (Épreuves romandes communes/Banque d’items) based on the curriculum in French-speaking Switzerland. Thanks to EpRoCom, teachers have a uniform basis for evaluating pupils.

Since the 2013/14 school year, the cantons of Northwestern Switzerland (Aargau, Basel Stadt, Basel Landschaft, Solothurn) have also been conducting cross-school competence tests, known as “checks” (*IBE, 2023*). Other cantons in Central and Eastern Switzerland use similar tests (such as “Stellwerk”) or orientation and reference tests such as “Lernlupe” or “Class cockpit” (→ Figure 25). Pupils, teachers, school management and – in a good half of the cantons – the cantonal authorities as well – receive target group-specific evaluations (*EDK-IDES, 2024e*).

25 Compulsory learning assessment

Status 2024
Data: EDK-IDES



Overall, there is a great deal of diversity between the cantons. For example, the absence of cantonal competence tests is not compensated by external evaluations or vice versa. In addition, the results of this large number of cantonal surveys and checks of school quality cannot be used systematically in all cantons. This, combined with the lack of uniformity of assessment procedures, makes comparability and transparency in the education system difficult.

Reviewing of the national educational objectives (ÜGK)

The survey for review of the national education objectives (ÜGK) also plays a key role in ensuring the quality and effectiveness of the education system. It makes it possible to assess the status of harmonisation⁷ and compliance with the national education objectives⁸ as well as to determine the extent to which pupils achieve the defined basic skills in the various subjects. Since 2016, achievement of the basic skills has been reviewed four times as part of the corresponding performance survey. The results of the first two surveys were already addressed in the 2023 Education Report (SCCRE, 2023; Konsortium ÜGK, 2019a, 2019b). The results of the third survey in 2023 on school and foreign language-speaking skills in the 11th school year have been included in this education report (→ chapter Lower-secondary education, page 85). The results of the fourth survey in 2024 on basic competencies in school language and mathematics in the 4th school year at primary level were not yet available at the time of reporting. Following a decision by the EDK in 2023, testing will be continued in a four-year cycle from 2028 onwards as a “monitoring of basic skills”. Each cohort will be tested in the 8th and 11th school year. The first cohort is scheduled to take part in the study (→ Figure 26) in 2028 and 2031. Each survey examines the fields of study of school language and mathematics as well as the first and second foreign language. The new monitoring of basic skills makes it possible to map the entire range of services and to make performance developments visible (EDK, 2024).

26 Reviewing achievement of the basic skills

Status September 2024

Data: EDK

School year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
11 th school year	PISA	ÜGK L1 L2 L3		PISA				PISA		ÜGK L1 L2 L3 Maths	
8 th school year							ÜGK L1 L2 L3 Maths				ÜGK L1 L2 L3 Maths
4 th school year			ÜGK L1 Maths								
Publication of Swiss Education Report		Yes			Yes				Yes		

L1 = teaching language; L2 = first foreign language; L3 = second foreign language; Maths: Mathematics

⁷ Art. 62 para. 4 FC.

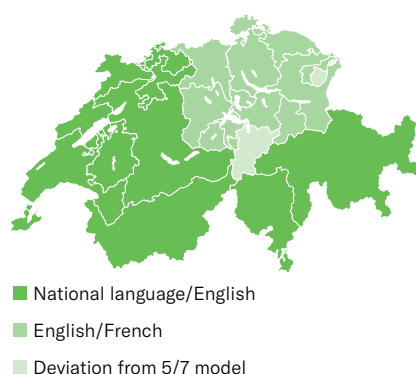
⁸ The educational goals define what all pupils must be capable of at the end of the three cycles in mathematics, school language and natural sciences. For foreign languages, educational goals have only been defined for cycles 2 and 3 (EDK, 2011).

The HarmoS cantons are obliged to support the voluntary **native language and culture education**, provided this guarantees religious and political neutrality (EDK, 2007). Sponsoring bodies such as embassies or associations are responsible for the organisation and financing. Native language and culture education is enshrined in law in nineteen cantons, but quality checks and the neutrality requirement are rarely institutionalised. Some cantons such as Basel Stadt and Zurich have a recognition procedure for sponsoring bodies (EDK-IDES, 2022).

27 Implementation of models 5/7

Status July 2025

Data: EDK-IDES



AI: English is taught from the 5th school year, French from the 9th school year.

UR: English is taught from the 5th school year, French from the 9th school year, Italian in the 7th and 8th school year as a compulsory elective subject.

TI: There is an exemption rule for three foreign languages as compulsory subjects: French from the 5th school year, German from the 9th school year and English from the 10th school year.

Language teaching

For the field of language teaching, the EDK's national language strategy (EDK, 2004) set out the most important benchmarks, which form the basis for the corresponding article in the HarmoS Agreement (EDK, 2007) and for the Federal Act on the National Languages and Understanding between the Linguistic Communities⁹. The strategy includes supporting the local national language at all school levels as well as supporting a second national language and another foreign language as part of compulsory education. The strategy also focuses on promoting the first language of pupils with a migration background through teaching in their native language and culture (HSK) and promoting language exchange between different language regions. In most cantons, support of the local national language begins before starting school and thus falls within the scope of early support (→ *chapter Primary school level*, page 59). This task is primarily the responsibility of the cantons and municipalities, which is why the distribution and anchoring of the offers varies widely. Most cantons have now developed an early childhood policy strategy that also includes language support (Federal Council, 2021; Vogt et al., 2022).

To support school exchanges between different language regions, the federal government and the cantons decided in 2017 that all young people should take part in an exchange at least once during their education (EAER et al., 2017). In 2023, this was confirmed as a common education policy goal for all levels of education (EAER & EDK, 2023). The only national survey with representative data from nineteen cantons showed that 4% of classes took part in regional language exchange activities in 2019, with these activities almost exclusively limited to lower-secondary education classes (11%). The evaluations focused on the class exchange. Unlike individual exchange programmes (→ *chapter Baccalaureate school*, page 151), the class exchange is an offer for the entire class and does not represent a selection of specific pupils (Albiez & Wolter, 2021).

The harmonisation of foreign language teaching has largely been implemented in 24 cantons. These cantons follow the 5/7 model, with the first foreign language being introduced from the 5th and the second from the 7th school year (→ Figure 27).¹⁰ A causal analysis of the staggered introduction of the second foreign language at primary level throughout Switzerland shows that the reform has no negative impact on the education path after compulsory education for more than 83% of pupils. Foreign language-speaking boys in classes with basic requirements were found to have a slightly reduced probability of a direct transition to upper-secondary education (Strazzeri et al., 2025).

For both foreign languages, the national education goals stipulate that an equivalent level of competence should be achieved by the end of compulsory education (EDK, 2019a). In 2017, the basic skills in the school language and the first foreign language at the end of primary level were checked for the first time with the review of the achievement of the basic skills (Konsortium ÜGK, 2019b). In 2023, achievement of the basic skills in the school languages and

⁹ Federal Act on the National Languages and Understanding between the Linguistic Communities (Languages Act [LangA]) of October 2007.

¹⁰ In the cantons of Appenzell Ausserrhoden, St. Gallen and Zurich, the cantonal council approved the postponement of French lessons to lower-secondary education (as of September 2025). In other German-speaking cantons, parliamentary proposals for French lessons at primary level were pending.

the two foreign languages was reviewed at the end of compulsory education (→ *chapter Lower-secondary education, page 85*). In addition to regular foreign language tuition, Switzerland offers around 400 bilingual or immersive courses in which a subject is taught wholly or partly in a foreign language (→ *chapter Baccalaureate school, page 151*). Around 20% of these courses are at compulsory education level, 12% at primary level and 7% at lower-secondary level. However, these courses are only attended by around 1% of pupils in compulsory education. The programmes are predominantly offered in multilingual cantons as well as in regions at the language borders, most often with German and French as immersion languages (*Elmiger et al., 2022*).

Education for sustainable development

The promotion of education for sustainable development (ESD) is part of Switzerland's public education mandate. It is closely linked to international commitments such as the 2030 Agenda of the United Nations. The seventeen Sustainable Development Goals (SDGs), in particular SDG 4 (→ *margin text*), form the framework for education for sustainable development (*DUK, 2017; United Nations, 2015*). Switzerland is also implementing the strategy of the United Nations Economic Commission (UNECE) and shows in the fourth evaluation report which institutions are responsible for implementing education for sustainable development and how the skills required by teachers are strengthened (*UNECE, 2024*).

The topic is implemented as part of a holistic approach that integrates all dimensions of school life, known as the “*Whole School Approach*” (*éducation21, 2023; Federal Council, 2023; DUK, 2021*). In curriculum 21 and Plan d'études romand, education for sustainable development is therefore not a separate field of study, but incorporated into many subjects as an interdisciplinary educational concept. This also applies to the new Piano di studio, which follows a similar logic to the curriculum in French-speaking Switzerland but uses the term “strong sustainability”. This emphasises the interdependence of environment, society and economy and points to the natural boundaries within which the economy and society must regulate each other (*Federal Council, 2023; Repubblica e Cantone Ticino, 2022*).

Éducation21 – the national competence centre for education for sustainable development – supports teachers and schools in implementing the topic of sustainability. The Strategy 2025–2028 focuses, among other things, on examining and bundling offers and expanding the Schulnetz21 network (*éducation21, 2025*). Based on these existing networks, their anchoring in the regional language curricula and cantonal sovereignty, a report by the Federal Council in response to postulate 19.3764 concluded that the introduction of a national action plan was unnecessary (*Federal Council, 2023*).

The **Agenda 2030** defines SDG 4 as the goal of ensuring inclusive, equal and high-quality education as well as promoting lifelong learning for all. Children, young people, adults and the poorest and most disadvantaged groups in particular should have access to high-quality basic and vocational education and training (*FDFA, 2020*).

Mixed-age classes

A mixed-age class is when pupils from at least two different school years are taught in one class (Cornish, 2006; Lindström & Lindahl, 2011).

Mixed-age learning

The pupils are intentionally taught in a mixed-age group. The older children can explain subjects to the younger ones and the younger ones have the older ones as a role model. In a mixed-age class, each child plays both roles once (Cornish, 2006; Lindström & Lindahl, 2011).

Mixed-age learning

Mixed-age classes have long existed as a possible form of instruction in Switzerland. As early as the 1980/81 school year, 22.8% of primary school classes were mixed in age (EDK, 1983). In recent years, focus on the topic has increased – among other things due to the entry into force of the Har- moS Agreement. The reasons for mixed-age groups are manifold, with demographic conditions being cited most often. In rural areas with low population density, there are often not enough children in one year to form their own class. Classes are therefore merged and run on a mixed-age basis. In urban areas, on the other hand, educational reasons are often pivotal. Here, a conscious decision is made to implement mixed-age classes in order to benefit from the educational advantages (Lindström & Lindahl, 2011; Veenman, 1995). One example of this are those cantons that offer mixed-age teaching at primary school level with an elementary or basic level (Vogt et al., 2010) (→ *chapter Primary school level*, page 59).

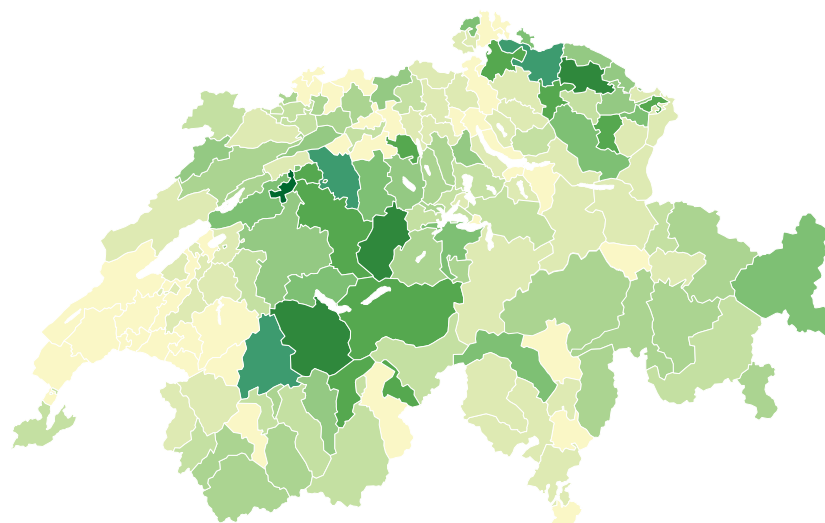
The longitudinal analyses conducted by the FSO now make it possible to examine the mixed-age classes at national and cantonal level according to various characteristics. In the 2022/23 school year, for example, 16.6% of pupils in compulsory education were taught in mixed-age classes. The distribution of mixed-age classes in compulsory education varies widely between the cantons. The cantons of Nidwalden (34.3%), Bern (39.3%), Thurgau (44.5%) and Appenzell Ausserrhoden (45.4%) accounted for over 30%. At the lower end of the scale were Basel Stadt (1.9%), Vaud (3.5%) and Schaffhausen (5.7%). However, the biggest difference can be seen between the levels of education. At primary level, 23.6% of pupils are taught in mixed-age classes (→ Figure 28), while at lower-secondary level it is only 2.1%.

These differences can be attributed, amongst other things, to the fact that elementary and basic levels are established at primary level, while at lower-secondary level it is more difficult to teach subjects such as German and mathematics on a mixed-age basis (Müller et al., 2011). At primary level, the share of pupils in mixed-age classes fluctuates between 2.7% (Basel Stadt) and 63.9% (Thurgau). Several cantons do not have mixed-age classes at lower-secondary level (→ Figure 29). Amongst the cantons with mixed-age classes, the canton of Bern has the highest share with 11.0% at lower-secondary level.

28 Mixed-age classes at primary level, 2022/23

3rd-8th school year; without private schools, special schools and special needs classes

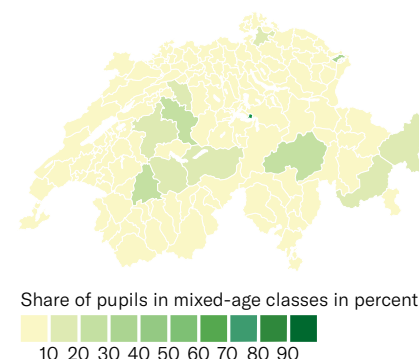
Data: FSO (LABB); calculations: SCCRE



29 Mixed-age classes in lower-secondary education, 2022/23

Without private schools, special schools and special needs classes

Data: FSO (LABB); calculations: SCCRE



Special needs education

Switzerland has enshrined the principles of the Salamanca Declaration on the inclusion of children with disabilities in the mainstream education system in law in the Disability Discrimination Act¹¹. Since then, the educational policy premise “Integration before separation” has applied. As part of the new system of fiscal equalisation and division of tasks (NFE) in 2008, the cantons assumed full responsibility for the compulsory education of children and young people with disabilities or impairments aged between 0 and 20. To fulfil this constitutional mandate, they specified in the Special Needs Education Agreement a joint basic offering for the education and care of children and young persons with special educational needs and disabilities or impairments. Irrespective of their formal accession, however, all cantons were obliged under the NFE to adapt their legal bases and develop strategic special needs education concepts. Some cantons, such as Geneva, have already evaluated the implementation of the Agreement and the standardised assessment procedure (SAV) (*EDK, 2014b*). Amongst other things, the evaluation shows that the number of applications to conduct such a clarification procedure has increased since the implementation of the reform and that boys and foreign language-speaking pupils are over-represented (*Guilley et al., 2023*).

The special needs education statistics also laid the foundations for systematic monitoring of special needs education measures at national level. In the 2023/24 school year, around 3.9% of pupils in compulsory education had enhanced special needs education measures and 4.8% had an adjustment to the curriculum (*FSO, 2025e*). If pupils are prescribed a reduction in

¹¹ The Disability Discrimination Act (DDA) has been in force since 2004 and has been under partial revision since 2024.

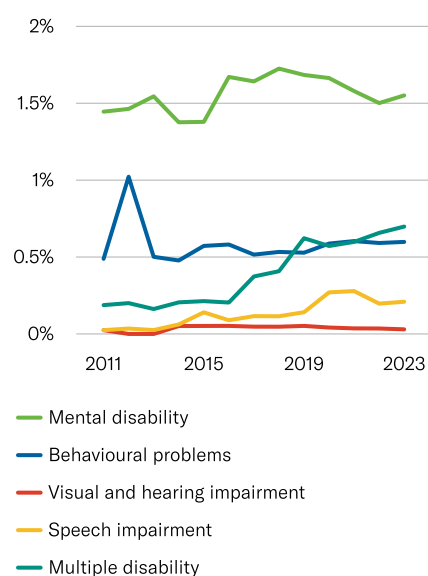
The **compensation of disadvantages** (NAG) is a measure for pupils with individual educational needs without adapting the curriculum status. No diagnosis from a specialised department is required. The NAG is agreed in writing and does not require an entry in the certificate (Kanton Bern, 2019; Kronenberg, 2021).

their learning objectives which is noted in their report, this reduces their chances of transitioning to more challenging types of school or apprenticeships (Greber et al., 2017; Sahli Lozano et al., 2021; Sahli Lozano, Wüthrich et al., 2023). Studies of primary and lower-secondary education also compare the measure “adapted learning objectives” with the measure “compensation of disadvantages” (→ *margin text*). The results indicate that reduced learning goals are associated with lower academic performance, while access arrangements tend to correlate positively with academic success (Sahli Lozano et al., 2022; Sahli Lozano et al., 2024; Kronenberg, 2021; Schmidlin et al., 2018). As the statistics for special needs education show, both the share of children with enhanced measures and that of children with adjusted learning objectives increased across Switzerland from 2017/18 to 2023/24 (FSO, 2025e). At the same time, the share of integrated children with enhanced measures in mainstream classes has steadily increased in recent years (→ *chapter Primary school level, page 59*).

30 Impairment in the canton of Grisons

Share of children with enhanced measures in special schools of compulsory education; 2010–2022

Data: Bista Grisons; calculations: SCCRE



The high share of children with a mental disability in the canton of Grisons can be explained by the fact that the figures refer exclusively to pupils in special schools. Diagnoses are only recorded for this group – but not for children with enhanced measures in mainstream or special needs classes.

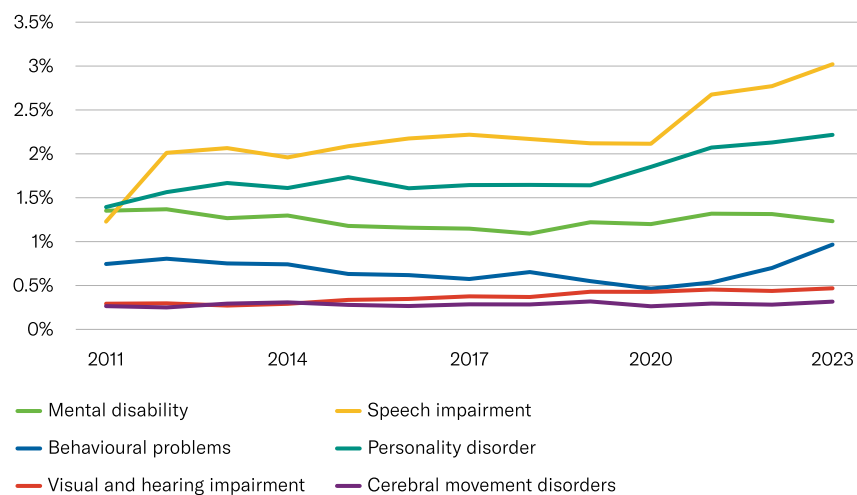
Integration in compulsory education

In 2024, around thirteen years after the Special Needs Education Agreement entered into force, integrative schooling was once again the focus of education policy debates in Switzerland. Popular initiatives in the cantons of Basel Stadt and Zurich as well as a national position paper from the ranks of the FDP¹² called for the reintroduction of support classes or even the abolition of the integrative school (*Komitee für eine freie Schule, 2024*). The discussion focuses on pupils with conspicuous behaviour (→ *margin text at the top of the next page*), as their actions require special attention and systematic pedagogical support. It is not possible to determine how the number of these children has developed in most cantons, as medical diagnoses are no longer recorded at federal level since the withdrawal of disability insurance from education. The cantons of Grisons and Vaud are exceptions, as they publish cantonal data on pupils with enhanced special needs education measures. In Grisons, there is no increase in the number of children with abnormal behaviour among pupils in special schools (→ Figure 30). In the canton of Vaud, the number of behavioural problems and personality disorders (e.g. psychosis or autism) is increasing amongst pupils with enhanced measures – regardless of the type of schooling (special school classes, special needs classes or mainstream classes) (→ Figure 31).

31 Diagnosed impairments in the canton of Vaud

Children with enhanced measures in special schools, special needs classes or mainstream classes of compulsory education; speech disorders: Speech dysfunction, severe dyslexia and speechlessness; personality disorders: Identification disorders such as psychoses and autism. As the allocation used in the graphic is difficult, the process for recording diagnoses will be changed in the near future; 2011–2023

Data: Canton of Vaud; calculations: SCCRE



If pupils with enhanced measures (1.7% nationwide) (→ *margin text*), were to be more strongly separated, this could lead to a significantly higher need for teachers in special schools (FSO, 2025e). This additional need would be exacerbated by the fact that the classes in special schools are smaller on average than in mainstream schools and the student-teacher ratio is lower (fewer pupils per full-time equivalent [FTE]). If, as part of a wider separation, not only were the class sizes in mainstream schools reduced, but classes merged and the freed up human resources transferred to special schools, there would be an additional need for teachers of 1.8% or 1,170 FTEs, respectively. If, on the other hand, all mainstream classes were continued on a smaller scale after these pupils had been removed, the demand would increase to 3.8% or 2,470 FTEs, i.e. to more than double. Part of this additional need could be met if some of the special needs teachers in schools who had previously worked in integrative settings were increasingly deployed in special schools. Calculated by canton, the required additional number of teachers indicate major differences (→ Figure 32). The different additional needs can essentially be attributed to three factors – the average student-teacher ratio in mainstream schools, the average class size in special schools and the share of integrated pupils with increased measures in mainstream classes.

The term **challenging or conspicuous behaviour** (also referred to as behavioural disorders) describes social and emotional difficulties that occur as a result of the situation – regardless of whether the child concerned has a recognised impairment or not. In contrast, disabilities or impairments can be diagnosed on an individual basis. They result from physical, cognitive and psychological impairments as well as chronic diseases (Kronenberg, 2021).

According to the FSO, **enhanced measures** relate to a specific pupil on an individual basis. They only qualify as enhanced measures if a standardised assessment procedure (SAV) or a comparable procedure has been conducted and the competent authority has issued a contestable ruling on the corresponding measures (FSO, 2025e). Enhanced special needs education measures do not mean the same in all cantons. They include, for example, psychomotoric therapy and speech therapy, support for visual, hearing and physical impairments or autism, as well as measures for highly gifted children (Kronenberg, 2021).

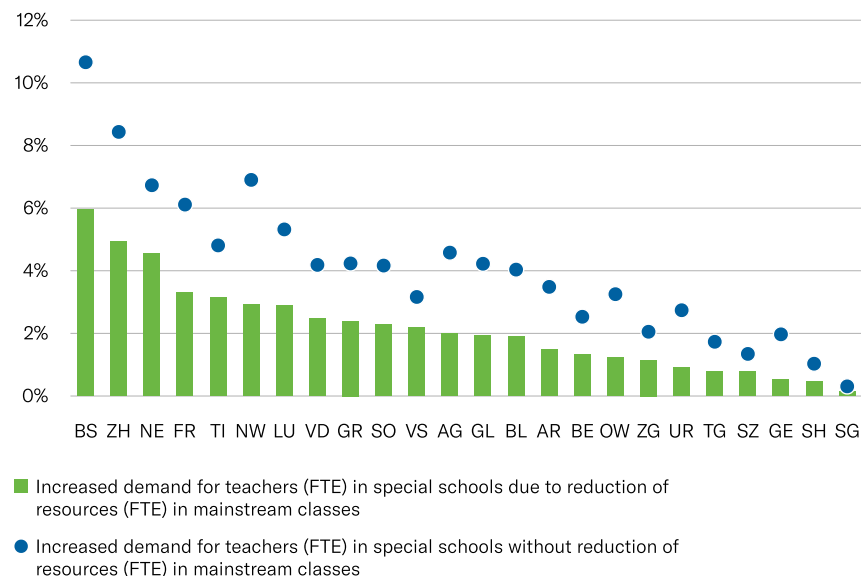
The **canton of Zurich** has an above-average number of integrated pupils with enhanced measures, an above-average student-teacher ratio in mainstream classes and, at the same time, small classes in special schools – which leads to a high demand for additional teachers (iFTE). If resources in mainstream schools were reduced and integrated pupils separated, almost 5% more teachers would be needed in special schools in the canton of Zurich. Without reducing the resources, the increase in demand would amount to 8.4%.

The **canton of Geneva** also has a high student-teacher ratio in mainstream classes, but with fewer integrated children/young people and above-average classes in special schools, which means that the need for additional teachers is lower. If resources in mainstream schools were to be reduced, around 0.5% more teachers in special schools would be needed in the canton of Geneva if integrated pupils were to be separated. Without reducing the resources, the increase in demand would amount to around 2%.

32 Increased demand for teachers (FTE) in the separation of previously integrated pupils with enhanced measures, 2022/23

Calculations are based on data for special and mainstream schools in compulsory education; excluding foreign programmes; only public schools taken into consideration as mainstream schools; Appenzell Innerrhoden and Jura: no information on enhanced measures

Data: FSO (LABB); calculations: SCCRE



There are various alternatives to separating integrated pupils – the redistribution of existing resources (such as prevention or low-threshold measures), the continuing education and training of teachers in the area of collaboration and multi-professionalism (*Savioz et al., 2023*), closer collaboration between special and mainstream schools (*Seifert, 2024*) or a more even distribution of children amongst mainstream classes with enhanced measures (*Dlabac et al., 2022; Sallin, 2022*). The extent to which these could be solutions for existing challenges remains open. This is particularly the case because the benefits of integrative support – such as strengthened peer relationships or higher academic well-being – have been empirically confirmed in numerous studies (*Balestra et al., 2022; Bless, 2018; Lütje-Klose et al., 2018; Sallin, 2022; Sermier Dessemontet et al., 2011*).

Distributed to different types of schooling

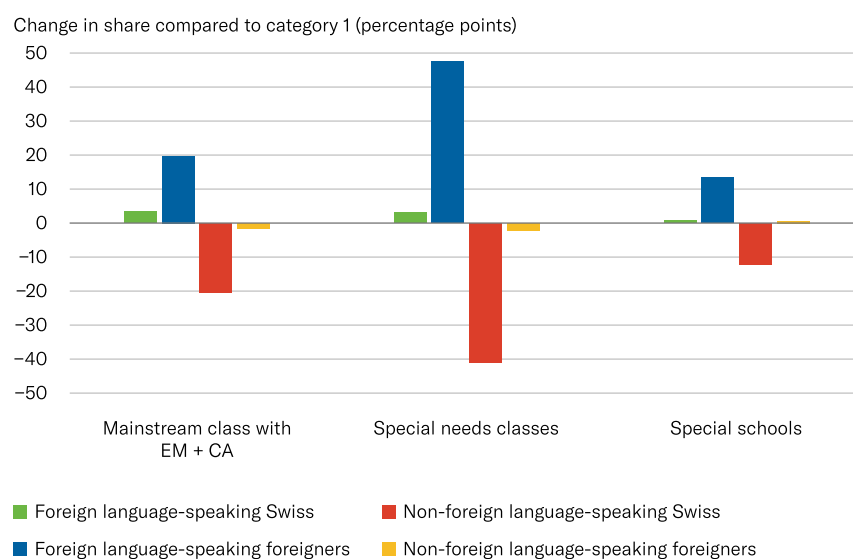
The modernised statistics on special needs education distinguish between the separate teaching types in special school classes, other special needs classes (support classes and small classes), and classes for foreign language speakers and introductory classes from school year 2017/18 (*FSO, 2025e*). In addition, pupils with enhanced special needs education measures and/or an adapted curriculum (adapted learning objectives in one, two or more main subjects) are also recorded (*FSO, 2019*). The measures and types of schooling in the special needs education statistics also yield fifteen different types of schooling (→ Figure 33). The majority of pupils are in mainstream classes, have simple or no measures and no curriculum adjustments. Their share has been between 93 and 94% (type 1) since 2017/18 and 93.2%

in the 2023/24 school year. In addition to schooling in a mainstream class without enhanced measures or curriculum adjustments, there are fourteen other types of schooling options for children with special individual educational needs. Just under 1% of pupils in special needs classes or special schools, for example, have no curriculum adjustments (types 7, 10 and 13). Foreign and foreign language-speaking pupils are strongly overrepresented, especially in special needs classes. They also have reduced learning goals more than twice as often as Swiss nationals. In contrast, the latter are most likely to be taught in a mainstream class with simple or without enhanced special needs educational measures and without curriculum adjustments (→ Figure 34). Overall, it is not only the migration background that plays a key role in allocation to the different schooling options, but also, above all, the first language. While this is understandable and intended in classes for foreign language speakers, for example, the first language should not play a role in the allocation in special schools.

34 Distribution amongst different types of schooling by origin and language, 2023/24

Based on data from special and mainstream schools in compulsory education; only mainstream schools taken into account for public schools; without foreign programmes; foreign language-speaking: First language does not correspond to the school language. The basic category is pupils in mainstream classes without adapted learning objectives (MC), with simple or no measures. Appenzell Innerrhoden and Uri: no information on enhanced measures (EM)

Data: FSO; calculations: SCCRE



Reading example

Foreign language-speaking foreigners are significantly overrepresented in the special needs classes compared to the basic category at 49 percentage points. In contrast, the proportion of non-foreign-speaking Swiss nationals in mainstream classes with enhanced measures (EM) and/or curriculum adjustments (CA) is 20 percentage points lower than in the basic category. Foreign language Swiss nationals are mainly pupils whose first language is a national language, but which does not correspond to the language used in school – for example, a French-speaking child in a German-speaking school.

33 Survey model special needs education statistics

Compulsory education; 2023/24 school year; no data is available for 3% of pupils (31,279).

Data: FSO; calculations: SCCRE

Class	Type	Measures	Curriculum	%
Mainstream classes	1	NSM	MC	93.18
	2	NSM	CA (1–2)	1.36
	3	NSM	CA (>=3)	0.52
	4	EM	MC	0.95
	5	EM	CA (1–2)	0.34
	6	EM	CA (>=3)	0.42
Special needs classes	7	NSM	MC	0.42
	8	NSM	CA (1–2)	0.15
	9	NSM	CA (>=3)	0.39
	10	EM	MC	0.14
	11	EM	CA (1–2)	0.03
	12	EM	CA (>=3)	0.12
Special school classes	13	EM	MC	0.39
	14	EM	CA (1–2)	0.28
	15	EM	CA (>=3)	1.32

NSM	No or simple measures
EM	Enhanced special needs educational measures
MC	Mainstream curriculum
CA (1–2)	Curriculum adjustment in 1–2 subjects
CA (>=3)	Curriculum adjustment in 3 or more subjects

Enhanced special needs measures: Measures defined by a standardised assessment procedure (SAV) or a comparable procedure that are characterised by, amongst other things, a long duration or high intensity (FSO, 2025e).

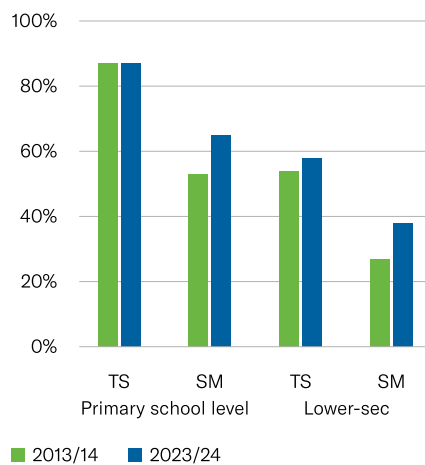
Simple measures: Temporary measures with less intensity and no radical consequences in day-to-day life. The list of simple measures also includes speech therapy, psychomotricity and supporting gifted pupils (Kronenberg, 2021).

Adapted curriculum: Adaptation of individual learning objectives if a pupil fails to achieve the minimum objectives of the regular curriculum over an extended period of time. The relevant subjects are school language, foreign language, mathematics and natural sciences (FSO, 2025e). There is no need for a diagnosis for individual learning objectives. However, a note is made in the reference (Kronenberg, 2021).

35 Gender of school staff

Share of women among teachers (TS) and school management (SM) in public schools of compulsory education

Data: FSO



Children who are supported with enhanced measures in the mainstream class also include children with special talents (intellectual giftedness). In most cantons, it is possible to support these children and young people individually in a mainstream class, which is referred to as internal differentiation (*EDK-IDES, 2024a*). New data on supporting gifted people in German-speaking Switzerland shows that this is more pronounced at primary school level than at lower-secondary level (*Meier et al., 2024*) and varies according to individual characteristics, such as Gender (*→ chapter Primary school level, page 59*).

School staff in compulsory education

Over the past ten years, the share of female teaching staff at both primary and lower-secondary level has hardly changed. The trend is different for school management. Here, the share of women has increased significantly at both levels. In primary schools, therefore, women are predominantly employed as school principals. At lower-secondary level, on the other hand, although around half of the teaching staff are women, the majority of the schools are still run by men (*→ Figure 35*). One reason for the high share of women among the staff in compulsory education is the scope for part-time employment (*→ chapter Universities of teacher education, page 269*), combined with guaranteed equality of salary. In other professions, on the other hand, part-time work often means wage disadvantages or at least limited career opportunities. According to research, a balanced gender ratio in the school team has a positive impact on school performance and the educational path of pupils, possibly as a result of complementary skills in the team (*Schaede & Mankki, 2022*). There are no clear results on the issue of whether the gender of individual teachers influences pupil performance (*Antecol et al., 2015; NaYoung Hwang & Fitzpatrick, 2021; de Gendre et al., 2024*).

On the one hand, the further development of compulsory education (integration, school-based day-care facilities and school autonomy) has led to schools employing staff with varying qualifications. On the other hand, various roles were differentiated in connection with the various specialists. In addition to teachers and special needs education professionals, auxiliary staff such as class assistants, senior citizens and persons on civilian service are increasingly being deployed.¹³ The regulations governing the employment and qualification of these support staff vary by canton and level (*EDK-IDES, 2024h*). However, there is no precise data and very little scientific research has been conducted on the use and benefits of classroom assistants. Initial studies show that assistants often take on teaching-related tasks, although their activities should be limited to administrative support (*Vogt et al., 2021*). International research indicates that the use of assistants is effective if they are specially trained and conduct systematic interventions. On the other hand, assistants who perform administrative tasks or preparatory work in regular everyday teaching have no positive impact on pupil performance (*EEF, 2025*). However, it is not possible to ascertain whether the

¹³ In 2023, 15% of all civilian service assignments were performed in schools (as a comparison: 15% of assignments were also in the healthcare sector, 10% in the area of environmental and nature conservation and 52% in the social sector) (*ZIVI, 2024*).

use of assistants has an impact on the perceived workload of teachers. In connection with the shortage of teachers, more and more persons without a teaching diploma are also being deployed in schools to work as class or specialist teachers. No precise figures are available on their use in the individual cantons. Most cantons only assign jobs to persons without a teaching diploma on a temporary basis and with a salary deduction. Only a few cantons make these appointments subject to compulsory training (→ Figure 36).

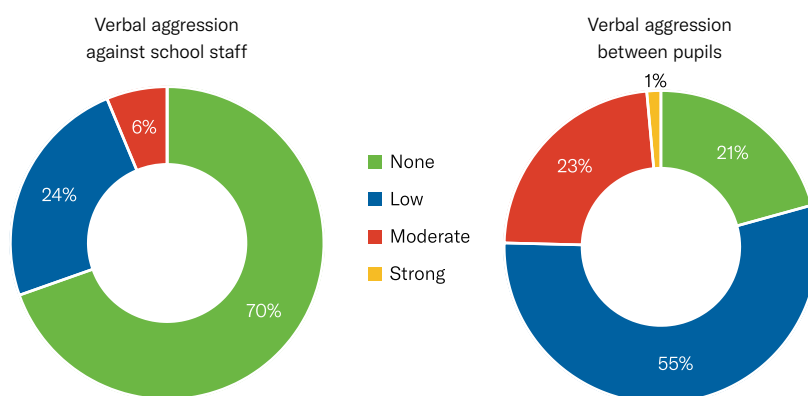
Violence against school staff

School staff can be exposed to various forms of violence and attacks in the workplace – either from pupils, parents or other persons in the school environment. Previous research and documentation focused predominantly on violence amongst pupils (*Gremion & Monney, 2021; Hrizi & Dutrévis, 2022*). Until recently, little information was available on violence against school staff. The 2022 PISA study provides information on this for Switzerland. At 30% of the schools surveyed, aggression against teaching staff is a minor to moderate problem. In contrast, aggression between pupils is a problem in 80% of schools (→ Figure 37). A survey on violence against teaching staff in German-speaking Switzerland revealed, amongst other things, that it was most often perpetrated by parents or guardians (→ Figure 38).

37 Verbal aggression at lower-secondary level schools

Results from the PISA School Questionnaire 2022: Assessment of the extent of the problem of verbal aggression towards school staff (left) and between pupils (right) in lower-secondary schools in Switzerland

Data: OECD (PISA); calculations: SCCRE



Reading example

6% of lower-secondary schools report that verbal aggression against teachers is a moderate problem (left). 23% of lower-secondary schools report that verbal aggression between pupils is a moderate problem (right).

36 Cantonal regulation on the deployment of persons without a teaching diploma

Status 2024

Data: EDK-IDES

Cantons	Compulsory education
AG	
AI	
AR	
BE-d	
BE-f	
BL	
BS	
FR-d	
FR-f	
GE	
GL	
GR	
JU	
LU	
NE	
NW	
OW	
SG	
SH	
SO	
SZ	
TG	
TI	
UR	
VD	
VS-d	
VS-f	
ZG	
ZH	

- Permitted with fixed-term employment and salary deduction
- Permitted with fixed-term employment
- Approved with salary deduction
- Not approved

AI: UTE students admitted on a temporary basis and with salary deduction

BE, FR-f, NW: Obligation to receive education

SO: 1st-2nd primary level with fixed-term appointment and salary deduction

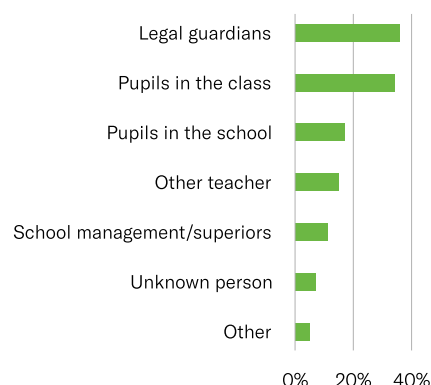
SO, TG: Approval by the office or the school supervisory authority

TI: Temporary admission to lower-secondary level due to lack of suitable applications

38 Teacher's experience of violation by perpetrator

The response rate of 16% limits the informative value of the percentages. It is possible that those affected were the ones who took part, which could lead to the values being overestimated. The sequence of the perpetrators mentioned is significant, irrespective of the exact share.

Data: Brägger (2022)



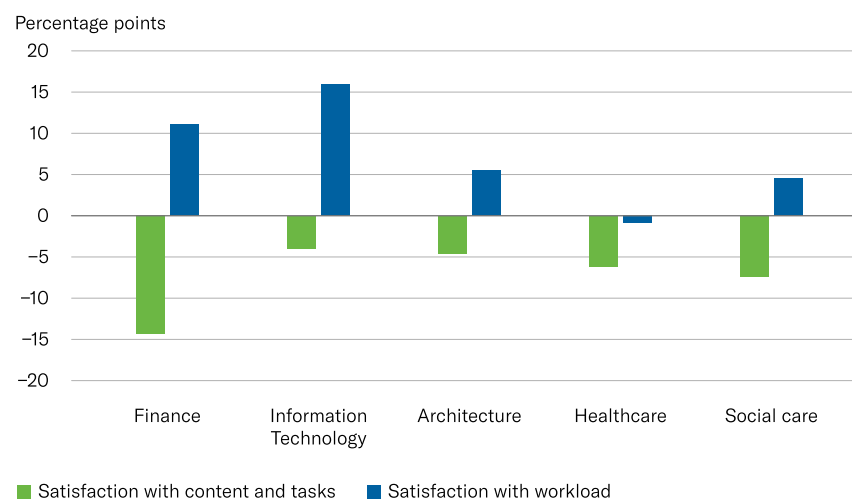
Job satisfaction of teaching staff

In view of the many challenges resulting from the organisation of compulsory education – particularly with regard to integration, collaboration with various specialists and the shortage of qualified staff – the question arises as to the job satisfaction of school staff. Representative data from the Swiss graduate survey shows that the majority of teachers are satisfied or very satisfied with the tasks of their chosen profession five years after completing their studies (80–90%). In all other occupational groups which are used here as benchmarks, the satisfaction scores in this area are lower (→ Figure 39). On the other hand, teachers are significantly less satisfied with their workload compared with other career starters (50% satisfied or very satisfied). Five years after completion, the share of teachers who are satisfied with their workload is the lowest, together with those persons working in the healthcare sector (40%). No conclusions can be drawn about the satisfaction of senior teaching staff based on this data. A regular survey in German-speaking Switzerland and now also conducted in French-speaking Switzerland gauges the job satisfaction of teachers and other school staff of the Swiss Teachers' Association. The results of the last ten years show that the job satisfaction of school staff has remained stable overall. Although the respondents stated that they were somewhat more satisfied with their salary and its development (→ *chapter Universities of teacher education, page 269*), this positive effect is neutralised by the assessment of the increased workload (*Brägger, 2024*).

39 Job satisfaction by occupational sector

Deviation from the reference category of teachers in compulsory education in terms of satisfaction with tasks and workload; basis: Share of persons who are satisfied or very satisfied with their tasks and workload; 2018 graduation cohort of university graduates in Switzerland; 5 years after completion.

Data: FSO (EHA); calculations: SCCRE



School management

In Switzerland, schools are institutionally run by school principals, who play a key role in quality assurance (EDK-IDES, 2023). The school management not only decides on staff, but is also responsible for school quality and the school climate. It thus also has a direct and indirect impact on pupils' learning success. Studies also indicate that a high fluctuation in school management can lead to higher teacher turnover and lower learning progress (Bartanen et al., 2019; Burkhauser, 2017; Kraft et al., 2016; Miller, 2013). According to the Swiss School Management Monitor 2024, the median length of stay of the surveyed school principals at their school at that time was four years (public mainstream schools). Overall, around 10% of those surveyed stated that they were actively looking for an alternative – either for their school or for their profession as a school principal (for teacher fluctuation, see *chapter Universities of teacher education*, page 269). 54% of school principals performed their role at an employment level of 80% or more. The size of the teams they manage varies widely despite similar workloads (→ Figure 40). The number of pupils at the schools run by these persons also varied accordingly, ranging from 50 to over 1,500.

Digitalisation

The educational goals in the area of digitisation include pupils learning how to use digital aids competently and teachers using suitable digital learning media (EDK, 2019b; EAER & EDK, 2023). One requirement for this is that digital aids are provided and used in schools. Although individual reports document that the equipment of schools in Switzerland has improved and the use of digital aids has increased (Educa, 2021; Suter, Maag Merki et al., 2023; Caneva, 2024; Herzing & Röhlke, 2024), until recently there was no periodic or standardised recording of the distribution and use of these aids for the whole of Switzerland and for several levels. The “Monitoring of the digitalisation of education from the perspective of pupils” launched by the federal government and the cantons in autumn 2020 provides the first representative data for the school levels of compulsory education as well as for upper-secondary education (8 to 18-year-olds).

Four surveys conducted from 2020, 2021, 2022 and 2024 are available to date (Oggenfuss & Wolter, 2024). The most significant effect associated with the COVID-19 pandemic was the private acquisition of digital devices. In 2020, a quarter of pupils in compulsory education stated that they had acquired a computer. In subsequent years, this proportion fell to 16%. It was not until 2024 that more computers were again acquired in all language regions (→ Figure 41). However, as no comparable data was collected prior to the pandemic, these developments cannot be attributed causally to the pandemic. Four surveys show that, on average every year, around 20% of families with schoolchildren in Switzerland acquire a new computer. In Ticino, this figure is significantly lower at 15%. According to four surveys, it can be seen that the slight push towards digitisation in compulsory schools has largely stabilised (→ Figure 42). Since 2022, around 90% of pupils have reported Internet access and use of computers at school.

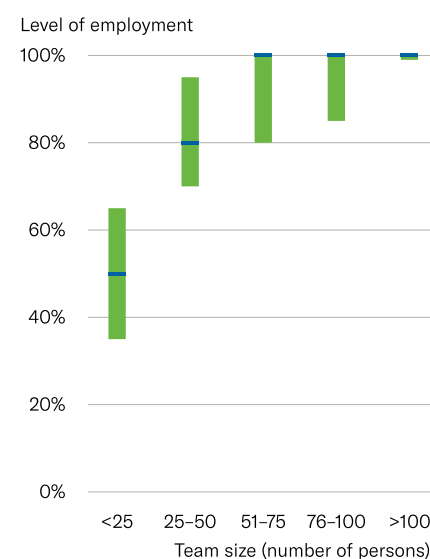
The Swiss School Management

Monitor (SLMS) is a project of the VSLCH, CLACESO and the university of teacher education FHNW (Tulowitzki et al., 2023). The SLMS is sponsored by the Mercator Switzerland Foundation and the Jacobs Foundation. Its aim is to gain insights into the work situation of school management, its professionalisation and perspectives on relevant issues (Tulowitzki et al., 2024). Around 3,000 people were surveyed in 2024 (response rate 59%).

40 Principals' level of employment and team size

Only mainstream public schools of compulsory education; blue: Median, green: medium 50%

Data: VSLCH/CLACESO/PH FHNW (SLMS); calculations: SCCRE



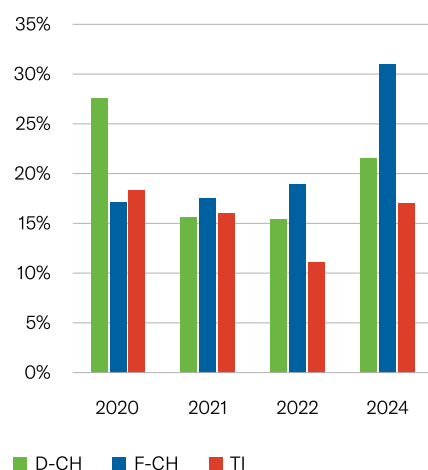
Reading example

With a team size of 76 to 100 people, school principals have a median level of employment of 100%. The level of employment of the middle 50% of this group is between 85 and 100%.

41 Private acquisition of computers

Compulsory education pupils who stated that the family had acquired a computer (desktop, laptop, tablet); controlled for individual characteristics such as gender, migration background and social origin

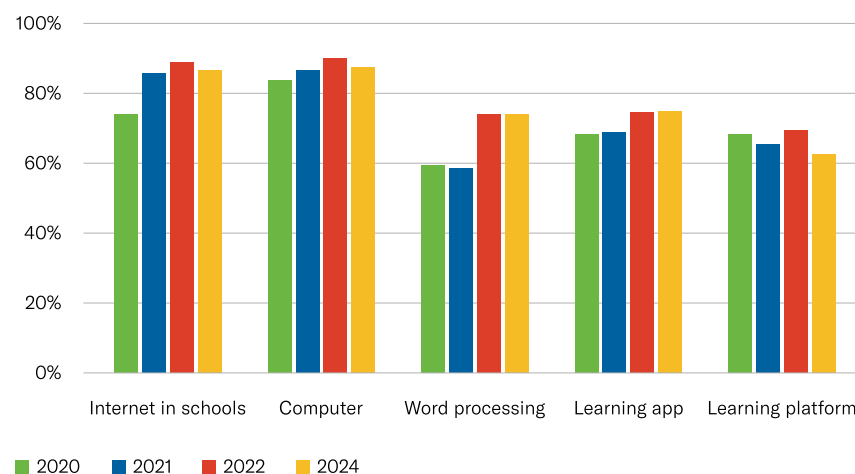
Data: SCCRE (Monitoring digitalisation)
calculations: SCCRE



42 Internet and use of digital aids at school

Share of pupils in compulsory education who reported on the availability of the Internet and the use of computers (desktop, laptop, tablet) at school and the use of digital aids at school or for school; controlled for individual characteristics such as gender, migration background and social origin

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE

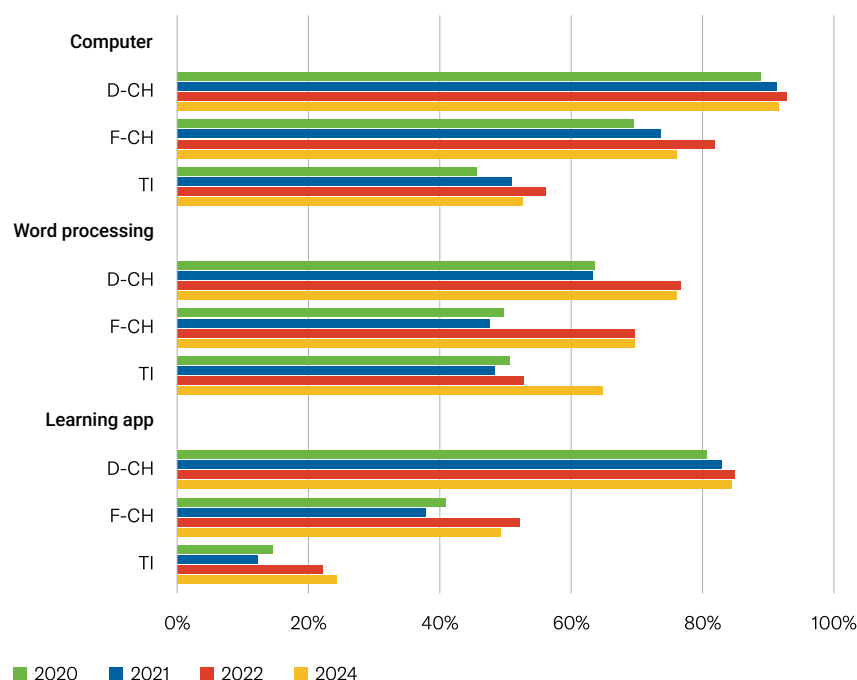


The pronounced differences between the language regions affect not only the private acquisition of digital devices, but also the technical equipment of schools and the use of digital aids in the classroom (→ Figure 43). As a result, the requirements for imparting application skills differ in the various language regions. While the availability and use of digital devices are necessary, these are not sufficient conditions for acquiring relevant skills. The educational goals in the area of digitisation also include the acquisition of skills for critical reflection and the responsible use of digital aids. With regard to a potential positive impact on the learning process, it is difficult to assess the effectiveness of the use of digital aids at school, as relevant information on the quality of use is largely lacking (*Educa*, 2021); further research would be required for this.

43 Use of digital aids by language region

Share of pupils in compulsory education who reported on the use of computers (desktop, laptop, tablet) at school and of digital aids for school; controlled for individual characteristics such as gender, migration background and social origin

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



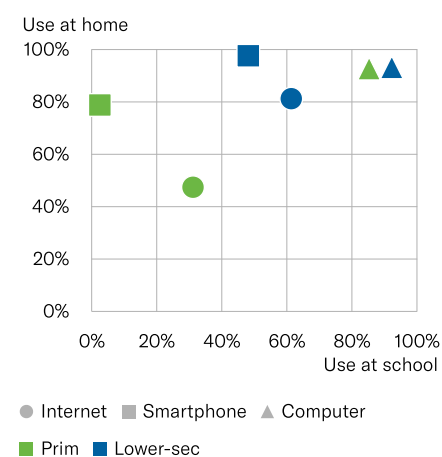
However, the use of digital aids in schools is also being critically discussed with regard to the potential negative effects of increased screen time. In various countries, efforts have therefore been made to specifically encourage the pedagogical and didactic use of digital devices in the classroom (OECD, 2023c; Skolverket, 2022) or even to reduce their use. Although there is a general trend towards more digitisation in compulsory education in Switzerland, the available data indicates that the use of digital devices is not very intensive overall and has only increased marginally over the last four years. In addition, the prevalence and intensity of use at primary school level are significantly lower than at lower-secondary level (→ *chapter Primary school level*, page 59).

A comparison of the use of digital aids at school and at home for private purposes reveals a clear pattern – significantly more pupils use them at home for private purposes than at school (→ Figure 44). When it comes to the use of smartphones, the most striking difference is apparent at primary school level. While only 3% of primary school pupils used their smartphone at school, almost 80% used it for private purposes at home. Although the use of digital devices at school increases from lower-secondary level onwards, it still lags significantly behind private use (→ *chapter Lower-secondary education*, page 85). The figures on the availability and use of media in leisure time also show just how strongly digital devices are anchored in the everyday life of children and young people outside of school. Around 43% of primary school-aged children have their own mobile phone (20% of 6- to 7-year-olds, 79% of 12- to 13-year-olds). Amongst

44 Use at home and in school

Share of pupils who reported having unlimited access to the Internet and using computers (desktop, laptop, tablet) and a smartphone in 2022 and 2024; primary level: Pupils aged 8 and over; controlled for individual characteristics such as gender, migration background and social origin

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



adolescents aged 13 and over, the share is almost 100% (Suter, Bernath et al., 2023; Külling-Knecht et al., 2024).

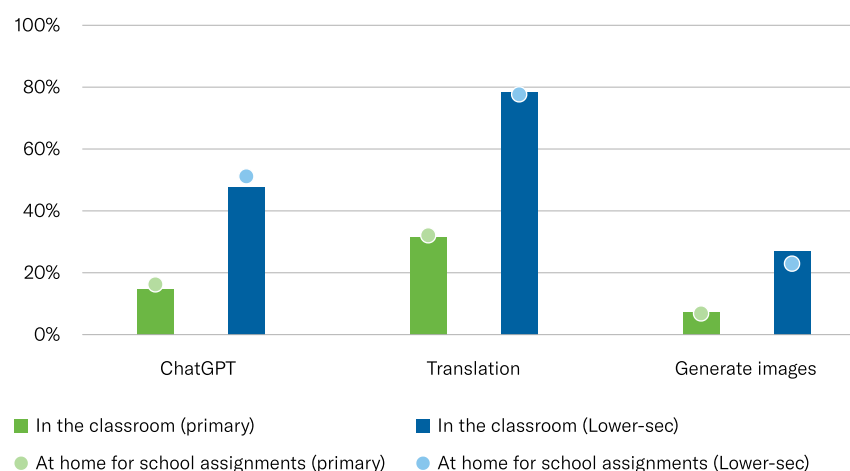
Use of artificial intelligence in everyday school life

In 2024, children and young people were surveyed for the first time representatively all over Switzerland on the use of AI-based applications such as ChatGPT and image generation programs as part of the monitoring of digitalisation – both in terms of their use in class as well as at home for school tasks. Around half of primary school pupils had already used one of the AI applications either at school or at home for school tasks, compared to 90% in lower-secondary education. If we examine usage by type of AI tool and distinguish between use at school and at home, the shares are correspondingly lower (→ Figure 45). It is striking that the frequency of use at school and at home is almost the same. However, image-generating AI tools play a relatively minor role overall, which is not surprising as these applications can only be used in a few school subjects, unlike text generation, translations or search queries.

45 Use of AI

Share of pupils in compulsory education who used AI applications in 2024; controlled for individual characteristics such as gender, migration background and social origin

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



Private school

In Switzerland, only a small proportion of pupils attend a private school during their compulsory education. The private school enrolment rate in Switzerland as a whole is 4.5% (school year 2023/24) and has fallen only marginally by 0.7% since the school year 2011/12. There is therefore no evidence of growing demand for private education at national level. The cantons have developed differently in this respect over time; cantonal differences also exist in the private schooling quota. As the longitudinal data from the FSO for the 2022/23 school year makes clear, private school quotas range from less than 1% in the cantons of Uri, Appenzell-Innerrhoden,

Grisons and Jura to 11.4% in the canton of Zug or 17.1% in the canton of Geneva.

As already shown in the 2023 Education Report, a higher share of private schools was also recorded among the group of foreign pupils in the 2022/23 school year. For these schools, at 7.4%, the quota was almost twice as high as for the share of Swiss pupils (→ Figure 46). However, this difference has remained constant over the years. Although foreign nationality pupils do not generally attend private schools more often, there is a particular tendency to do so if their parents have a high level of education (SCCRE, 2023). A parent survey (almost 7,710 persons) commissioned by the Mercator Foundation shows, amongst other things, that around 60% of the parents surveyed can imagine sending their children to a private school. For many, however, this is not possible due to the high costs. The two most important reasons why parents choose private schools or homeschooling are that these can provide better individual support or due to problems that occurred in public schools in the past (Bütikofer et al., 2023).

Homeschooling

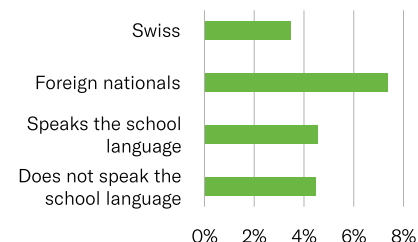
The COVID-19 pandemic led to twice as many children being taught at home in some cantons during the 2020/21 school year than in the years preceding the pandemic. With a few exceptions, an increase in homeschooling was also recorded in all cantons in subsequent years. Despite this increase, homeschooling in Switzerland will remain a marginal phenomenon in the 2023/24 school year. Only around 0.5% of the pupils in compulsory education were taught in this manner. The majority of these children and young people educated at home live in the four cantons of Bern, Vaud, Aargau and Zurich. However, even in these cantons, the share is only between 0.6 and 1% and affects a maximum of 1,300 children per canton (Bern) in absolute figures.

Homeschooling generally requires approval and is subject to state supervision (EDK-IDES, 2024b). Nevertheless, major differences exist between the cantons here as well. As a result, the requirements for homeschooling vary in terms of strictness from one canton to another, in particular with regard to the qualifications of the teacher and the supervisory measures (such as supervisory visits or increased participation in cross-school competence tests). However, the increase in applications for approval of private tuition in recent years has also led to stricter requirements for homeschooling in various cantons, for example in the canton of Bern in 2022 and in the cantons of Schaffhausen, Lucerne and Thurgau in 2023.

46 Private school enrollment rate by individual characteristics, 2022/23

Compulsory education; excluding special schools; 1st–11th school year; only unsubsidised private schools; does not speak the school language: First language does not correspond to the school language

Data: FSO (LABB); calculations: SCCRE



COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

**CONTINUING EDUCATION
AND TRAINING**

PRIMARY SCHOOL LEVEL

Context

Early childhood education and care

Early nurturing involves supporting children during their learning process from birth to starting the primary level at the age of four. It is the cantons which are primarily responsible for childcare outside the family and school. The federal government only intervenes on a subsidiary basis and regulates the most important framework conditions in the Ordinance on the Placement of Children in Foster Care (PAVO¹) (SODK & EDK, 2022). Besides general offers for the early nurturing of children and their families (e.g. in play groups, daycare centres or with childminders) there is also therapeutic early education.² This is aimed at families with children who need special support to strengthen their resources. The 2018 and 2023 Education Reports already showed that the provision of childcare outside the family in Switzerland is recorded on a largely non-systematic and irregular basis. A recent report commissioned by the Conference of Cantonal Directors of Social Services (SODK) shows that surveys on childcare services outside the family for pre-school children are carried out at varying intervals in eighteen cantons. Comparing the data is made difficult not only due to the different survey dates, but in particular by a lack of uniformity and coherence (Ecoplan, 2020; Lüssi, 2024; Stern et al., 2012). While some cantons have published reports and surveys on the situation and financing of childcare outside the family (Kanton Zürich, 2024), it is not possible to make statements on the provision of early childhood education and care (ECEC) for Switzerland as a whole even years later based on national statistics.

Data from the sample survey on Families and Generations (EFG) conducted every five years by the Federal Statistical Office (FSO) shows that almost two-thirds of households with children under the age of four in Switzerland used childcare outside the family in 2022. Taking all children under the age of thirteen into account, this figure was as high as 74% (FSO, 2024l). For children under the age of four, nurseries (37%) and grandparents (35%) are the most important forms of care (FSO, 2022a). This is also reflected in an international comparison. Children in Switzerland are much more likely to be cared for by grandparents or relatives than in the neighbouring European countries (→ Figure 47). In comparison, Switzerland is 32% below the EU average (FSO, 2025c) in terms of formal childcare – in a nursery or a day-care family affiliated with a day-care organisation. This is probably due, among other things, to the heterogeneity of the offerings, but also to the high costs of care (Gromada & Richardson, 2021; Gachet & Zumbühl, 2021; Neumann et al., 2015).

A new report by the Swiss Academy of Humanities and Social Sciences (SAHS) investigated the attitudes of 2,161 parents in Switzerland towards full-day childcare using an online panel. The results show that many parents welcome day schools and day-care facilities, especially in urban areas. Parents in German-speaking Switzerland are generally less interested in **full-day childcare** than in French-speaking Switzerland. Regardless of the language region, a better work-life balance is important to the parents. Interest in all-day schools increases with rising income and education levels, and is particularly pronounced among foreign parents (Duchêne et al., 2025).

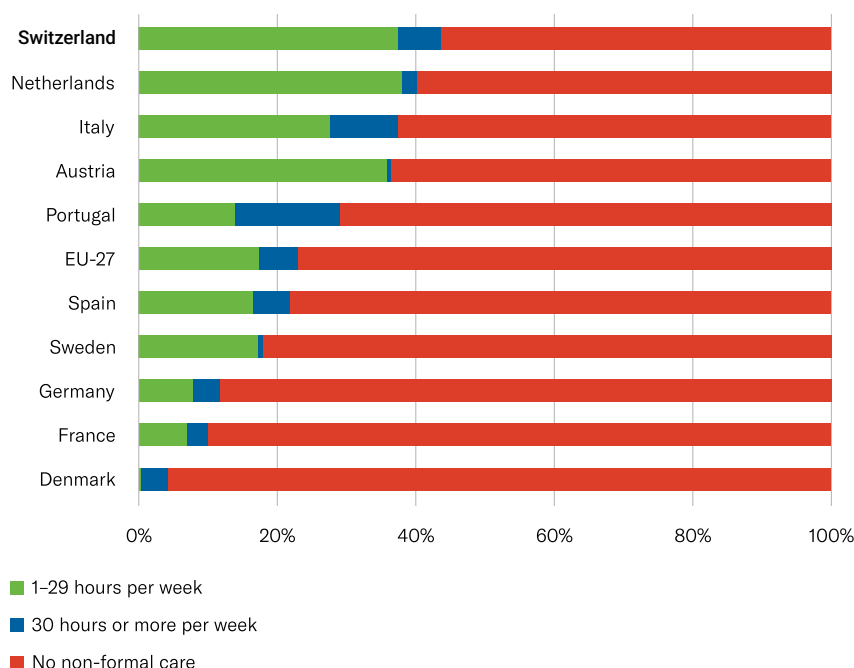
1 The Ordinance on the Placement of Children in Foster Care of 19 October 1977 (PAVO, SR 211.222.338), also known as the Foster Care Ordinance, governs the licensing and supervision of childcare facilities at the federal level (SODK & EDK, 2022).

2 Federal Constitution, Art. 62 para. 3.

47 Non-formal care of children under 3 years of age, 2022

Non-formal care corresponds to non-institutional care; includes grandparents, other private individuals, independent childminders or an au pair

Data: Eurostat (SILC)



The financial burden on families in Switzerland also varies greatly depending on the canton and municipality, particularly with regard to the costs of institutional childcare (*Stern et al., 2015; Stern et al., 2021*). The Federal Act on Financial Aid for Child-Care Outside the Family³ has been promoting the reconciliation of family and employment or education since 2003. Three types of financial assistance are envisaged as part of the impulse programme for the promotion of childcare outside the family⁴: Financial aid for the creation of childcare places (since 2003), financial aid for cantons and municipalities that increase their subsidies for childcare outside the family in order to reduce parents' childcare costs (since 2018), and financial aid for projects to optimise the provision of childcare for working parents (also since 2018). The evaluation of the latest financial aid for subsidy increases from cantons and municipalities shows that the annual expenditure on childcare outside the family varies greatly between the cantons and that these differences remain large even after the subsidy increases have been implemented (*Stern et al., 2022*). As an analysis in the canton of Geneva shows, there are major differences in the prioritisation of access criteria within the canton. The two most important prioritisation criteria for a nursery place are the parents' place of residence and professional situation (*Brüderlin & Jaunin, 2023*).

³ Federal Act on Financial Aid for Child-Care outside the Family, SR 861.

⁴ The impulse programme has been extended until the end of 2026 and is to be replaced by a new law (parliamentary initiative 23.478).

Use and effect of pre-school-age care

Various studies show that a high structural and process quality of child-care services in particular has a positive effect on children's linguistic, socio-emotional and cognitive development (Cecchini *et al.*, 2023; Grob *et al.*, 2019). However, other studies point to negative consequences of attending nurseries, such as more frequent socially problematic behaviour (e.g. aggression, ADHD) (Averdijk *et al.*, 2022). The research literature does not dispute the observation that children from educationally disadvantaged parents benefit more from the use of external care. High-quality daycare facilities can therefore make an important contribution to achieving educational equity (Baulos *et al.*, 2024; Camehl & Peter, 2017; Eurydice, 2025; Melhuish *et al.*, 2015). However, the problem is that children who would potentially benefit most from attending a daycare centre often use it the least, due to a lack of information, structural access conditions or high costs, for example (Cornelissen *et al.*, 2018; Hermes *et al.*, 2023; Hermes *et al.* 2024; Jessen *et al.*, 2020). Many studies and projects therefore also aim to strengthen parental skills or collaboration between parents and the nursery (Dadisman *et al.*, 2024; Lanfranchi, 2002; Lanfranchi *et al.*, 2007; Maleq, 2023; Vogt *et al.*, 2022). A high pedagogical quality of early childhood education is also crucial for early language development. However, there are currently no uniform quality standards in Switzerland. The first cornerstones of quality have been defined at federal level. However, the cantons are responsible for regulating childcare services (Ecoplan, 2023; SODK & EDK, 2022). International studies show that attending an early childhood service such as a nursery or play group has a positive effect on school language skills. This requires that the quality and quantity of the linguistic input is high (Albers *et al.*, 2009). A positive impact is particularly evident in the case of multilingual children (Grob *et al.*, 2014; Grob *et al.* 2019; Weinert & Ebert, 2013).

As a recent study commissioned by the State Secretariat for Education, Research and Innovation (SERI) shows, implementation of early language support in Switzerland is very heterogeneous in the different language regions. The cantons of Western Switzerland focus on the accessibility and quality of early childhood development services in general (universal). In German-speaking Switzerland, selective approaches are predominant, with language support clearly geared towards children with other first languages. In Ticino, on the other hand, the majority of children from the age of three attend the Scuola dell'infanzia (pre-school) and are supported by language support teachers if necessary (Vogt *et al.*, 2022; Federal Council, 2022b).

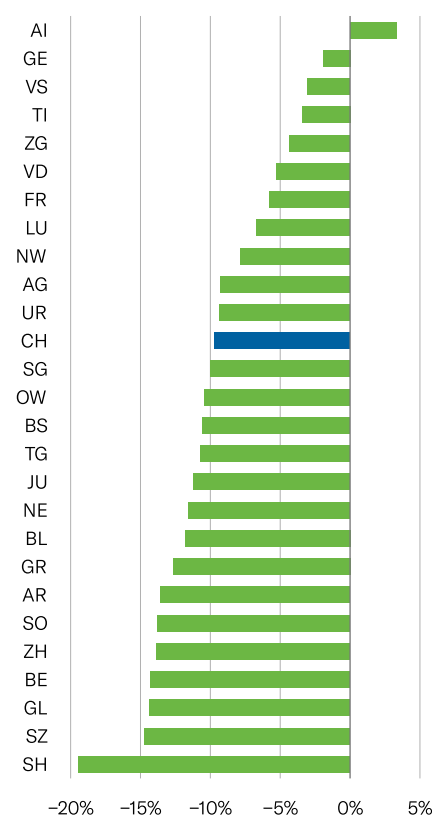
Development of pupil numbers and scenarios

Following a decline in previous years, there was an increase in the number of pupils in the 1st and 2nd school year between 2011/12 and 2023/24 by 22.7%, in the 3rd–8th school year by 27.2% (FSO, 2025d). Due to the decline in birth rates between 2021 and 2024 (–12.7%) (FSO, 2025b), the education scenarios of the Federal Statistical Office (FSO) from 2025/26 to 2034/35, primarily for the 1st and 2nd school year at primary level (→ Figure 48) expect a sharp decline in pupil numbers (–9.7%). This is due to the fact that the decline in the birth rate will make itself felt from 2026 onwards (→ chapter Compulsory

48 Pupil scenarios for primary level 1–2, 2025–2034

Reference scenario; including private schools, special needs schools and special needs classes

Data: FSO; calculations: SCCRE



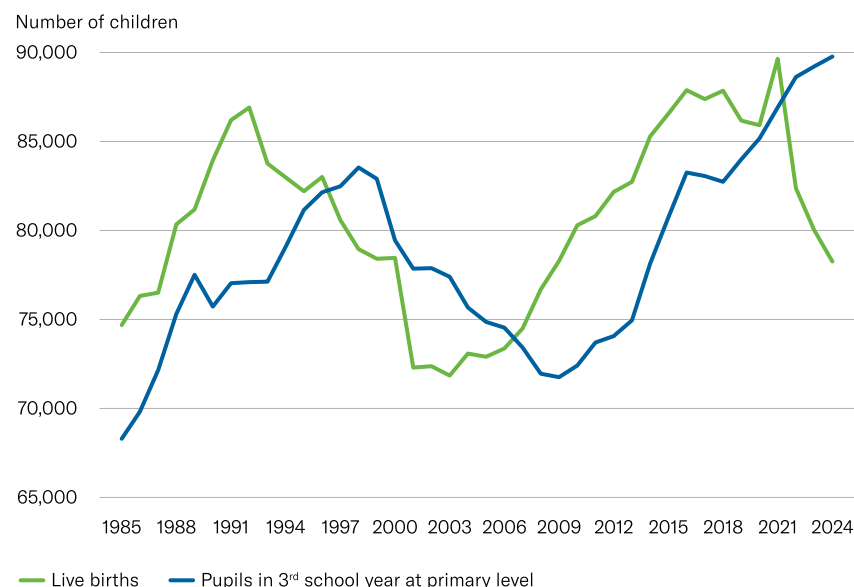
education, page 33). Between 2026 and 2028, there will be around 3,960 fewer pupils entering the primary level every year. This will have a specific impact on the schooling situation. For at least three years, an average of 212 classes (average class size 18.7) less will be needed in the 1st and 2nd years of the primary level. The cantonal differences are considerable. In the reference scenario, the forecasted developments range from an increase of +3.3% (Appenzell Innerrhoden) to a decrease of -19.5% (Schaffhausen). From 2028 at the latest, the decline in birth rates will also have an impact on pupil numbers in the 3rd–8th school year at primary level. For the period 2024 to 2034, the Federal Statistical Office predicts a decline of 5.7% to 530,087 pupils in 2034. Here too, there are significant cantonal differences (→ Figure 49).

In addition to the declining birth rates since 2021, the demographic characteristics of the potential parent generation also point to a continuation of this downward trend. A look at the development of births over the last forty years reveals a wave-like pattern. The birth rate follows the development of the parent generation with a delay of around 25 to 30 years. The number of children entering primary school again reflects this development with an additional delay of six years (age of entry in primary school) (→ Figure 50). With an average age of 31.3 years of mothers at the birth of their first child (in 2023), years with low birth rates will become parents in subsequent years. This would mean that the decline in birth rates would continue until at least 2030—not taking into account immigration and emigration. This would also have an impact on the future demand for teachers (→ chapter Universities of teacher education, page 269).

50 Comparison of the development of birth and pupil numbers

Only mainstream classes; primary level 1st–8th school year

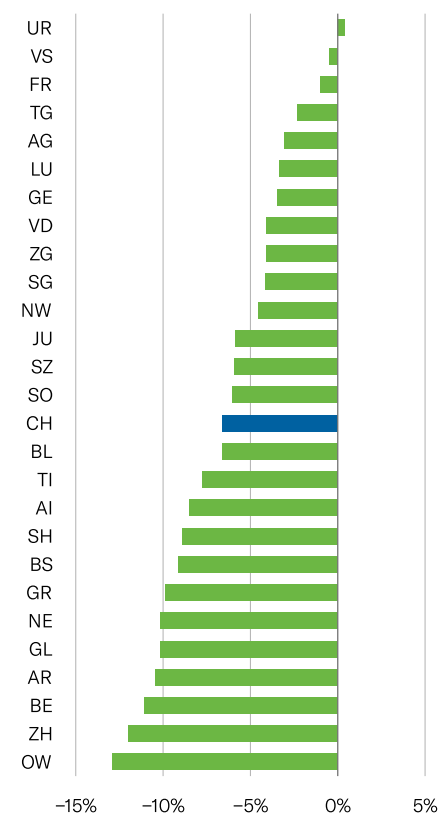
Data: FSO



49 Pupil scenarios for primary level 3–8, 2025–2034

Reference scenario; including private schools, special needs schools and special needs classes

Data: FSO; calculations: SCCRE



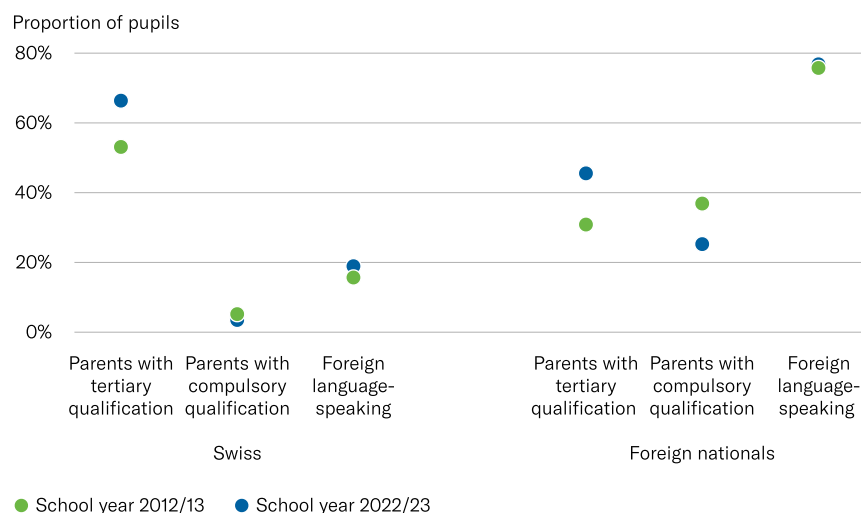
Composition of pupil population

Sociodemographic pupil characteristics, such as nationality and first language, are important framework conditions for school and tuition. In the 2023/24 school year, around 71% of pupils at primary level (1st–8th school year) had Swiss citizenship. This share has fallen by around three percentage points over the past decade (2013/14: 74%). Overall, background factors such as the country of birth or first language among primary pupils with Swiss nationality have hardly changed over the past ten years – in contrast to the pupil population at lower-secondary level (→ *chapter Lower-secondary education, page 85*). The same applies to foreign primary school pupils. Only at the highest parent education is there a sharp increase in the proportion of parents with a tertiary qualification in both groups. In the 2022/23 school year, around two-thirds of Swiss pupils had at least one parent with a tertiary qualification (→ Figure 51). These parents thus had a similar level of education to their children's teachers. This was the case for around 45% of children with foreign nationality. This increase is accompanied by a decline in the proportion of children whose parents do not have a post-compulsory education qualification for both Swiss and foreign pupils.

51 Pupils at primary level (1st–8th school year), comparison 2012/13 and 2022/23

Public schools including special needs schools and special needs classes; parental education: highest level of education attained by parents (based on a sample); foreign language-speaking: First language does not correspond to the school language

Data: FSO (LABB); calculations: SCCRE



The reported values may be biased for two reasons: Firstly, naturalised foreign nationals are regarded as Swiss nationals in statistics. Secondly, due to the new Federal Act on Swiss Citizenship (2018) with more restrictive requirements, more people with a university degree are naturalised. This means that the change for pupils with a Swiss passport and parents with tertiary education tends to be overestimated, while the change for foreign nationals tends to be underestimated. However, as the 2023 Education Report showed that most children only become naturalised at lower-secondary level, the bias is likely to be small (SCCRE, 2023).

Reading example

In the 2012/13 school year, around 31% of the parents of schoolchildren of foreign nationality had a tertiary qualification. In the 2022/23 school year, this share was already 45.5%, which corresponds to an increase of around 47%. Among Swiss nationals, the proportion of parents with a tertiary qualification increased by 25% over the same period.

Institution

In Switzerland, the primary level lasts eight years and covers the 1st to 8th school year. The first two school years correspond to pre-school or the first two years of a first learning cycle. The structural harmonisation has led to changes in the duration and structure of the primary level. Nevertheless, there are still differences in the structure of the first cycle (1st–4th school year) or when transferring from the second cycle (5th–8th school year) to lower-secondary level. In the canton of Ticino, the lower-secondary level continues to last four years. The transfer takes place in the 7th school year at primary level.

Organisation of the first cycle

The first two years of compulsory education were also structured differently in the cantons in the 2023/24 school year. Eighteen cantons have integrated two years of pre-school or the first two years of the first learning cycle into compulsory education. The primary level is accordingly eight years in these cantons. These are the fifteen HarmoS accession cantons as well as the cantons of Aargau, Appenzell Ausserrhoden and Thurgau. In eight other cantons, the primary level also lasts eight years, although only seven years (Appenzell Innerrhoden, Lucerne, Nidwalden, Obwalden, Schwyz, Uri and Zug) or six years (Grisons) are compulsory (EDK-IDES, 2024c). Another possibility of adding flexibility to the initial school years is the first learning cycle being offered either as an *Grundstufe* (two years of pre-school and the first primary class) or as a *Basisstufe* (two years of pre-school and the first two primary classes). Both forms also allow for mixed-age learning (→ *Mixed-age learning*, page 69). One advantage of this flexibility is the cessation of the selective threshold at the transition from pre-school to primary school (EDK, 2014a; Lanfranchi, 2002; Lanfranchi et al. 2007). Various cantonal studies look at the changed situation in pre-school (or the first years of a first learning cycle) as a result of structural harmonisation and evaluate the current situation; in the case of the canton of Geneva, the introduction of the educational innovation project EP21 is being examined with regard to the speed of implementation – differentiated according to actors and schools – and approval of the content (Kanton Luzern, 2021; Dutrévis et al., 2022; Dutrévis et al. 2024; Edelmann et al., 2018; Fasseing Heim et al., 2018; Imlig et al., 2019).

School entry age, cut-off date and delayed start to schooling

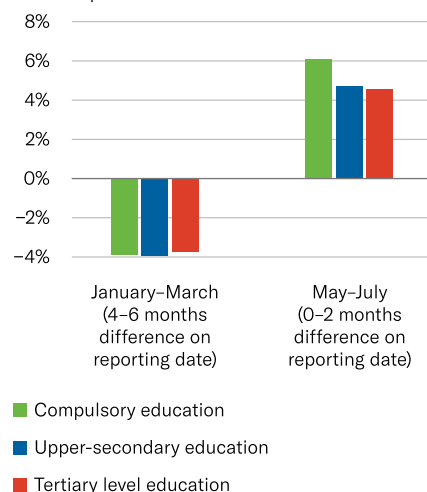
In the 2023/24 school year, 31 July was the cut-off date in a total of 20 cantons. In six cantons, the cut-off date is scheduled earlier. The earlier the cut-off date in the calendar year, the older the pupils are when they start school. Different cut-off dates also mean that children of the same biological age can normally start school one year earlier or later depending on the canton. As a consequence, these pupils will enter further education courses and ultimately the world of work one year earlier or later (SCCRE, 2023).

52 Distribution of births in compulsory education

Including private and special needs schools; 2011–2022; parent education based on samples

Data: FSO (LABB); calculations: SCCRE

Deviation from the statistical normal distribution of births per month



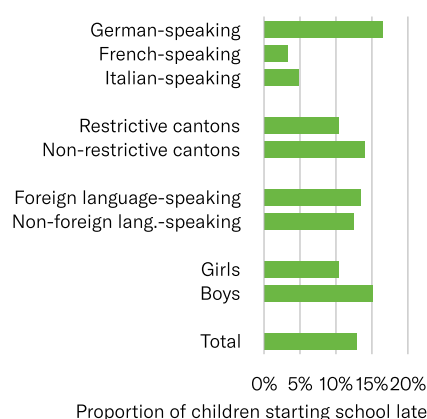
Reading example

With an even distribution, 24.99% (three times 8.33%) of births would be expected between May and the end of July. In fact, it is 26.51% for parents without post-compulsory education – around 6% more.

53 Delayed start to schooling, 2022

Only mainstream classes in public schools; delayed start to schooling in 3rd primary level year; foreign language-speaking: First language does not correspond to the school language

Data: FSO (LABB); calculations: SCCRE



Reading example

In restrictive cantons, the proportion of children with delayed start to schooling is 35% lower than in non-restrictive cantons – 10 of 100 children are affected instead of 14.

The probability of starting school at the normal age also depends on the month in which a child was born and the number of days between his or her date of birth and the cut-off date. Both factors influence how a child is positioned relative to his or her classmates in the age distribution of the class. The younger a child is, the more likely it is to perform worse than its older classmates in performance tests due to the biological age difference (Aune *et al.*, 2018; Balestra *et al.*, 2020; Beatton *et al.*, 2021; Fummarco *et al.*, 2022; Givord, 2020; Sontheim, 2025). The relative age effect (in a class comparison) and the correlation with the probability of delayed school enrolment have also been demonstrated for Swiss primary schools (SCCRE, 2023).

Various international studies also show that births vary seasonally according to parents' educational level (seasonality of births) (Clarke *et al.*, 2019; Grootendorst *et al.*, 2025). In Switzerland, births are seasonal. There were more births in the months before the cut-off date. In particular, children born to parents without a post-compulsory qualification are disproportionately frequent in the months of May to July (→ Figure 52). As the probability of a delayed school enrolment depends on the time between the month of birth and the cut-off date, children in this group are more likely to have a delayed start to schooling than children of parents with tertiary education for demographic reasons. Children of parents with an upper-secondary level qualification have a delayed start to schooling just as often as children of parents without a post-compulsory qualification.

Even more than demographic reasons and cut-off dates, the number of late school enrolments in Switzerland depends on cantonal particularities (SCCRE, 2023). Specifically, it is the structural requirements regarding the number of compulsory pre-school years, access to the HarmoS Agreement and implementation of the key principles contained therein that decide the deferral rate. If, for example, only one year of compulsory pre-school is taken into account in cantons without two years of compulsory pre-school, the cantonal rate of delayed schooling falls sharply in these cantons. However, as many children in these cantons still attend pre-school for two years, this leads to a greater number of children entering late in the 3rd school year (SCCRE, 2023).

Furthermore, the strictness of the application of the school enrolment rules⁵ influences the proportion of children with delayed start to schooling (→ Figure 53). In practically all cantons, the parents may request early or deferred entry if they have justification for doing so. There are, however, marked inter-cantonal differences in some instances as regards the parents' right to have their say in the final decision. In restrictive cantons where parents' right to choose is more severely restricted, the proportion of delayed (and in some cases also premature) school enrolment is lower, leading to a higher proportion of children enrolled in school on time.

If we look not only at the delayed start to schooling in a school year, but also at the development over the last ten years, it becomes apparent that the proportions of children with a delayed start to schooling vary greatly from canton to canton. This applies both over time as well as for comparisons at a specific point in time. Cantons such as Jura, Lucerne and Valais have seen a sharp decline in the proportion of children with a delayed start to schooling over the past ten years (below the diagonal proportional line

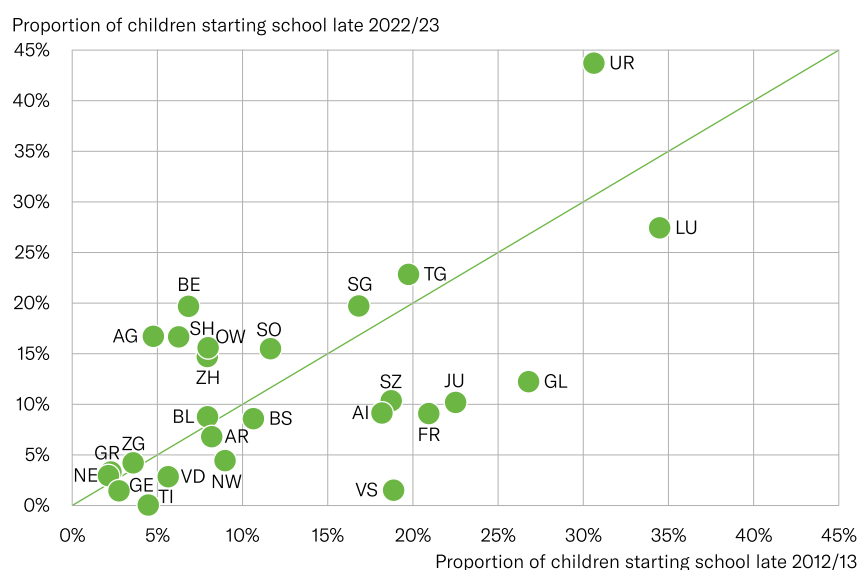
⁵ Restrictive cantons: Appenzell Innerrhoden, Basel Stadt, Grisons, Jura, Neuchâtel, Nidwalden, Valais (French-speaking part), Ticino and Zurich.

→ Figure 54). The cantons above the proportional line, on the other hand, recorded an increase in delayed start-ups over time (e.g. Aargau, Bern, Schaffhausen or Uri). More than half of the cantons that postponed the cut-off date to 31 July for the 2012/13 school year to 2022/23 recorded higher rates of children with a delayed start to schooling during the period under review. The importance of cantonal particularities is also reflected in the fact that the differences between cantons with the same cut-off date remain large.

54 Delayed start to schooling over time, 2012/13 and 2022/23

Only public schools, only mainstream classes; delayed start of schooling to 3rd school year at primary level; 12 cantons have adjusted the cut-off date of the 2012/13 school year to 2022/23: Aargau, Basel Landschaft, Basel Stadt, Bern, Lucerne, Obwalden, Schaffhausen, Schwyz, Solothurn, Valais, Vaud and Zurich

Data: FSO (LABB); calculations: SCCRE



Pupils with individual educational needs

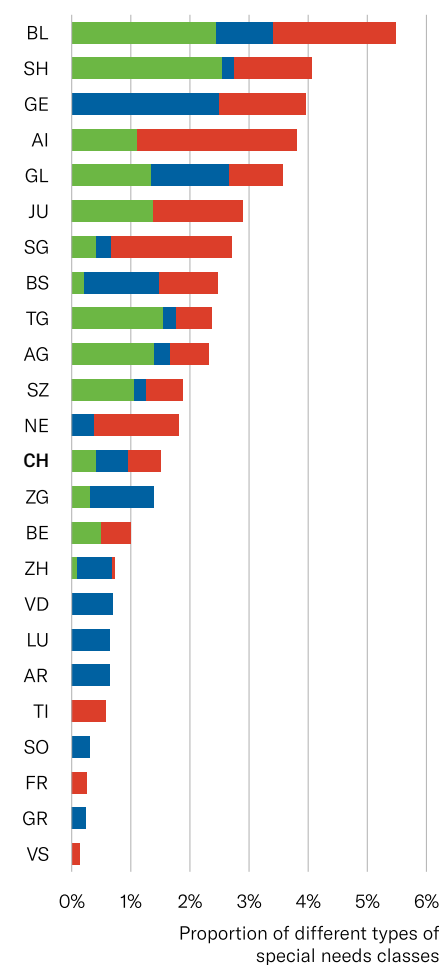
Analysis of the data from the modernised statistics on special needs education shows that the proportions of children in special needs schools have been relatively stable since 2017, while the proportion of children in special needs classes has fallen slightly over this period⁶ (*Lanners, 2024*). The cantonal proportions of children attending special needs schools or special needs classes still vary greatly between the cantons. With the new data from the statistics of special needs education, the category of special needs classes can be viewed in more differentiated terms (*FSO, 2019, 2020a*) (→ Figure 55). It is now possible to differentiate between time-limited forms of schooling – such as classes for foreign-language speakers and preparatory classes – and the other special needs classes (such as special needs classes or small classes). The proportions of the different types of special needs classes vary from canton to canton.

⁶ The number of special needs classes is on the decline, but it is developing dynamically – due for example to migration or political developments. For example, the increase in foreign language-speaking pupils can be explained by Russia's war against Ukraine (*Lanners, 2024*).

55 Special needs class quotas, 2022/23

3rd–8th school year at primary level; Nidwalden, Obwalden and Uri do not provide details of special needs classes

Data: FSO (LABB); calculations: SCCRE



■ Proportion of introductory classes
 ■ Prop. of classes for foreign-language speakers
 ■ Proportion of other special needs classes

Other special needs classes: The other special needs classes are aimed at pupils with special needs, usually due to slight learning or behavioural difficulties. The cantons use various terms for this, including the term “small class” (FSO, 2025e).

Introductory classes: Mainstream school classes which serve to school children with insufficient requirements for mainstream school; in the introductory class, the subject matter of the 3rd primary school class is taught in two years. The preparatory year also belongs in this category (FSO, 2025e).

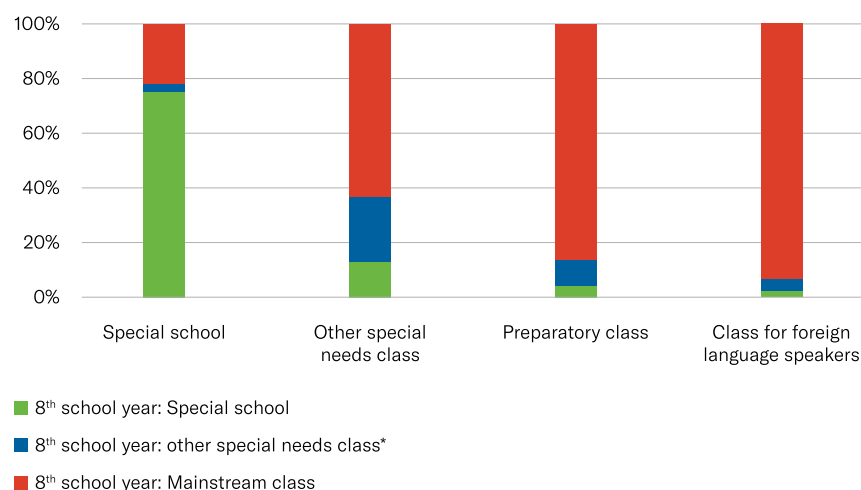
Classes for foreign language speakers: Mainstream school classes whose primary purpose is to teach children sufficient language skills so that they can follow lessons in a mainstream class (FSO, 2025e).

Major differences can be seen in the structuring of the integrative and separate school measures (Sahli Lozano et al., 2021; Sahli Lozano et al., 2022; Repubblica e Cantone Ticino, 2024) as well as in the allocation of children to the various measures. New studies from Switzerland show that access arrangements are more often granted to children with a higher socioeconomic background, while the lowering of learning goals tends to affect children with a lower socioeconomic background (Guilley et al., 2023; Sahli Lozano et al., 2022; Sahli Lozano, Setz et al., 2023). It remains unclear how these specific integrative support measures are connected with school performance and the individual’s perceived integration. According to studies on primary and lower-secondary levels, however, reduced learning goals are associated with poorer performance at school, while access arrangements correlate positively with academic performance (Sahli Lozano et al., 2022; Sahli Lozano et al., 2024). The cantonal differences in the proportions of separately educated children and young people in special needs classes or special needs schools as well as the different allocation to the various measures are also significant in view of the fact that, depending on the form of schooling, returning to a mainstream class is not equally probable (Snozzi et al., 2025). Of the children who at the start of their school career (3rd school year of primary level) attend another special needs class, only just under 63% return to the mainstream class by the end of primary school level (→ Figure 56).

56 Return to mainstream classes and continuing in special settings

Distribution of pupils, who attended a special school or a special needs class in the 3rd school year of primary school level, by type of schooling in the 8th school year (mainstream class, special needs class or special school); 3rd–8th school year at primary level; cohorts 2017–2022

Data: FSO (LABB); calculations: SCCRE



* The category “Other special needs class” in the 8th school year includes tuition in supportive or small classes.

This is even clearer in the case of special needs schools: 75% of these pupils remain in this form of school until the end of primary level, while only 22% switch to a mainstream class. Children from classes for foreign language speakers and from introductory classes most often return to mainstream classes. The low back-school rate of children who return to mainstream class in separative settings after enrolment increases with the transition from primary to lower-secondary education (→ *chapter Lower-secondary education*, page 85).

Around 43% of children with enhanced measures (3.9% in the 2023/24 school year) were taught in mainstream classes throughout Switzerland (integration rate). Here too, there were major cantonal differences (→ Figure 57). In the majority of cantons, the proportion of pupils with enhanced measures in mainstream classes has, however, increased over the past five years. This is important insofar as the benefits of integrative support (stronger peer relationship, higher level of well-being, better school performance, etc.) for the supported children have been confirmed in various studies. This applies to children with development needs as well as to the particularly gifted (*Balestra et al., 2020; Bless, 2018; Sallin, 2022; Sermier Dessemond et al., 2011*). However, the distribution of children to be schooled in an inclusive manner play a key role for the impact both on the integrated children and on their fellow pupils in the mainstream classes. A distribution of these children as evenly as possible would both reduce the potentially negative impact on fellow pupils while having a positive impact on the children's school career with special measures (*Balestra et al., 2020; Dlabac et al., 2022; Sallin, 2022*).

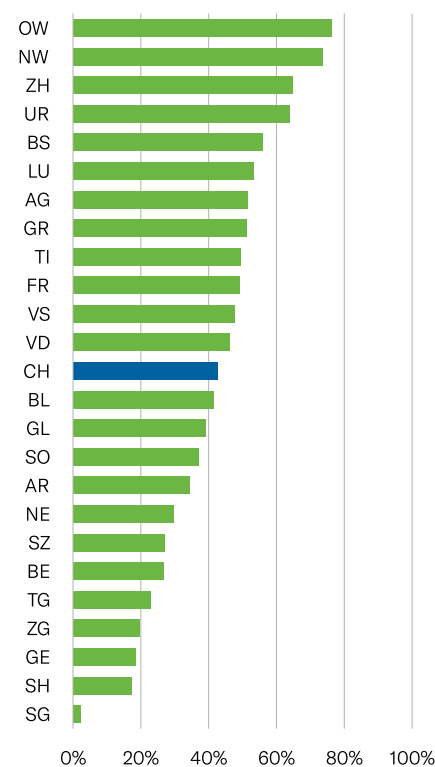
Mixed-age learning

Mixed-age classes are common at primary school level. They exist for demographic reasons and in particular in schools with initial or basic levels, in which they exist by definition (→ *chapter Compulsory education*, page 33). Of particular interest now is the question of whether mixed-age classes will continue to exist not only at the beginning of the primary level but also in the last two school years. In this phase, schools once again have the opportunity to select the appropriate teaching model. Data from the Federal Statistical Office (FSO) shows that schools with mixed-age classes in the first years tend to maintain this. Overall, the proportion of pupils in mixed-age classes for the entire primary level in the 2022/23 school year was 23.7%. At the beginning of the primary level it was 27.1%, while in the last two school years (in other words, in school years 7 or 8) it was 20.8%. The probability of being taught in a mixed-age class in the 7th or 8th school year differs greatly between the language regions (→ Figure 58). It is 14 percentage points higher in German-speaking Switzerland than in French-speaking Switzerland, which indicates different philosophies in the language regions. The degree of urbanity also has an impact on the spread of mixed-age classes in the last two years at primary level. In the 2022/23 school year, this accounted for 48% in rural areas, 27% in agglomerations and just 12% in urban regions. These differences can be explained by factors such as structural conditions and school's organisational requirements.

57 Integration in mainstream classes, 2023/24

Information by school canton; 1st–11th school year; proportion of all pupils with enhanced measures attending a mainstream class; unknown type of measures in the cantons of Jura and Appenzell-Ander Rhoden

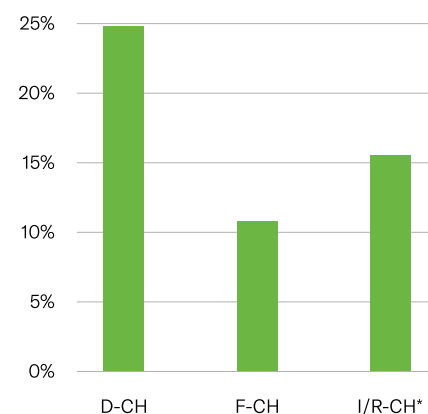
Data: FSO; calculations: SCCRE



58 Mixed-age classes by language region

Controlled by urbanity; only public institutions

Data: FSO (LABB); calculations: SCCRE



* I/R-CH: Italian- and Romansh-speaking regions

Effectiveness

In order to assess the effectiveness of the primary level, it is necessary to examine the extent to which the learning objectives set at the end of the first eight years of compulsory education have been achieved. In 2011, the Swiss Conference of Cantonal Ministers of Education (EDK) formulated national education goals for the fields of study of school language, foreign languages, mathematics and natural sciences, the achievement of which was reviewed for the second time as part of the review of the national education objectives (ÜGK) at primary level. However, since the latest data from the 2023/24 school year on basic competencies in the school language and mathematics in the 4th school year at primary level is not yet available, cantonal performance tests must be used for performance data. In addition to teaching traditional school skills, the mission of the compulsory school also includes teaching cross-curricular skills. Apart from civic education (→ *chapter Lower-secondary education, page 85*), this also includes, for example, education for sustainable development (→ *chapter Compulsory education, page 33*) and targets in the area of digital skills.

Effect of culturally influenced time preferences

LTO

The terms *patience* (Falk et al., 2018) and *long-term orientation* (LTO) (Hofstede et al., 2010) designate the individual or cultural tendency to favour short-term over long-term rewards or vice versa. Cultures with a long-term orientation are willing to postpone short-term needs in order to achieve long-term goals (high LTO). Individuals with a low LTO value are dominated by the need for immediate reward and the preservation of traditional values. The LTO value can lie between 0 and 100 points. China, for example, has a high LTO value of 87, while Mexico has a low one at 24 (Hofstede, 2001; Minkov & Hofstede, 2012).

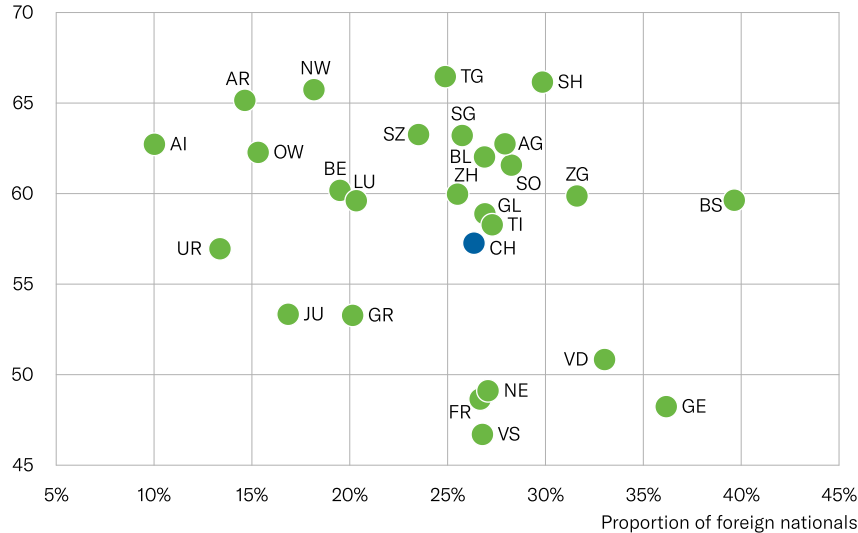
In the 2023/24 school year, around 29.5% of pupils at primary level (1st–8th school year) had foreign nationality, and just under 36% did not speak the school language at home. Children with foreign nationality come from a variety of countries of origin. International studies now show that the culturally influenced time preferences of the respective countries of origin play a decisive role in explaining educational choices and outcomes. For example, young people with a high LTO are more likely to start tertiary education (De Paola & Gioia, 2017; Figlio et al., 2019; Golsteyn et al., 2014; Sutter et al., 2019). However, different time preferences explain not only differences between individuals, but also between countries and cultural groups (Hanushek et al., 2023). In Switzerland, the average long-term orientation of the countries of origin of foreign pupils by canton is considered for the current Education Report (→ Figure 59). There are significant differences between the canton with the highest average LTO value (Thurgau) and the canton with the lowest LTO value (Valais). This reflects the different origin structures of foreign pupils in the various cantons. At the same time, the cantonal average value for long-term preference is not connected with the proportion of foreign children in primary school (3rd–8th school year).

59 Long-term orientation of foreign primary school pupils by canton, 2022/23 school year

Mainstream schools only; 3rd–8th school year

Data: FSO (LABB), WVSA; calculations: SCCRE

LTO points of foreign nationals



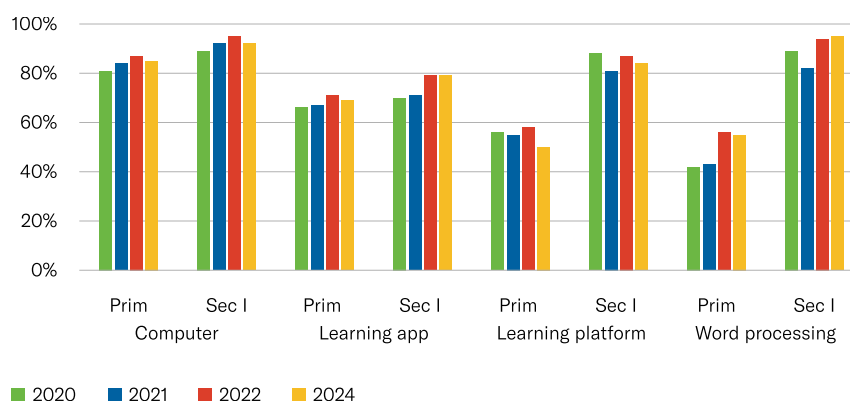
Frequency of use of digital technologies at school

The digitalisation strategy of the Swiss Conference of Cantonal Ministers of Education (EDK) calls for teachers to make targeted use of digital learning media and for pupils to learn how to use digital technologies competently (EDK, 2019b). Since 2020, the availability and use of digital aids at schools in Switzerland have been recorded across all levels as part of the monitoring of the digitalisation of education (Oggenfuss & Wolter, 2021a, 2021b, 2023). The fourth and most recent wave of surveys showed that the moderate surge in digitalisation observed between 2020 and 2022 had largely stabilised at the 2022 level in 2024 (Oggenfuss & Wolter, 2024). Major differences still existed between the educational levels when it came to the use of digital aids. For example, digital devices and tools such as computers, learning platforms and word processing programs were used much more frequently at lower-secondary level than at primary level (→ Figure 60).

60 Use of digital devices at or for school, by level

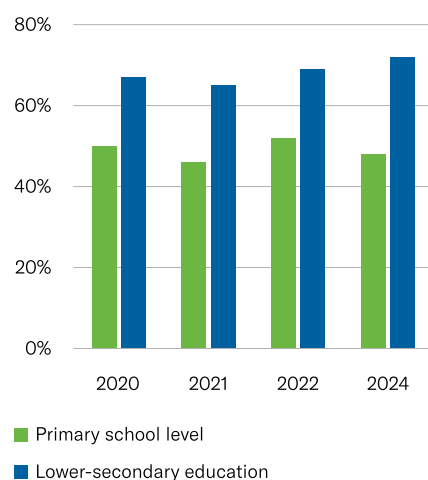
Primary level: Children aged 8 and over taken into account; computers include desktop computers, laptops and tablets; controlled for individual characteristics.

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE

**61 Daily use of computers at school, by level**

Checked for individual characteristics such as gender, migration background and social origin; computers include desktop computers, laptops and tablets; primary level: Children aged 8 and over

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



The survey results provide information on the type of digital aids used and the intensity of use. At primary level, almost 50% of pupils reported daily computer use at school in the 2023/24 school year (→ Figure 61). Daily use included pupils who only used an iPad once or twice in one subject, as well as children who used digital learning programs in every lesson of a school day. However, the latter is very unlikely, as the use of digital aids only focused on individual school subjects (*Oggenfuss & Wolter, 2024*). Daily usage rates differed significantly between primary and lower-secondary level at all times. There were also statistically significant developments over time within the education levels. For example, a decline in daily computer usage (desktop, laptop and tablet) was recorded at primary level in 2021, following the temporary school closures. The intensity of use of digital media in primary level teaching has so far only changed slightly between the survey dates. No clear trend towards more intensive computer use is emerging (*Oggenfuss & Wolter, 2024*). At the same time, the use of digital aids in schools is being viewed critically, particularly with regard to the possible negative effects of increased screen time on the cognitive, social and physical development of children (→ *chapter Compulsory education, page 33*).

Post-COVID-19 and developments in school performance

At the start of the COVID-19 pandemic in 2020, the absence of face-to-face teaching led to the introduction of distance teaching across the country. The short- and long-term impact of school closures on school performance varies depending on the country and the study (*Bethhäuser et al., 2023; Contini et al., 2022*). This is also related to the fact that the duration of school closures varied greatly. In addition, it was found that particularly in those countries where pupils had already performed poorly before the pandemic, schools were closed for a long time (*Donnelly & Patrinos, 2021*).

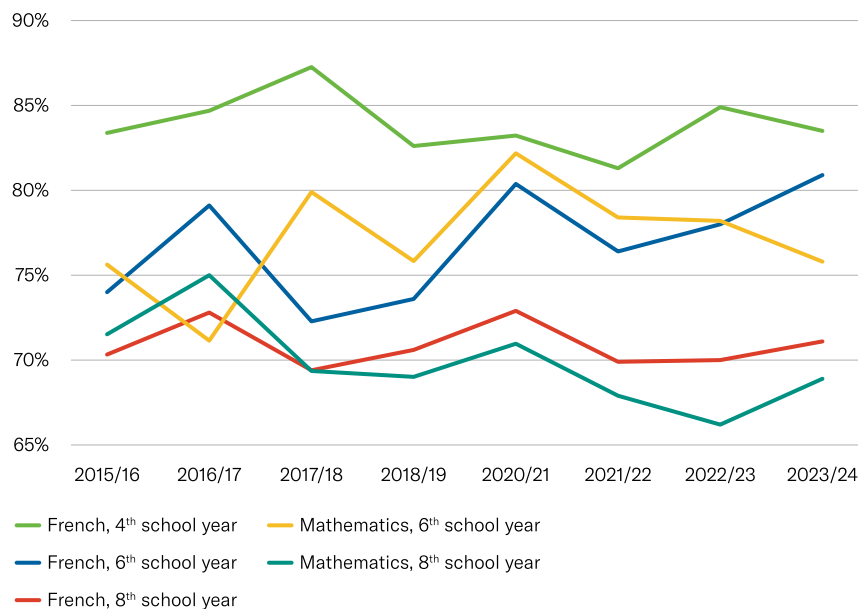
Universal statements are also difficult for Switzerland. Although learning assessments are now being carried out regularly again in various cantons, modifications to the measuring instruments and test times make it difficult to reliably compare the results before and after the pandemic

(Brauchle et al., 2024; SCCRE, 2023). However, individual cantonal evaluations provide no indication that the school closures may have had a negative impact on school performance in the short term (Compagnoni et al., 2025; Petrucci, Denecker et al., 2022). This applies to the analyses in the French-speaking part of the canton of Fribourg (→ chapter Lower-secondary education, page 85), in the canton of Vaud and in the cantons of Northwestern Switzerland. In the canton of Vaud, there was even a slight improvement in performance immediately after the school closures; by the 2023/24 school year, however, inconsistent trends were identified, depending on the school subject and grade level (→ Figure 62).

62 Test result fluctuations, Canton Vaud

The figure shows the average share achieved of the maximum possible points; there were no surveys in the 2019/20 school year.

Data: Canton of Vaud

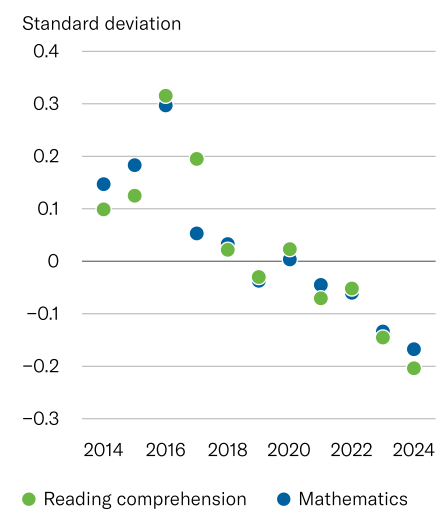


There was also a slight increase in performance in Northwestern Switzerland in 2020 compared to 2019. However, as a downward trend has been observed since 2016, a loss in performance would also have been expected for 2020. Since 2021, the results in reading comprehension and mathematics once again indicate a deterioration in average performance (→ Figure 63). Overall, however, the fluctuations in performance over the years in both cantons are greater than the impact of school closures. For this reason, no direct conclusions can be drawn regarding the impact of the school closures. Overall, it can be assumed that cohort-specific effects, measurement errors or a general decline in performance (OECD, 2023a) over the years have led to significantly greater changes than the deviations observed in the year of school closures.

63 Development of test results in the Northwestern Switzerland education area

Deviations from long-term average per test subject

Data: BR NWCH (Check P5); calculations: SCCRE



Efficiency/costs

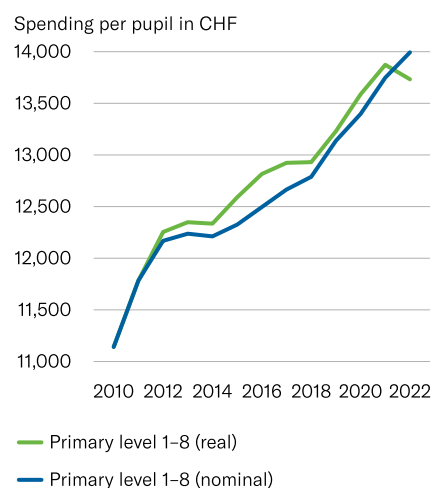
In order to adequately assess the efficiency of the primary level, comparable data on real and monetary inputs as well as output indicators are required, in other words, performance measures for all pupils in as many areas of competence as possible. Although Switzerland has good data on real and monetary inputs (such as educational expenditure, class sizes), it is not always at the desired level of aggregation or of a representative nature. For example, there is a lack of detailed information at school level, meaning that comparisons are only possible at cantonal level. In addition, only a few educational objectives (output) are regularly reviewed, which makes a comprehensive efficiency assessment difficult and in some cases impossible. The differences between the real inputs (class sizes, student-teacher ratios and repetitions) and between the costs are therefore shown below without linking them to the outputs.

Development in public education expenditure

64 Development of public education spending, 2010–2022

Primary level, 1st–8th school year; public and private institutions; excluding special needs schools and music schools; nominal and real (deflation-adjusted with CPI 2010); only staff remuneration (teachers' salaries and salaries of other staff)

Data: FSO; calculations: SCCRE



The statistics on public spending for primary level education are based, as for the entire field of compulsory education, on calculations that take account of payments made at municipal and cantonal level. These expenses are consolidated,⁷ which is why the aggregated figures are only known after a considerable delay. Since cantonal spending has only been calculated according to a uniform cost accounting model for the last few years, only certain categories of expenditure are considered for which the maximum possible degree of comparability can be assumed. This includes figures on staff pay or for teachers' pay. On average, real education costs in Switzerland between 2011 and 2022 per schoolchild at primary level (1st–8th school year) have risen by 33% (→ Figure 64).

Looking at public expenditure on education (teachers' remunerations only) per pupil in compulsory education for each canton, there has been a real increase since 2011 in almost all cantons – with only a few exceptions. Cantons that invest higher amounts for each schoolchild often also have above-average high educational expenditure per taxpayer aged 20 and over. At the same time, in some cantons, education costs per adult taxpayer have fallen, despite rising spending per pupil. This is the case where the number of taxpayers has grown faster than the number of school-age children and young people since 2011. Investments in education therefore do not necessarily lead to higher expenditure per taxable person (→ Figure 65).

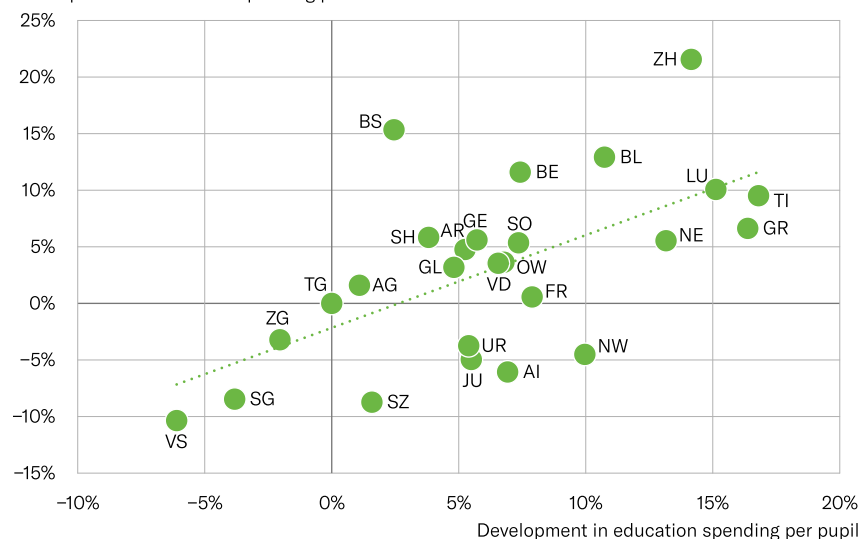
⁷ The accounts of individual households were consolidated into an aggregated financial statement by deducting the “internal” transfers between the units to be consolidated.

65 Development in public spending on education per pupil and adult, 2012/13–2022/23

Compulsory education, 1st–11th school year; only deflation-adjusted staff salaries; only public education spending per canton is only available for the entire compulsory school system and not broken down by level (primary and lower-secondary education); the deviation from the long-term average (2012–2022) is shown.

Data FSO; calculations: SCCRE

Development in education spending per adult



Development of class size and pupil numbers

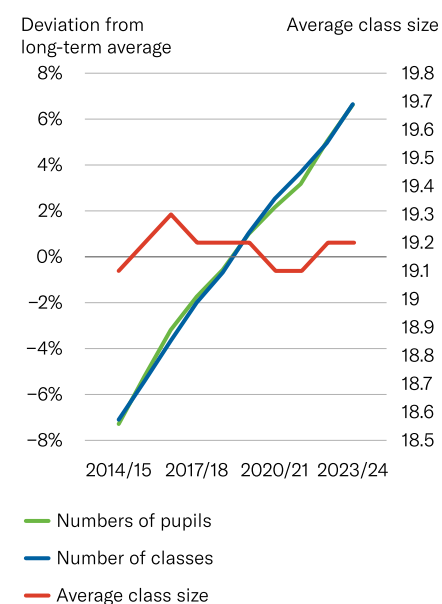
The average class size has remained constant over the past ten years with slight fluctuations between 19.1 and 19.3 and was 19.2 in the 2023/24 school year. At the same time, both the number of pupils and the number of classes at primary level (3rd–8th school year) increased (→ Figure 66). The fact that class size has developed independently of the development of pupil numbers shows that in the recent past it has not served as a buffer for the increase or decrease in pupil numbers. The consequence of this assessment is that with increasing pupil numbers at both primary and lower-secondary level, the existing classes were not enlarged, but rather new classes were created (→ *chapter Lower-secondary education, page 85*). This is also confirmed when the development of the large classes with more than 24 pupils is considered. Their number has fallen by 4% over the last ten years. On the other hand, the number of small classes (+6%) and middle classes (+15%) increased significantly during this period.

If we compare the development of average class size with that of pupil numbers by canton, we see different mechanisms emerging between the cantons (→ Figure 67). Almost two-quarters of the cantons with rising pupil numbers also reduced the average class size over the same period (quadrant II: such as Basel Landschaft, Thurgau). In other cantons, on the other hand, the rising number of pupils was offset by larger classes (quadrant I: such as Aargau, Appenzell Ausserrhoden). Overall, there is no strong correlation between average class size and the development of pupil numbers. In theory, teaching staff could have been reduced by 1,340 in the cantons in the second quadrant since 2014 if the student-teacher ratio had remained constant since then. This number of teachers corresponds to around 40% of an

66 Development of pupil numbers and class size

Primary level 3rd–8th school year; only mainstream classes in public schools; deviation from the long-term average (2014/15–2023/24), the two-year average is shown in each case

Data: FSO; calculations: SCCRE



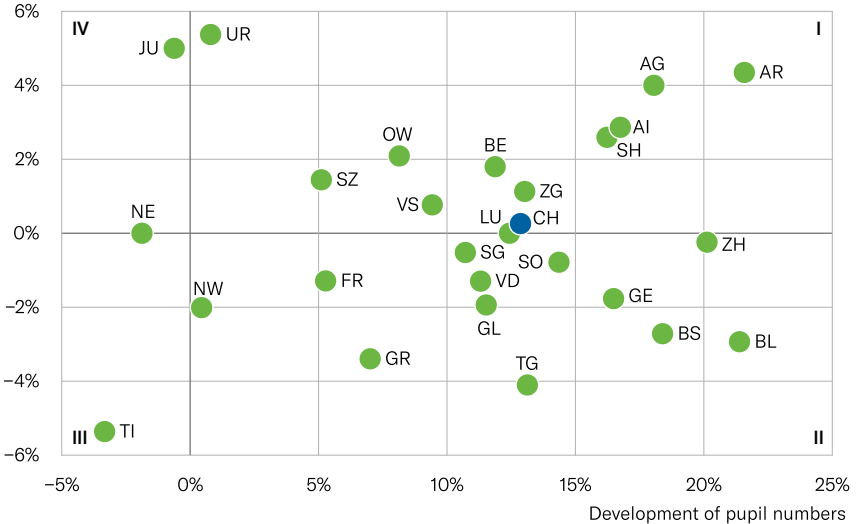
entry cohort in the primary level and pre-school degree programme at the higher education institutions (→ chapter Universities of teacher education, page 269).

67 Class size and pupil numbers by canton, 2014/15–2023/24

Primary level, 3rd–8th school year; only mainstream classes in public schools; classes made up of pupils at different levels of education are assigned to the level of education which the majority of pupils attend.

Data: FSO; calculations: SCCRE

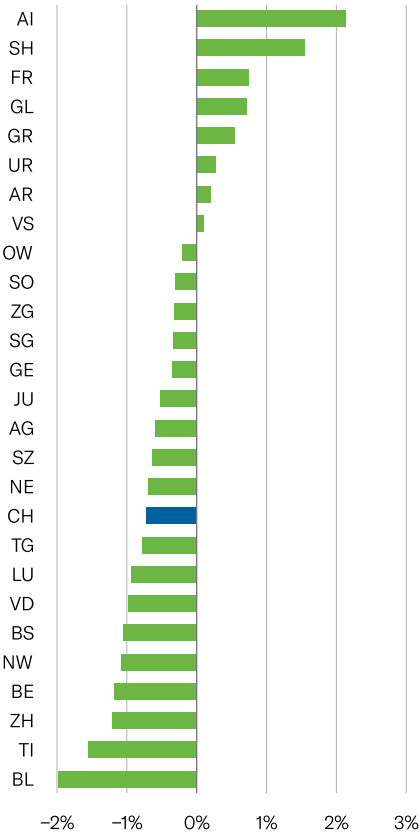
Development of average class size



68 Development of student-teacher ratio, 2014/15–2023/24

Primary level 3rd–8th school year; public schools, student-teacher ratio: Number of pupils per teacher in full-time equivalents (FTE)

Data: FSO; calculations: SCCRE



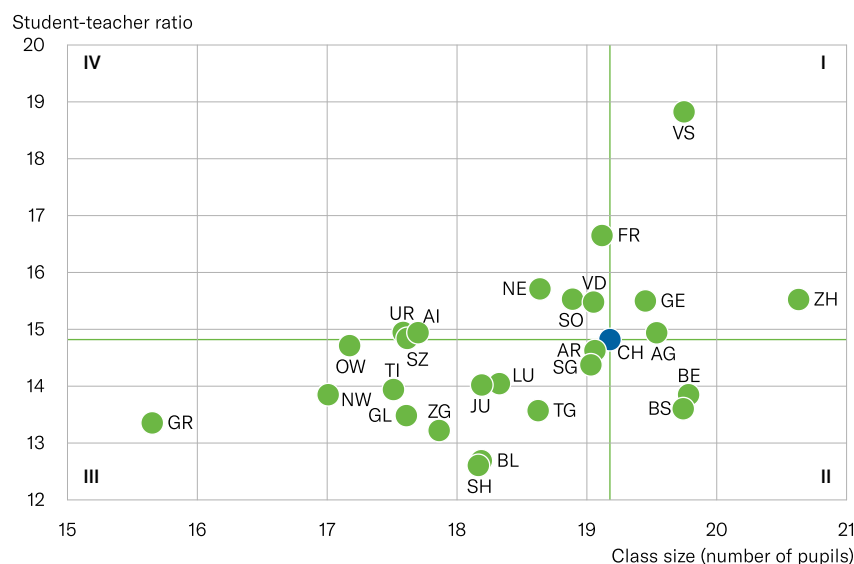
Student-teacher ratio and class size

It is not only class sizes that are decisive for education costs, but above all the student-teacher ratio, i.e. the number of pupils per teacher in full-time equivalents (FTEs). Large classes do not necessarily mean a poor student-teacher ratio, as several teachers can be deployed in parallel in a class at the same time for group work. Class size alone is therefore an insufficient measure for estimating costs. In the 2023/24 school year, the average class size at the primary level (3rd–8th school year) was 19.2 children. The average student-teacher ratio for the whole of Switzerland was 14.8 pupils per full-time equivalent of one teacher. Looking at the development of the student-teacher ratio by canton, the cantons of Basel Landschaft, Geneva and Thurgau, for example, show a reduction in class size as well as a reduction in the student-teacher ratio (in other words, an improvement) (→ Figure 68). In contrast, the cantons of Glarus, Fribourg and Grisons have declining class sizes, but this is offset by a higher student-teacher ratio. These different dynamics can also be shown in the cross-section of the 2023/24 school year (→ Figure 69). In some cantons, both class sizes and the student-teacher ratio are above the Swiss average (quadrant I: such as Valais, Geneva); other cantons, on the other hand, have below-average class sizes and below-average student-teacher ratios (quadrant III: such as Grisons, Nidwalden). In a third group of cantons (quadrants II, IV: such as Bern, Neuchâtel), class sizes and teacher-pupil ratios balance each other out.

69 Student-teacher ratio and class size at primary school level (3rd–8th school year), 2023/24

Mainstream classes in public schools; student-teacher ratio: Number of pupils per teacher in FTEs in public institutions.

Data: FSO



While it is clear on the cost side that both small classes and low student-teacher ratios cost more, the impact of these two factors on pupil performance is difficult to assess. International research on the effects of class sizes on pupil performance still shows little or no effect of small classes on pupil performance (*Angrist et al., 2019; Belfield, 2023; Filges et al., 2018; Leuven & Lokken, 2017*) or on school readiness (*Antoniou et al., 2024*). In addition, research on performance effects relates almost without exception to class size and not to the student-teacher ratio. It is therefore not possible to conclusively assess whether cantons with small classes and poorer student-teacher ratios or those with large classes and better student-teacher ratios are more cost-effective.

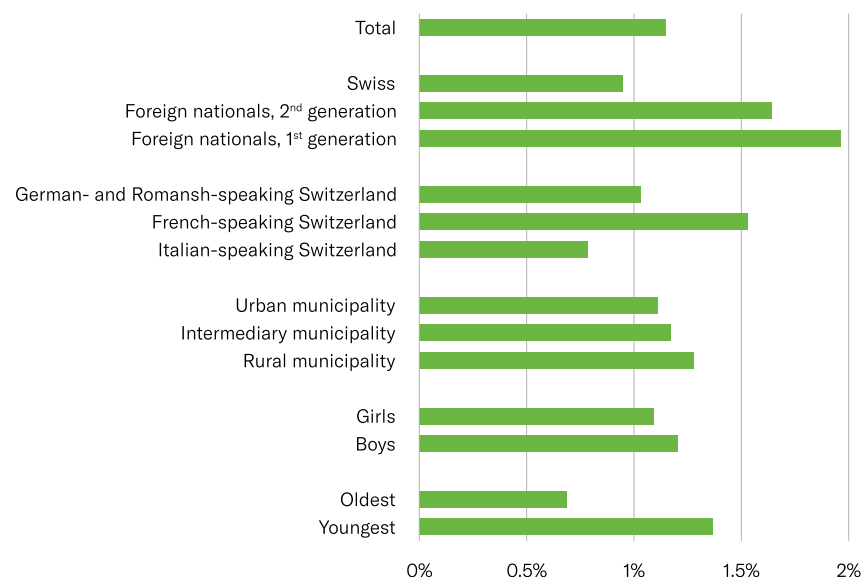
Education paths and repetitions

Without pre-school, primary school (3rd–8th school year) last six years. Around 91% of primary school pupils who started the 3rd school year in 2016 completed these six school years linearly in mainstream classes, with six consecutive graduations.⁸ 6.5% repeated at least one year, but always in mainstream classes (*FSO, 2025i*). 2.2% switched to a special needs class or special school at least once during their educational path. Of these, only just over a third (0.8%) returned to mainstream school. Almost half a percent switched to a foreign programme that is not based on the Swiss education system. The average annual repetition rate for all pupils in the 3rd–8th school year at primary level amounted to 1.2% in the period under review (→ Figure 70).

⁸ Pupils who skipped a year are also included in this 91% (*FSO, 2025i*).

70 Repetitions at primary levelPrimary level, 3rd–8th school year; annual repetition rate; three-year average (2019–2021)

Data: FSO

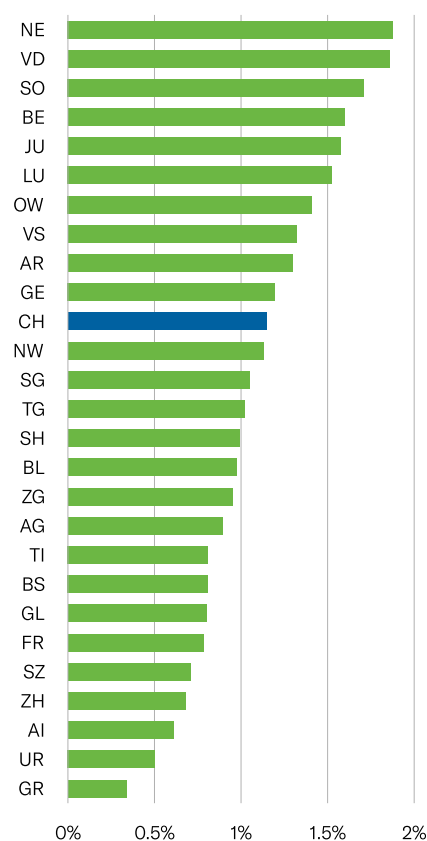
**Reading example**

First-generation foreigners repeat more than twice as often as Swiss nationals. Projected over their entire educational path, an average of 5.7% of Swiss nationals and 11.8% of foreign nationals repeat.

71 Annual repetition rates per canton, 3rd–8th school year

Three-year average (2019–2021)

Data: FSO



Boys, children with a migration background and pupils whose parents are less educated are more likely to repeat a year. However, regional differences are also noticeable: Repetition is most common in French-speaking Switzerland and in rural regions. An inter-cantonal comparison also reveals major differences between repetition rates, largely irrespective of how repetitions are institutionally regulated in the cantons (SCCRE, 2023). Of the four cantons (Basel Stadt, Nidwalden, Solothurn, Zug) in which repetitions are only possible under special personal circumstances, the canton of Solothurn lies above the Swiss average (→ Figure 71). Assuming that neither the effectiveness of a repetition nor its efficiency vary greatly from canton to canton, the major cantonal differences indicate that there are either too many repetitions in some cantons or too few in others. In view of the social and private costs, it would thus be worth taking a closer look at the effectiveness and efficiency of repeating a year.

Equity

Equity at primary level, as at all levels and types of education, is measured by the question of whether all pupils, irrespective of their gender, nationality and social origin, are able to exploit their academic potential in the same way. As it is practically impossible to determine individual performance potential, breaches of the equity principle can be identified if there are group-specific differences in performance that cannot be explained by group-specific differences in potential. For example, if girls and boys were

to have the same educational potential on average, persistent and inexplicable differences in performance between the genders would point to an equity problem. In the 2023 Education Report, the group-specific performance differences were examined for the first time based on the review of the national education objectives (ÜGK) at the end of the primary level. At the time this Education Report was written, the current data from the fourth wave of the survey of attainment of basic competencies was not yet available. The publication of this data and the accompanying Report is scheduled for mid-2026.

Diversity of nationalities in schools

Various performance surveys (such as PISA) show that pupils who speak a foreign language or come from educationally disadvantaged parents have a greater individual risk of poorer performance at school than their fellow pupils (*Hussmann et al., 2017; Mullis et al., 2016; OECD, 2021a; SCCRE, 2023*). In addition, the performance of these children can be further weakened if there are many foreign language-speaking or foreign children from educationally disadvantaged parents in the same class. These effects increase and, from a proportion of 40 to 50% of children with these characteristics, can also affect the academic performance of other children (*Balestra et al., 2022; Coradi Vellacott et al., 2003*). For this reason, the even distribution of these children and young people plays a major role. As shown in the 2023 Education Report, the distribution of foreign language-speaking pupils of foreign nationality at primary level is less balanced at school level than at class level (*SCCRE, 2023*).

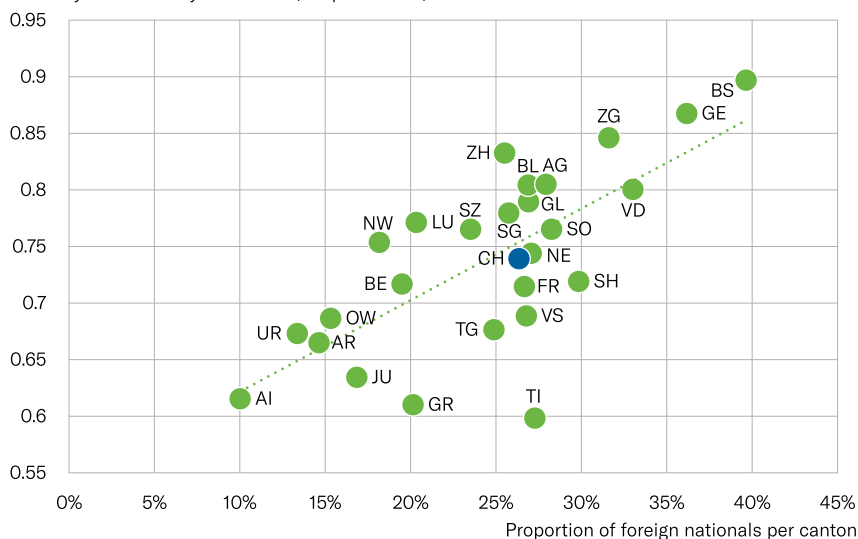
However, it is not only the proportion of foreign language-speaking pupils with foreign nationality that is decisive, but also the diversity of nationalities within a school (*Alesina & Ferrara, 2005; Bazzi et al., 2019; Chuard et al., 2025; Jensen & Rasmussen, 2011*). A high level of heterogeneity can have positive effects on social and other non-cognitive skills (such as intercultural communication skills and teamwork) (*Pregaldini et al., 2025*), but at the same time affect the academic performance of foreign and Swiss pupils. A mixed, not overly homogeneous composition, on the other hand, promotes social integration and the need to use the common school language (*Ballatore et al., 2018; Chuard et al., 2025*). The composition of a school class is therefore of great significance, both for the criterion of effectiveness as well as for equity. An analysis of the administrative data shows that cantons with a high proportion of foreign pupils also tend to have a greater mix of the group of foreign and foreign-language pupils (→ Figure 72). In these cantons, the question of the extent to which a culturally diverse student body goes hand in hand with a culturally diverse teacher body would be of particular interest (→ *chapter Universities of teacher education, page 269*).

72 Diversity of nationalities at primary schools, 2022/23 school yearPrimary level, 3rd–8th school year; only public institutions, excluding special needs schools

Data: FSO (LABB); calculations: SCCRE

Diversity of nationality in schools (Simpson index)

The Diversity Index (Simpson Index) measures the probability that two randomly selected students from one class belong to different ethnic groups. The Index (diversity of nationalities) assumes a value between 0 and 1. A higher value means more diversity (more even distribution of nationalities). A lower value means less diversity (a dominant group is strongly represented) (Ballatore et al., 2018).

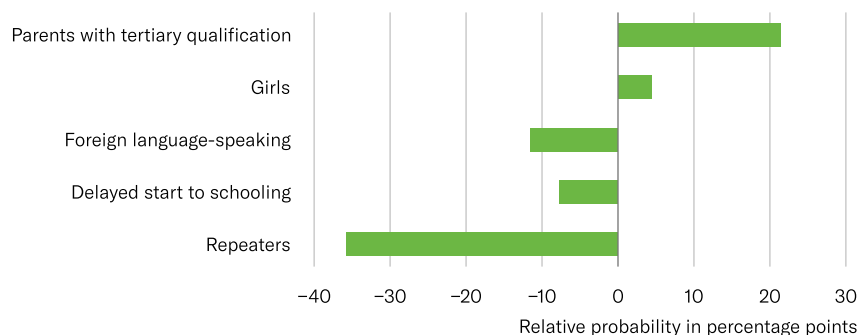
**Transitions to classes with advanced requirements**

The organisation of lower-secondary education varies from canton to canton – the shared, cooperative and integrated models exist (→ *chapter Lower-secondary education*, page 85). For many children in cantons with different requirements levels (also known as requirements profiles), the end of the primary level is therefore a decisive point in their educational path. A decision is made as to whether to transfer to a class with advanced requirements or to one with basic requirements. This decision is particularly important, especially as it has been observed in the past that children from socially privileged families with the same performance as their fellow pupils have a higher probability at the end of the primary level of attending a class with advanced requirements (Coradi Vellacott et al., 2003; Ramseier & Brühwiler, 2003; SCCRE, 2023). This is also reflected in findings that indicate that foreign language-speaking and socio-economically disadvantaged pupils in highly structured school systems are overrepresented in classes with the lowest requirements, even with the same performance (Batruch et al., 2019; Felouzis & Charmillot, 2023) (→ *chapter Lower-secondary education*, page 85).

73 Transition to classes with advanced requirements at Lower-secondary level, 2022

Public school; education of parents is based on a sample; all effects listed are highly significant; controlled by gender, nationality, language, repetition, delayed start to schooling and highest level of education of parents

Data: FSO (LABB); calculations: SCCRE



Reading example

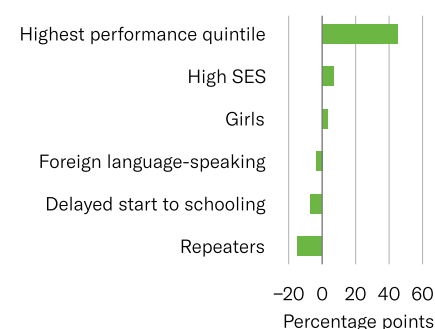
The graph shows the relative probability of each influencing factor in a group comparison. Children with a class repetition are 33.5 percentage points less likely to move to a class with advanced requirements than children without a repetition. This means that children who have repeated a class only have a 33.9% probability of entering a class with advanced requirements. For children who did not repeat a class, the probability is 69.6%.

In the 2022/23 school year, on average, around 66% of pupils transferred to a class with advanced requirements. Here too, it can be seen that gender, parents' education and the language spoken at home have a significant impact on the transition to a class with advanced requirements (→ Figure 73). In the ten German-speaking cantons (Appenzell-Outer Rhodes, Glarus, Grisons, Lucerne, Nidwalden, Obwalden, St. Gallen, Uri, Zug and Zurich) where pupils can enter a long-term baccalaureate school directly after primary level, the probability of entrance depends heavily on the parents' educational background (→ *chapter Baccalaureate school, page 151*). The effects for foreign language-speaking children, for repeaters and for children of parents with a tertiary qualification are more pronounced if the performance⁹ at the end of primary level cannot be checked, as was the case for the 2017 cohort review of the national education objectives (ÜGK) in the 2023 Education Report (→ Figure 74). The lack of standardised performance data is therefore also a problem in identifying equity issues. It is not possible to distinguish between primary source effects – effects that affect performance – and secondary source effects – effects that also affect selection when performance is taken into account (*Angelone, 2022*).

74 Transition to classes with advanced requirements, 2017

ÜGK cohort 2017; estimated probability; basic competencies taken into account in the reading performance of the school language and in the first foreign language

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE



SES Socio-economic background

Gender and support for talented and gifted pupils

While data has been collected in Switzerland for several years now on pupils in special needs schools or special needs classes as well as with enhanced measures or adapted learning objectives, no specific information is

⁹ "Performance" refers to standardised external performance tests. Grading (assessment) by teachers can be systematically biased (*Oggenfuss & Wolter, 2025; Zanolla & Petrucci, 2024*).

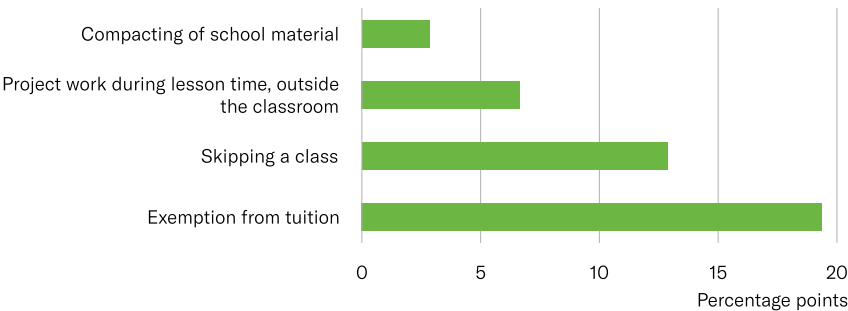
available on the nature of the enhanced measures. In various cantons, some of the enhanced measures are also being used by particularly gifted (highly gifted)¹⁰ children and young people¹¹.

Promoting talent at school helps gifted children and young people to develop their individual strengths further. Recognising talents is key, as permanent lack of challenge can have a negative impact on both well-being as well as on personality and performance development (*Preckel & Vock, 2021*). In addition to various cantonal reports on offers for the advancement of talented and gifted pupils, recent analyses on this topic show that boys in German-speaking Switzerland make use of offers for the advancement of talented and gifted pupils considerably more often than girls (*Corbett et al., 2008; Meier et al., 2024*) (→ Figure 75). These results are consistent with international studies showing that boys are more likely to be classified as gifted and therefore more likely to participate in appropriate programmes (*Bianco et al., 2011; Petersen, 2013*). The reasons for these differences are identified as identification methods (such as IQ tests, standardised tests or teacher recommendations), cultural and socio-economic factors or behavioural differences in research. Boys, for example, display behavioural problems more frequently, which leads to educational psychological investigations. This increases the likelihood of being diagnosed with intellectual giftedness.

75 Difference between boys and girls in the various offers in the area of the talent programme in percentage points

Status 2024

Data: *Meier et al. (2024)*



Reading example

In the case of children who skip a class, 43.6% are girls and 56.4% are boys.

¹⁰ Support for gifted pupils, in other words, the support of children and young people with special or above-average talents, has a special educational relevance if highly gifted pupils are under-challenged in the regular programme and in addition exhibit behavioural problems or other psychological problems, for example in the form of performance deficiencies (*Kronenberg, 2021*).

¹¹ However, the Federal Statistical Office (FSO) does not have any information on children with special talents.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

**CONTINUING EDUCATION
AND TRAINING**

LOWER-SECONDARY EDUCATION

Context

Forming part of compulsory schooling, lower-secondary education is the continuation of basic primary level education and prepares students for upper-secondary education once compulsory schooling has been completed. In school year 2023/24, the number of pupils at lower-secondary level was around 285,800, an increase of around 10% compared to 2017/18. According to the Federal Statistical Office (FSO), this growth will continue. At lower-secondary level, demographic developments led not only to an increase in the number of pupils but also to a change in the composition of the pupil population, particularly in terms of sociodemographic and socioeconomic characteristics.

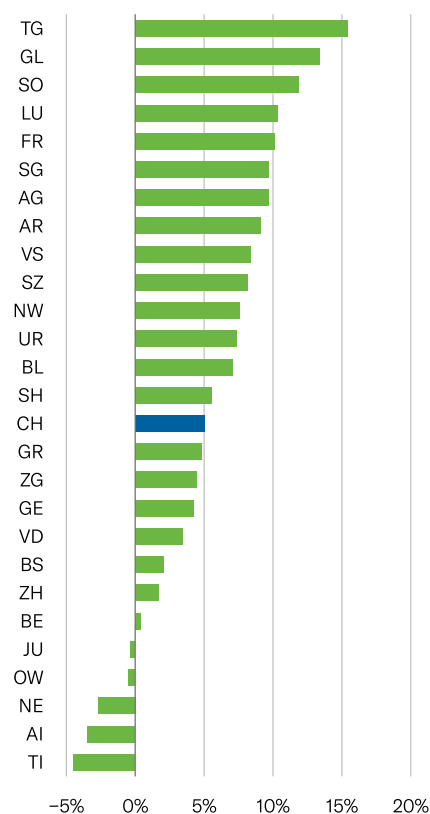
Development of pupil numbers

Having reached a low in school year 2017/18, the number of pupils at lower-secondary level rose again in subsequent years due to population growth in the relevant age group. According to the FSO reference scenario, we can expect a slowdown of growth of 5% in Switzerland as a whole to around 301,225 pupils at lower-secondary level from 2025 to 2034. This increase is due, among other things, to the influx of refugees from Ukraine in 2022. In addition to immigration and emigration, the birth trend will also influence the future number of pupils. The birth rate, which has been falling since 2022, will initially affect the primary school level from 2026 onwards (→ *chapter Compulsory education*, page 33; → *chapter Primary school level*, page 59). At lower-secondary level, this effect will only become noticeable from school year 2034/35. The expected trends vary greatly from canton to canton, as they are heavily influenced by the respective demographic conditions and migratory movements. According to the FSO reference scenario, falling pupil numbers are only expected in five cantons in the period up to 2034 (→ Figure 76).

76 Development of pupil numbers at lower-secondary level, 2025–2034

Reference scenario; including special needs classes, special schools and private schools

Data: FSO; calculations: SCCRE



Composition of pupil population at lower-secondary level

The main exogenous framework conditions for school and teaching include the educational and migration background as well as the first language – that language which the pupils first acquired in their family environment. The composition of the pupil population in lower-secondary education has changed significantly over the last ten years (→ Figure 77). In 2022, more than half of pupils had parents with tertiary education and thus had the same level of education as their children's teachers. The proportion of these pupils increased by 30% between 2012 and 2022. At the same time, the proportion of foreign-language-speaking pupils also increased by around 30%. In 2012, a quarter of pupils had a first language other than the school language, while in 2022 it was a third. Within this group, the proportion of those born abroad has increased (from 22% in 2012 to 30% in 2022).

The composition of the pupil population is relevant for two reasons: On the one hand, pupils with what are known as risk factors – such as an educationally disadvantaged or foreign-language-speaking family background – are more likely to experience difficulties at school (OECD, 2001; Ramseier

et al. 2002; SCCRE, 2018). On the other hand, their distribution within schools and classes has an impact on their own learning success as well as that of their fellow pupils. Studies show that the first negative effects on school performance can be identified if the proportion of pupils with risk factors in a class is 20%. These effects increase from a proportion of 40 to 50% and can then also affect the academic performance of the other children (Balestra *et al.*, 2022; Coradi Vellacott *et al.*, 2003). Not just the proportion of foreign pupils is decisive here, but also the diversity of nationalities within a school. While very pronounced heterogeneity can impair the efficiency of teaching, a mixed, not too homogeneous composition promotes social integration and the need to use the common school language (Ballatore *et al.*, 2018). The mix varies considerably depending on the canton and is positively correlated with the cantonal proportion of foreign pupils (→ *chapter Primary school level*, page 59). In addition, the composition of the pupil population in secondary schools tends to be more heterogeneous than in primary schools, which could be attributable to the central function and the larger catchment areas of lower-secondary education.

Institutions

Since the implementation of the HarmoS Agreement (EDK, 2007), lower-secondary education has consistently lasted three years – even in cantons that have not acceded to the Agreement. Canton Ticino, where lower-secondary education lasts four years, remains an exception. The introduction of Lehrplan 21 was completed in all cantons of German-speaking Switzerland in 2023. As a result, the term Cycle 3 has also become established for lower-secondary education in German-speaking Switzerland – this was introduced in French-speaking Switzerland around twenty years ago with the Plan d'études romand (PER). In most cantons, the school years are called the 9th to 11th school years, which is attributable to the inclusion of the first two years of kindergarten (→ *chapter Compulsory education*, page 33).

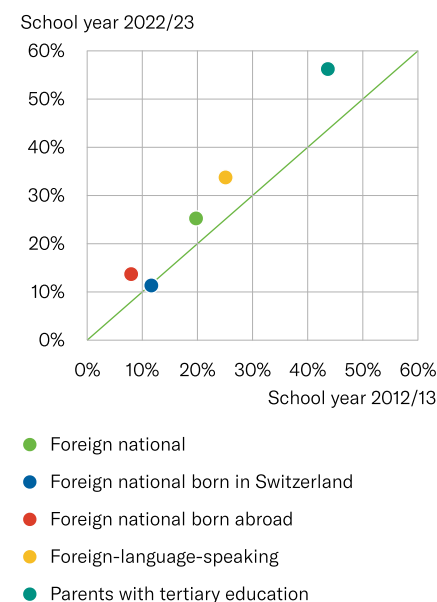
Lower-secondary education models

The organisation of lower-secondary education varies from canton to canton. Altogether, there are three different structural models (→ *margin text on the next page*), which select according to performance with varying degrees of intensity after primary school level. In around half of the cantons, only one model is approved, while the remaining cantons leave the choice between several models to the municipalities. Six cantons stipulate the streamed model. Whereas in fourteen cantons, either the cooperative or the integrated model is mandatory or the most widespread (→ Figure 78). Ten German-speaking cantons also offer long-term baccalaureate schools at lower-secondary level, which are directly linked to the primary school level. In most cantons, however, pupils transfer to baccalaureate school only after the 10th or 11th school year. In Cantons Aargau, Basel Landschaft and Basel Stadt, this is only possible after the 11th school year. In Italian-speaking Switzerland, the transfer also takes place after

77 Lower-secondary level pupils according to individual characteristics

Public schools including special schools; foreign-language-speaking: First language does not correspond to the school language; education of parents: at least one parent with a tertiary education qualification (based on a sample)

Data: FSO (LABB); calculations: SCCRE



Reading example

In the 2012/13 school year, 20% of the pupil population at lower-secondary level were foreign nationals (x axis). In the school year 2022/23, this proportion was 25% (y axis), marked in green.

In the **streamed model** pupils are assigned to two or three different requirement levels (also known as a profile or department) based on an overall assessment. All subjects are taught separately. The requirement levels are called, for example, “Realschule”, “Sekundarschule” or Levels A, B, C.

The **cooperative model** usually comprises two streamed core classes. The allocation process is the same as for the streamed model. Mathematics, the teaching language and, in some cases, also foreign languages are taught in level-based courses that span the core classes.

The **integrated model** does not use performance-based selection. The class composition of the primary school level will be maintained. Mathematics, teaching language and in some cases also other subjects, are taught in level-based courses that span classes.

the 11th school year – with the exception of Canton Valais, which also offers a transition after the 10th school year (→ *chapter Baccalaureate school, page 151*).

78 Most common model at lower-secondary level, 2023/24

Data: EDK-IDES

Model	Cantons
Streamed	AG (3), AI (2)*, BL (3), BS (3), FR (3), GE (3), GL (3)*, SG (2)*, SH (2), SO (3), SZ (2)
Cooperative	BE, GR *, TG, VD , ZG*
Integrated	AR, JU , LU*, NE , NW*, OW*, TI , UR*, VS

The cantons marked (*) also offer a long-term or lower baccalaureate school; in bold: only one model is permitted in the relevant canton; in brackets: Number of requirement levels. AR: Cooperative and integrative models occur with roughly equal frequency. ZH: The majority of pupils attend a class in the cooperative or streamed model.

Dividing pupils into a homogeneous learning environment can make it easier to teach skills, as both content and teaching methods can be better adapted to pupils’ needs. However, the desired homogeneity of performance can only be guaranteed with the appropriate allocation. Misallocations can thus reduce the desired benefit of the structured model. On the other hand, it is possible that lower-performing or less academically-oriented pupils in homogeneous classes lack an atmosphere conducive to learning if higher-performing classmates are assigned to other classes. Research regularly investigates the relationship between the degree of selection in the school system and performance as well as between performance and the pupils’ family background. The studies predominantly show that foreign-language-speaking and socioeconomically disadvantaged pupils are overrepresented in classes with the lowest requirements in highly structured school systems, even with the same performance (*Batruch et al., 2019; Felouzis & Charmillot, 2023; Matthewes, 2021; Strello et al., 2021*). In addition, the performance development of pupils with comparable characteristics and requirements varies depending on the level of requirements of lower-secondary education (*Angelone, 2019; Petrucci, Fouquet- Chauprade et al. 2022, Petrucci et al., 2024*). At the same time, a comprehensive meta-analysis shows that school systems with a high selection do not achieve a higher average performance (*Terrin & Triventi, 2022*). However, the examination of school reforms as a natural experiment in which selective models were replaced by non-selective models revealed that under-performing pupils developed a deeper school self-concept in the integrative model than in the selective model, while this remained unchanged for high-performing pupils (*Fleischmann et al., 2023*).

Permeability and change in level of requirement

A change in requirement levels is permitted in all school models to correct misallocations and ensure permeability. As the cooperative and integrative models allow for individual subjects to be switched after even one semester, these models are considered to be more permeable than the streamed model. With the available national data, it is not possible to show for Switzerland how many pupils change the level of requirement. In particular, it remains unclear whether changes between requirement levels are reflected in the statistics on a comparable basis in all three school models. Accordingly, it is not possible to find out in which school model such changes occur more frequently or less frequently. In cantons that only allow the streamed model of lower-secondary education, around 5% of pupils change level after the first school year. Changes are made with the same frequency upwards (in classes with higher requirements) as downwards (in classes with lower requirements). Girls and boys are also affected by changes in equal measure, with boys switching slightly more often to classes with lower requirements (→ Figure 79). Compared to non-foreign-language-speaking pupils, foreign-language-speaking pupils change their level more frequently overall, while non-foreign-language-speaking pupils change to a lower requirement level more frequently.

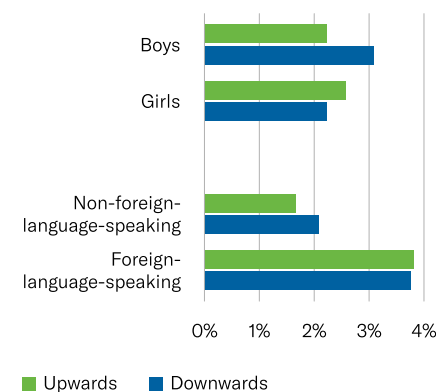
Pupils by requirement level

In education statistics, regardless of the model, pupils are divided in simplified terms into two requirements levels – classes with basic requirements and classes with advanced requirements. In the cooperative and integrative model, classification is based on the level courses attended or on the number of courses attended in the corresponding requirement level. Between 2017 and 2022, the distribution of pupils across the requirements levels remained largely stable in Switzerland. 27% attended classes with basic requirements, 66% classes with advanced requirements and around 7% were assigned to the category “without selection” (in cases where an allocation could not be made). The distribution varies widely between the cantons, even with similar school models. In Canton Fribourg, around 21% of pupils attended a class with basic requirements in school year 2022/23, compared with 42% in Canton Glarus. Viewed over the years, the cantonal variance has not diminished. A look at developments between 2012 and 2022 shows rather that the differences between the cantons are more pronounced than the fluctuations within an individual canton (→ Figure 80). Major changes have been observed in some cantons. These are either the result of the increase in integrative school models or can be traced back to a change of system. In Basel Stadt, for example, as part of a structural reform, CET schools with the integrative model have been abolished and replaced by streamed models at lower-secondary level.

79 Level change at lower-secondary level

Cantons that only allow the streamed model (AG, BL, BS, FR, GE, SO); change after 1st year, 2018–2021 cohorts; foreign-language-speaking: School language is not the first language

Data: FSO (LABB); calculations: SCCRE



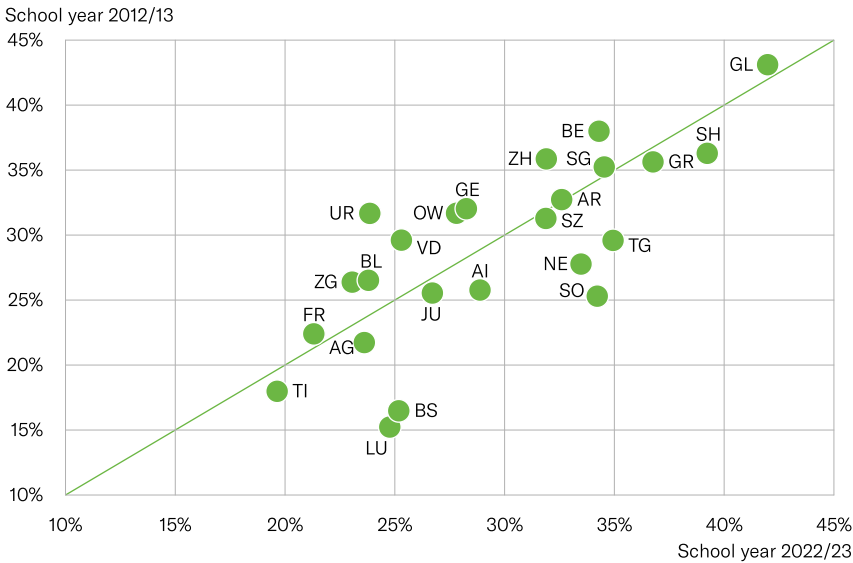
Reading example

In the school year 2012/13, 22% of students in Canton Fribourg attended a class with basic requirements. In the school year 2022/23, this figure was 21%.

80 Proportion of pupils in classes with basic requirements

School year 2012/13 and school year 2022/23; excluding Cantons Nidwald and Valais: Adjustment of statistical recording

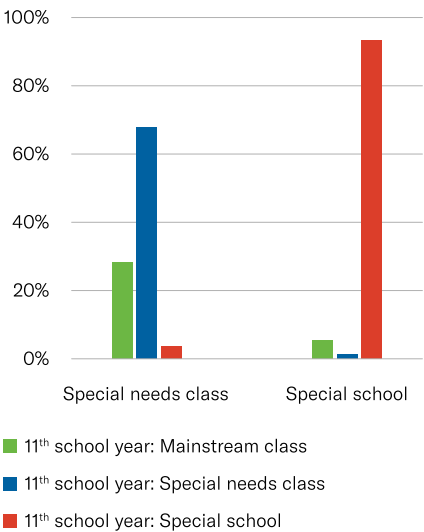
Data: FSO (LABB); calculations: SCCRE



81 Return to a mainstream class and continuing in special settings

Distribution of pupils in the 9th school year who attended a special needs class or special school, after schooling in the 11th school year (mainstream class, special needs class or special school); cohorts 2017–2022

Data: FSO (LABB); calculations: SCCRE



Pupils with individual support needs

The proportions of pupils with individual development needs and those of separately educated children and young people in special needs classes or schools vary widely between the cantons (→ *chapter Primary school level, page 59*). Differences are also apparent at the different educational levels. Viewed in a cross-section, the proportion of pupils in special needs classes and schools increases at the transition from primary to lower-secondary level. Longitudinal data confirms that this increase is related to the low return rate of pupils who transfer from separate settings to mainstream classes. This leaves 63% of pupils who are in a special needs class in the 9th school year continuing in a special needs class up to the end of lower-secondary education. Their probability of returning to a mainstream class is 28%. This is even more pronounced in the case of pupils in special schools. 93% of pupils in a special school in the 9th school year remain in this form of school until the end of the stage, while only 5% return to a mainstream class (→ Figure 81). Differences in terms of gender and migration background can already be observed at primary school level, and are further exacerbated by the low rate of return to mainstream classes at lower-secondary level. Boys and pupils with a migration background are much more likely to receive separate schooling than their fellow pupils without these characteristics (FSO, 2025e; Lanners, 2024).

A look at the development between 2017 and 2022 shows (→ Figure 82) that the proportion of pupils in classes for foreign language speakers increased at lower-secondary level, while that of pupils in special needs classes declined.¹ At the same time, a slight increase was observed in the

¹ For an overview of the development of the integration and separation rate for all compulsory education, see Lanners (2024).

proportion of pupils attending a mainstream class. This could indicate increased efforts at integration, particularly as the absolute number of pupils has increased with enhanced measures (→ *chapter Primary school level, page 59*). According to the latest research results, inclusive schools with heterogeneous classes score better than separate school forms, both in terms of academic performance as well as later integration in the labour market. This applies to children with development needs as well as to particularly gifted children (*Balestra et al., 2022; Sallin, 2021*). It remains unclear how specific integrative support measures are connected with school performance and the individual's perceived integration. Studies on primary and lower-secondary levels indicate that reduced learning goals are associated with poorer performance at school, while compensation for disadvantages correlates positively with academic performance (*Sahli Lozano et al., 2022; Sahli Lozano et al., 2024*). At the same time, the findings of these studies show that compensation for disadvantages is granted more frequently to children with a higher socio-economic background, while reductions in learning objectives tend to affect children with a lower socio-economic background.

Effectiveness

To evaluate the effectiveness of lower-secondary education, it would be necessary to review a wide range of educational objectives of the compulsory school system that should be attained by the end of compulsory schooling. In Switzerland, at lower-secondary level, as at primary school level, the focus is on achieving basic competencies in mathematics and languages (→ *chapter Compulsory education, page 33*). In addition to specialist knowledge and digital skills, the educational mandate of the compulsory school also encompasses general skills such as political education, education for sustainable development as well as personal and social skills, which are also referred to as non-cognitive skills. The smooth transition to upper-secondary education (→ *chapter Upper-secondary education, page 111*) is a further criterion for the systematic and individual assessment of the effectiveness of lower-secondary education. This question is also central because the Confederation and cantons have formulated the education policy objective of 95% of all 25-year-olds completing an upper-secondary education (*EAER & EDK, 2023*).

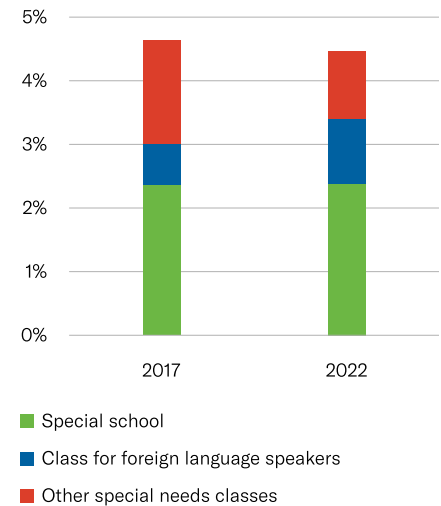
Review of basic competencies in the area of languages

For basic skills in languages, mathematics and natural sciences, the Swiss Conference of Cantonal Ministers of Education (EDK) formulated national education goals in 2011. Since 2016, these have been reviewed four times throughout Switzerland in the fields of mathematics and languages as part of the review of the national education objectives (ÜGK) (→ *chapter Compulsory education, page 33*). At the end of lower-secondary education, the basic skills in mathematics (*Konsortium ÜGK, 2019a*) were tested in 2016 and those in the school language (reading comprehension and spelling) and in the first and second foreign languages (reading and listening

82 Proportion of pupils in separate settings 2017 and 2022

Only lower-secondary level; prior to 2017, a clear assignment to the level of education or to the categories shown here was not possible.

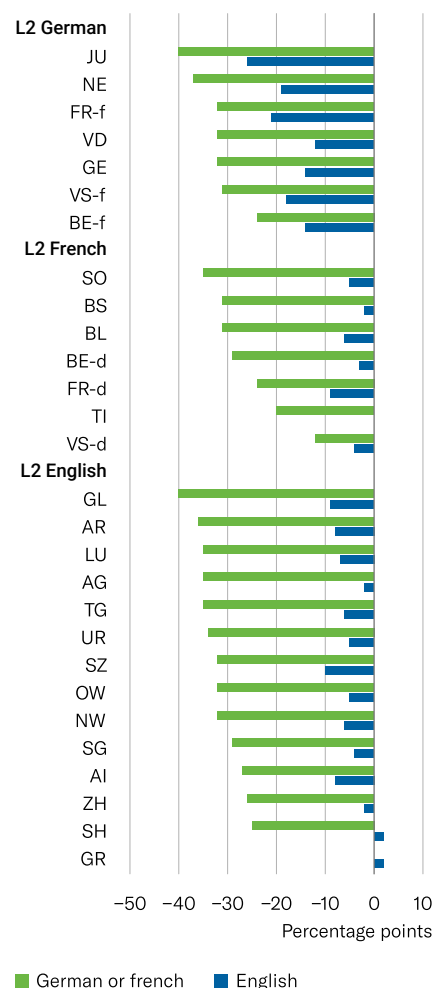
Data: FSO (LABB); calculations: SCCRE



83 Basic competences in languages, 11th school year

Reading comprehension only; the difference from the school language is shown, based on the proportions of pupils who have achieved the basic competencies; national language: German or French regardless of whether L2 or L3; English: regardless of whether L2 or L3

Data: *Erzinger et al. (2025)*



TI: English was not tested

(L2: French, L3: German)

GR: French was not tested

(L2: one of the cantonal languages, L3: English)

Reading example

In the Canton of Vaud, the difference in German (L2) is 32 percentage points (green), i.e., the difference between 86% of students achieving the basic competencies in French (L1) and 54% achieving them in German as a second language (L2). In English (L3), the difference is 12 percentage points (blue; 86%–74%).

comprehension) were tested in 2023 (*Erzinger et al., 2025*). Taking into account skills in the school language, the results on foreign languages show that fewer pupils achieve the basic skills in the other national language than in English in all cantons – regardless of the order in which the foreign languages are introduced (reading comprehension only). In the French-speaking cantons, the proportion of pupils with achieved basic skills in English is also lower than in the German-speaking cantons, where English is also taught as a second foreign language (→ Figure 83).

International comparison of PISA results since 2003

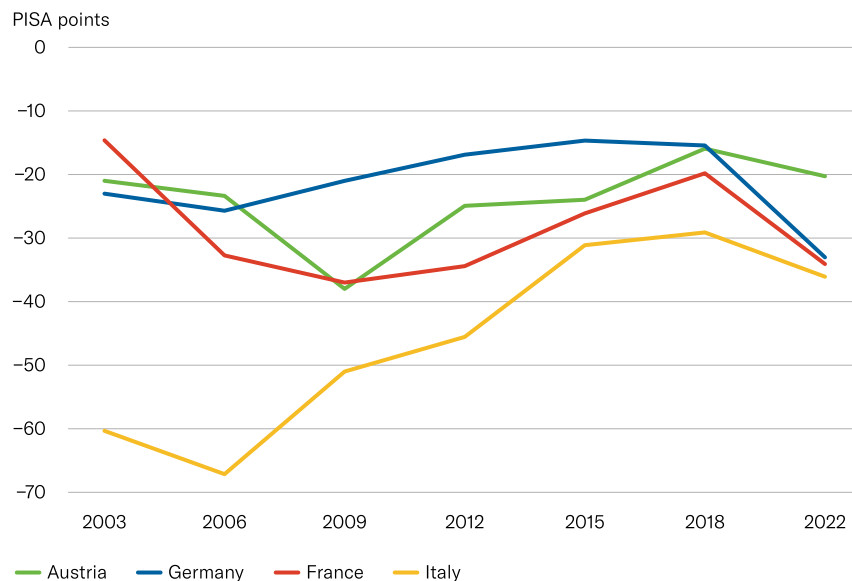
The PISA study remains the only way of comparing the performance of the Swiss education system internationally. Because skills are recorded using the multi-level competency grid, the results also allow various analyses to be performed at a national level which would not be possible without this data basis. When the assessment of basic skills commenced, the cantons stopped taking part in the PISA study with additional samples (with the exception of Canton Ticino), which is why cantonal comparisons on the basis of this data are no longer possible (until 2012 there were representative samples for ten cantons).

Although the results of 15-year-olds in Switzerland have deteriorated in all three areas over the past twenty years (*Erzinger et al., 2023*), over the entire period they still achieved better results than their peers in neighbouring countries. Although, in mathematics, they performed best in all surveys (→ Figure 84), their lead over pupils in the neighbouring countries has declined. In the natural sciences, Switzerland achieved better results than its neighbouring countries in 2003 and 2022. In the intermediate surveys, the performance of pupils from Germany was slightly higher than the Swiss result (→ Figure 85). In reading, pupils in Switzerland achieved the best result until 2012. They were subsequently overtaken by Germany and France, but in 2022 their performance was once again similar to that of the five countries (→ Figure 86).

84 International comparison of PISA performance in mathematics

Deviation from the Swiss result in PISA points; in Austria there was a change in the sample after 2000, which is why the results from 2003 are presented.

Data: OECD (PISA); calculations: SCCRE



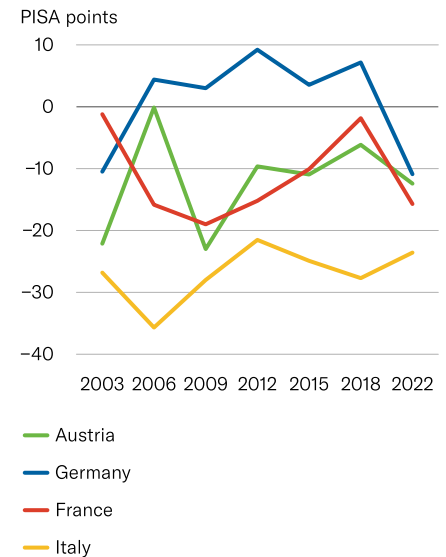
Comparison of Swiss PISA samples from 2015 to 2022

The PISA results deteriorated significantly in almost all OECD countries between 2015 and 2022. While pandemic-related school closures are cited as a possible cause for the decline in performance in some countries, this explanation is not sufficient to explain the overall decline, especially as negative trends were already emerging before the COVID-19 pandemic (OECD, 2023a). Switzerland also recorded a decline in pupil performance in all tested competence areas between 2015 and 2022. A key question is therefore whether skills have actually declined or whether the decline is due to a changed population of 15-year-olds. The composition of Switzerland's PISA sample changed between 2015 and 2022 such that an increase in performance could actually have been expected. The proportion of pupils with at least one parent with tertiary education increased from 64% (2015) to 81% (2022), while the proportion of those who speak the school language at home fell only slightly from 54% to 49% (→ *chapter Equity, page 104*). Given the positive correlation between socioeconomic status and school performance, this should have led to an improvement in PISA results. If the results of the 2022 study are estimated assuming that the sample composition would have been the same as in 2015, the decline in performance becomes even more pronounced. Without this more favourable sample composition, the results would have been correspondingly worse (→ Figure 87).

85 PISA score in natural sciences, 2003–2022

Deviation from the Swiss result in PISA points; in Austria there was a change in the sample after 2000, which is why the results from 2003 are presented.

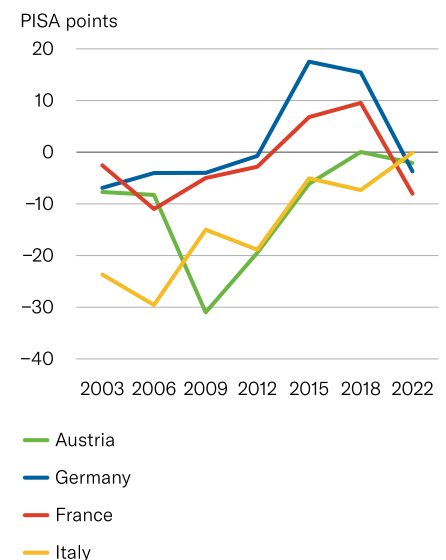
Data: OECD (PISA); calculations: SCCRE



86 PISA reading performance, 2003–2022

Deviation from the Swiss results in PISA points; in Austria there was a change in the sample after 2000, which is why the results from 2003 are presented.

Data: OECD (PISA); calculations: SCCRE

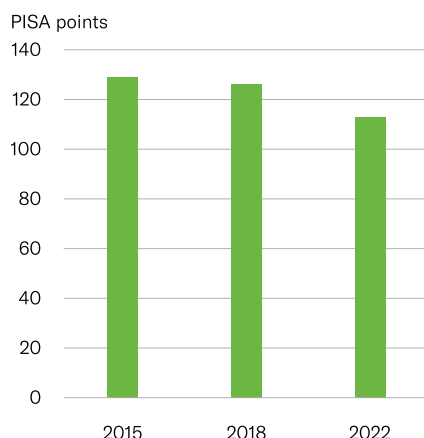


The comparison is limited to the surveys for 2015, 2018 and 2022, as the PISA surveys from 2015 onwards were computer-based. In addition, the OECD made methodological adjustments to the measurement procedures from 2015.

88 Performance difference in mathematics by year of education

Difference in PISA mathematics performance between 15-year-olds in the last year of compulsory education and peers in the second year of upper-secondary education

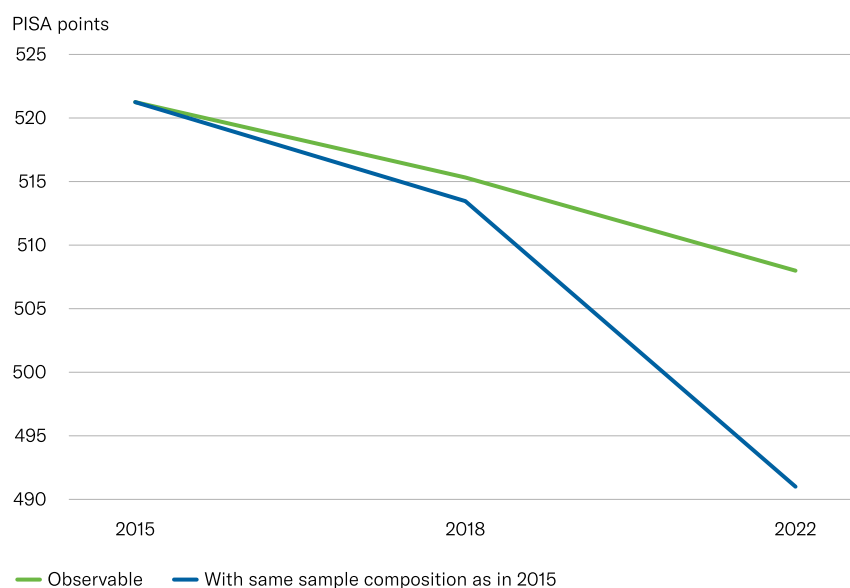
Data: OECD (PISA); calculations: SCCRE



87 PISA results of Switzerland in mathematics, 2015–2022

Observed average PISA points in mathematics and estimated average PISA points in mathematics assuming that the sample composition in 2018 and 2022 would have been the same as in 2015.

Data: OECD (PISA); calculations: SCCRE



A key aspect not taken into account in the estimate is the standardisation of school starting age in Switzerland, which has led to a gradual bringing forward of the cut-off date in several cantons since 2009. As a result of their earlier schooling, 15-year-olds continued on average in their educational path in 2022 and thus had a longer period of schooling than the 2015 cohorts. This significantly changed the distribution of 15-year-olds across the various school years and makes comparability more difficult. In 2015, the majority of the sample (61%) was in the 11th school year – these were pupils who had gone through compulsory education without repetition. In 2022, the proportion of pupils in the 11th school year was 52%, with more repeaters among them than in 2015. At the same time, the subgroup of 15-year-olds who had already attended upper-secondary education was much larger and more diverse in 2022 (5%). In 2015, on the other hand, this subgroup was very small and consisted almost exclusively of particularly high-performing young people who had usually skipped one or two school years (0.5%). The changed composition is also reflected in the reduced difference in performance (→ Figure 88).

Post-COVID-19 and developments in school performance

The short-term and long-term impacts of school closures on school performance during the pandemic in 2020 varies widely by country and analysis. International studies identify learning losses for several countries (*Bett-häuser et al., 2022*), while at the same time emphasising the inconsistent findings. This is due not least to the fact that the duration of school closures varied very widely from country to country and that schools were closed for long periods, especially in those countries where pupils were already performing poorly before the pandemic (*Donnelly & Patrinos, 2021*). Not

enough data exists to be able to reliably investigate this question for Switzerland. Although various literacy surveys have now been conducted regularly again in the cantons, modifications to the measuring instruments make it difficult to compare reliably with the results before the pandemic (*Brauchle et al., 2024*). Only isolated cantonal evaluations are available, but they do not provide any indication of the possible short-term impact of school closures on school performance (*Compagnoni et al. 2025; Petruc-ci, Denecker et al., 2022*). The evaluations from 2023 led to the same result for the French-speaking part of Canton Fribourg. While the comparison of results between 2019 and 2021 initially indicated a deterioration, the inclusion of the results from 2018 showed that the decline compared to 2019 does not demonstrate an explicit negative effect of the pandemic on pupil performance (*SCCRE, 2023*). Taking into account the results of other cohorts, a general trend towards a deterioration in average performance has been observed since 2021, but no direct conclusions can be drawn about the effects of school closures from this (→ Figure 89). Overall, it must be assumed that cohort-specific effects, measurement errors or a general decline in performance (*OECD, 2023a*) lead to much greater changes over the years than the deviations observed in the year of school closures. The possibilities that would allow statements to be made for Switzerland are limited – however, no studies exist either that could prove the long-term negative impact of the pandemic on the school system.

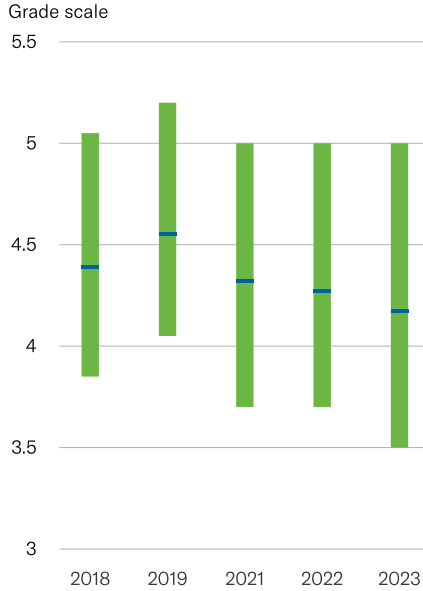
Digitalisation

In order to meet the challenges of digitalisation, the Confederation and cantons have formulated corresponding education goals (*EAER & EDK, 2023*). Teachers should be able to use suitable digital learning media systematically, while pupils should learn how to use digital technologies competently (*EDK, 2019b*). Although the availability of digital tools is insufficient, it is an essential prerequisite for achieving these objectives. Since 2020, it has been possible to describe nationwide and cross-level trends in the use and dissemination of digital aids (*Oggenfuss & Wolter, 2021a, 2021b, 2023, 2024*). After four surveys conducted between 2020 and 2024, the initial push towards digitalisation has largely stabilised (→ *chapter Compulsory education, page 33*). However, the linguistic regional differences remain. In French-speaking Switzerland and Canton Ticino, around half of the pupils use computers hardly or not at all in their classroom, while in German-speaking Switzerland it is only around 20% (→ Figure 90). As a result, the requirements for imparting application skills are not met to the same extent in all language regions. No information can be provided on the type and duration of the use of digital aids on the basis of the monitoring data. Daily use may be short exercise sequences or longer use of the equipment in individual lessons. As digital aids are mainly used in language subjects and mathematics, use of these aids is excluded throughout the entire school day (→ *chapter Primary school level, page 59*). A clear difference can be observed when the use of digital devices at school with that at home is compared. Above all, significantly more pupils report using smartphones at home. This difference is particularly pronounced for younger children (→ *chapter Compulsory education, page 33*). This contrasts with the public debate about the intensive and potentially problematic use of digital

89 Mathematics results before and after the COVID-19 pandemic

Learning status surveys of the French-speaking part of Canton Fribourg, 11th school year; grade scale from 1 to 6; mean highlighted in blue, quartile distance shown in green; no survey in 2020, adjustments were made to the measuring instrument from 2024.

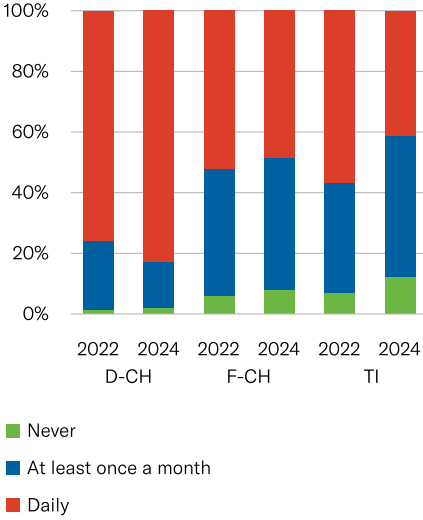
Data: SENOF; calculations: SCCRE



90 Regular use of computers at school

Only lower-secondary level; 2022 and 2024 surveys; computer includes desktop computers, laptops and tablets; checked for individual characteristics

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



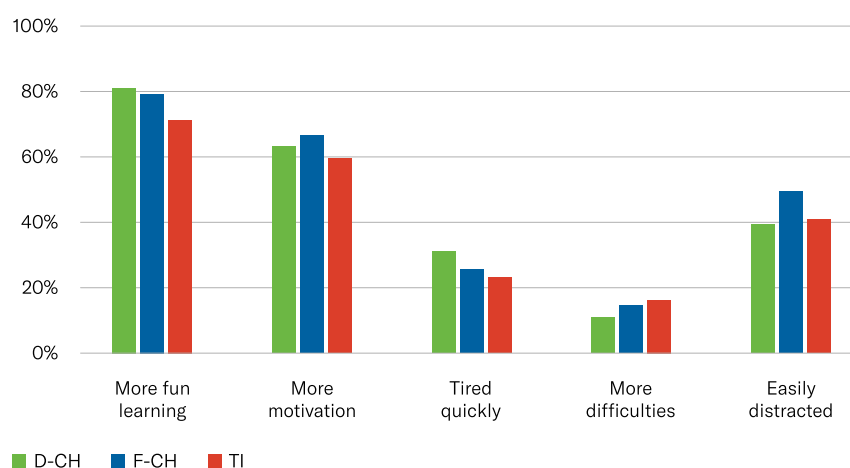
90% of schools attended by 15-year-olds in Switzerland have rules on the **use of mobile phones** in everyday school life and on school grounds. In around half of these schools, the use of this equipment on the school grounds is not permitted (PISA study 2022).

aids in everyday school life (→ *margin text*). Overall, it can be assumed that the use of digital aids at school does not depend solely on whether or not they meet with a high level of acceptance among pupils (→ Figure 91). The positive correlation between the intensity of use and the positive attitude towards using digital aids therefore suggests that greater use is conducive to the productive use of these aids.

91 Attitude towards learning with digital aids

Pupils in lower-secondary education; average values for the 2022 and 2024 surveys. The statements relate to learning with digital aids compared to learning with conventional aids; approval rate after checking individual characteristics

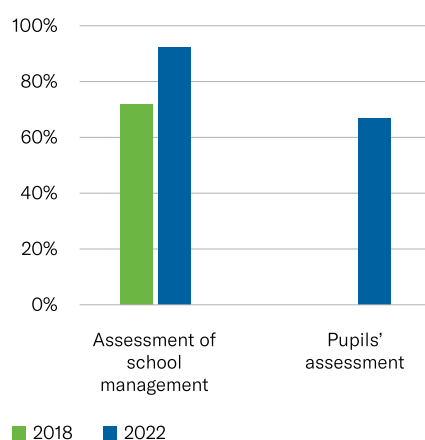
Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



92 Assessment of teachers' digital skills

Agreement rate on whether teachers have the necessary skills in using digital aids; school management: PISA 2018 and 2022; pupils' assessment: only available for 2022

Data: OECD (PISA); calculations: SCCRE



There is insufficient data to determine whether teachers have the necessary skills to use digital aids in class in a targeted and effective manner. Based on the PISA study, it can at least be stated that school directors assessed the digital skills of teachers much more positively in 2022 than in 2018. The COVID-19 pandemic may have encouraged teachers to acquire missing skills, which has meant that, from the point of view of school management, they have become more competent. Results of a representative survey of school management on pandemic-related challenges at schools also confirm the implementation of training measures on the use of digital media in schools (Suter, Bernath et al., 2023). Pupils assess the skills of teachers more critically (→ Figure 92). The manner in which digital aids are used in particular is decisive for their effective use. To date, there is a lack of comprehensive studies on the quality of use showing whether digital tools – and which tools – can be used to achieve better learning results (Educa, 2021).

Since generative language models became readily available, this new possibility of optimising or replacing cognitive activities with AI has also found its way into everyday school life. This makes it a new challenge for schools to motivate children and young people to learn skills that a computer can perform much more quickly. According to the results of digitalisation monitoring – the first and currently only representative data on the prevalence of such applications amongst 8- to 18-year-olds in Switzerland – around 90% of lower-secondary school pupils have already used AI-supported applications either at home for school tasks or in class. Half

of the young people in lower-secondary education stated that they regularly use translation aids in class. At the same time, around one-fifth of young people did not use these or similar applications in class (→ Figure 93). This group may not yet have had the opportunity to learn how to use AI in a meaningful and reflective manner – bearing in mind the fact that the usage rate at school is almost equivalent to that of use at home. Looking at usage by education level, there is a clear difference. While AI applications are much less common at primary school level (→ *chapter Compulsory education, page 33*), the usage rate at upper-secondary level is even higher overall (→ *chapter Upper-secondary education, page 111*; → *chapter Baccalaureate school, page 151*).

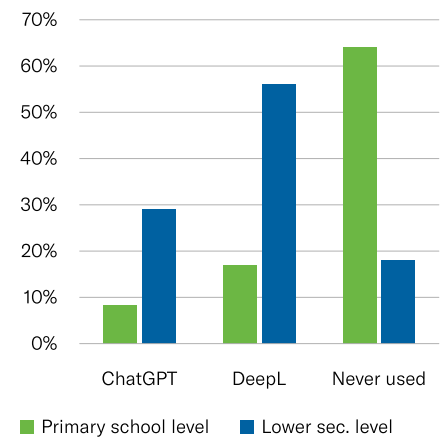
Non-cognitive skills and educational success

Not only cognitive but also non-cognitive skills are decisive for educational success and further education after compulsory education (Heckman *et al.*, 2006). These include a large number of personality traits that can often only be recorded as an approximation, but whose influence on educational attainment is well documented (→ *chapter Upper-secondary education, page 111*). In this context, several cantons have developed funding instruments and assessment grids for general skills (Karlen *et al.* 2022; Schneider, 2024). Various concepts are used in the research literature, including grit, which describes the ability to develop and persistently pursue long-term goals (Duckworth *et al.*, 2007). Equally important is time preference – the ability to defer short-term incentives in favour of long-term returns. Varying time preferences thus explain regional differences in performance within a country (Hanushek *et al.*, 2023). Various studies also show that conscientiousness – which can be roughly measured by punctuality or absenteeism – has a high predictive value for educational success (Almlund *et al.*, 2011; Cattani *et al.*, 2023; Liu *et al.*, 2021; Sälzer *et al.*, 2024). No comparable figures on absences are available for Switzerland, as these are not systematically recorded at cantonal level. The only national data comes from the PISA study, which shows a negative correlation between absences from classes and test results. However, this cannot be interpreted causally. Absences can lead to poorer academic performance. At the same time, however, it is also possible for under-performing young people to be absent from school more often. Between 2015 and 2022, the proportion of 15-year-olds in Switzerland who reported absences remained stable. The deviation in 2018 cannot be interpreted due to the significantly higher proportion of missing data (→ Figure 94). Considering different subgroups, foreign language speakers, boys, young people with parents who have tertiary education and pupils from Italian-speaking Switzerland tend to be missing more frequently (→ Figure 95).

93 Regular use of AI applications in the classroom

Proportion of pupils at primary and lower-secondary level who stated that they had used the aforementioned or similar applications at least once a week in class; 2024 survey; checked for individual characteristics

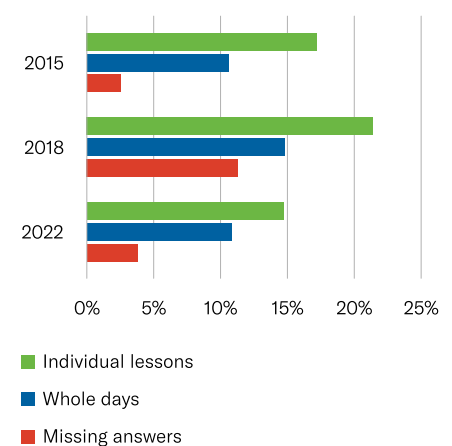
Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



94 Absenteeism, 2015–2022

Proportion of 15-year-olds in lower-secondary education who were missing at least on one or on several days or for individual lessons without an excuse during the specified period; PISA 2015–2022

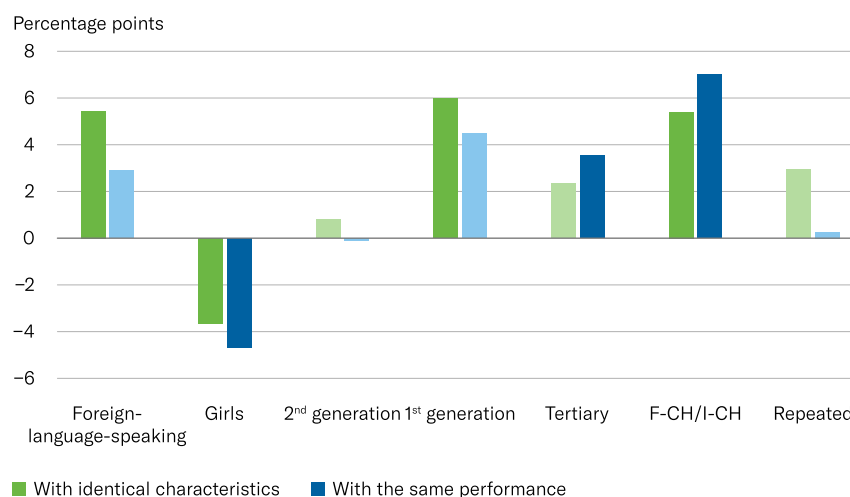
Data: OECD (PISA); calculations: SCCRE



95 Likelihood of absenteeism from classes, 2022

15-year-olds at lower-secondary level in Switzerland; details of the unexcused absence from individual lessons or entire days; with identical characteristics without performance check (green) and with performance check (blue); differences shown: foreign-language-speaking vs. non-foreign-language-speaking pupils, girls vs. boys, pupils without a migration background vs. 2nd or 1st generation, etc.; coloured dark: significant differences; missing answers: 3%

Data: OECD (PISA); calculations: SCCRE



Bullying at schools

Bullying is defined as repeated and systematic aggression against a person and harm to a person (OECD, 2023b). With the use of social media, these attacks are increasingly shifting to the virtual realm in the form of cyber-bullying (→ *chapter General context of the Swiss education system, page 15*).

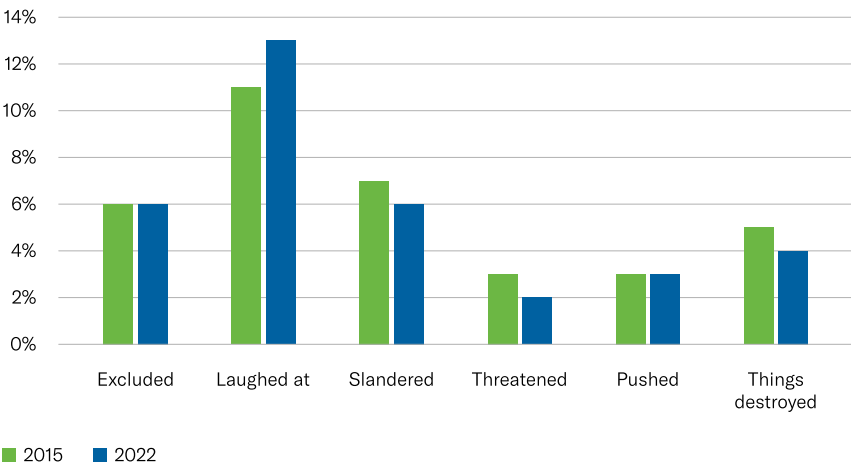
Preventing problematic interactions among pupils, such as bullying at school, is an important part of the educational mandate, both in terms of the negative effects on school performance and in terms of the impact on the mental health of children and young people. Nationwide data on bullying among children and adolescents is collected primarily as part of two international studies: Every four years, the HBSC study covers bullying in 11 to 15-year-olds from both the victim's and the perpetrator's perspective (Delgrande Jordan et al., 2023) (→ *chapter General context of the Swiss education system, page 15*). The PISA study also collects the experiences of bullying amongst 15-year-olds affected. Apart from these international surveys, there is no nationwide and more regular recording of bullying incidents in Switzerland that would enable early detection or a data-based risk analysis. In 2022, 6% of 11- to 15-year-olds said they had previously bullied others, while 11% had been victims of bullying themselves (Delgrande Jordan et al., 2023). According to the PISA study, between 2% and 13% of 15-year-olds report being bullied several times a month or more frequently, depending on the type of bullying (→ Figure 96). Boys, under-performing pupils, young people from Italian-speaking Switzerland and those with a migration background (second generation) are affected more frequently than others. However, it remains unclear whether the proportion of those affected is underestimated or overestimated. The fact that the data collected can be distorted in one direction or the other is only apparent from the many missing answers in the surveys. The values could be overestimated if above all young people who are not affected evade the topic and therefore do not respond. Conversely, inhibitions regarding disclosure of one's own experiences of bullying could lead to a lack of information and thus to an underestimation of the phenomenon. In

the PISA surveys, boys, under-performing pupils and young people from German-speaking Switzerland tend to respond less frequently to questions about experiences of bullying.

96 The 15-year-olds' experiences of bullying, 2015 and 2022

Proportion of 15-year-olds who reported experiencing this form of bullying several times a month or more frequently in the past year; due to the higher proportion of non-responses without PISA 2018

Data: OECD (PISA); calculations: SCCRE



Both young people who bully others as well as those who are victims themselves show poorer performance at school than young people without experiences of bullying, although the causal relationship is not clarified. In addition to absolute performance, the relative position in the classroom or school can also have an impact on whether someone is bullying or being bullied (Comi *et al.*, 2021). Although lower-performing young people are more affected overall, high-performing young people may experience more subtle forms of bullying (→ Figure 97). In addition, girls and boys are affected by different forms of bullying in different ways. Girls are more likely to experience verbal and social forms such as rumours and social exclusion, while boys are more likely to experience physical aggression.

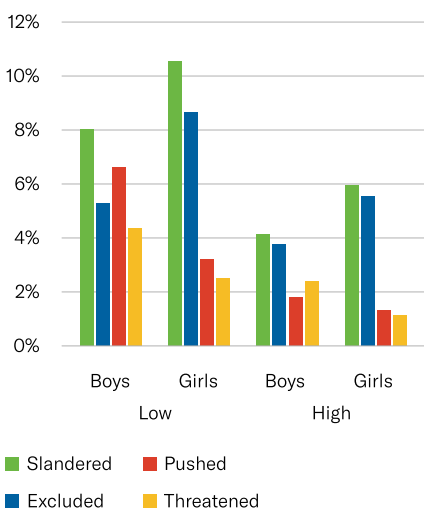
Political education

Like education for sustainable development (→ *chapter Compulsory education, page 33*), political education is one of the areas in which the Confederation and cantons coordinate their activities (EAER & EDK, 2023). The corresponding educational objectives are anchored in the school curricula for the linguistic regions and are therefore binding throughout Switzerland. Whereas the PER explicitly mentions political education, it is incorporated into Lehrplan 21 either as a cross-disciplinary principle or as a component of the field of study “Nature, People and Society” (Hedinger, 2024). Only a few cantons explicitly allocate lessons to political education or political studies (EDK-IDES, 2024f), including Aargau, Geneva, Fribourg, Neuchâtel and Ticino, which also list the subject separately in their cantonal Training Plans. In addition to school, various different actors are active in formal

97 Bullying experience after relative performance and gender, 2022

15-year-olds; 2022 PISA study; reported form of bullying several times a month or more frequently in the past year; high or low: Pupils in the best or worst third of their school (reading performance)

Data: OECD (PISA); calculations: SCCRE



Education and skills not only influence individual aspects of life, they are also relevant for various aspects of social coexistence. For example, in connection with **political participation** (→ *chapter Cumulative effects*, page 347). According to a recent survey, 60% of 16- to 25-year-olds feel competent to understand political matters and have the courage to participate actively in political discussions (Heimann et al., 2023).

and non-formal extracurricular political education (SERI, 2021; Zamora et al., 2020; Hubacher et al., 2025).

In the past 25 years, Switzerland has twice taken part in international studies on the skills of 14-year-old pupils in the field of political education (Biedermann et al., 2010; Torney-Purta et al., 2001). Since then, there has been a lack of up-to-date quantitative data that would allow an assessment of skills in this area. The findings on the subject-specific and didactic skills of teachers (Thyroff et al., 2020), the inventory of the Federal Commission for Children and Youth Affairs (Nef et al., 2022) and the demands of the Swiss Teachers' Association on the topic of (LCH, 2024) also indicate that this topic is not firmly anchored in education at institutions.

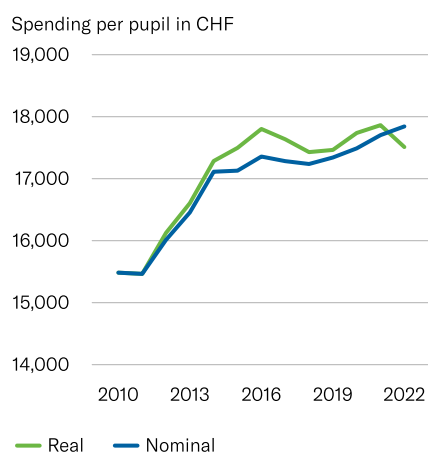
Efficiency/costs

In order to adequately assess the efficiency of lower-secondary education, comparable data on real and monetary inputs and output measures would be required. Although relatively good data is available on monetary and non-monetary inputs, only a few educational objectives are regularly and quantitatively reviewed, which severely limits the assessment of efficiency or sometimes even makes it impossible. In addition, data is not available at all levels of aggregation. While it is still possible in some cases to make statements about differences in efficiency between cantons, this is virtually impossible at the level of individual schools. Efficiency analyses are also made difficult by the lack of information on the various preliminary achievements (at primary school level), which would lead to an incorrect assessment of the efficiency of lower-secondary education. As it is virtually impossible to make statements on efficiency for lower-secondary education as well as for the entire Swiss education system, the differences between the real inputs (class sizes, student-teacher ratios) and the monetary costs will be highlighted in particular.

98 Development of education expenditure for lower-secondary education

Excluding special schools and music schools; nominal and real (deflation-adjusted, CPI 2010); only staff salaries (teachers' salaries and salaries of other staff)

Data: FSO; calculations: SCCRE



Expenditure on lower-secondary education

Like the statistics for compulsory education as a whole, the Federal Statistical Office's data on public education expenditure at the lower secondary level are based on calculations that take account of spending at both the municipal and cantonal levels. Such figures are often subject to a mandatory or at least optional referendum, which results in the publication of aggregated data for individual levels of education with a significant delay. The figures currently available refer to 2022 and cannot be shown for the individual levels by canton (→ *chapter Primary school level*, page 59). In order to achieve the best possible comparability between the cantons, certain restrictions are applied, such as limiting costs to the category of staff salaries. Educational expenditure for this category amounted to around CHF 17,800 per pupil in 2022 (→ Figure 98). This is an increase of 12% compared to 2010. One reason for the sharp increase is the fact that education finances did not respond adequately to developments in pupil numbers, which had fallen by around 10% in the same period.

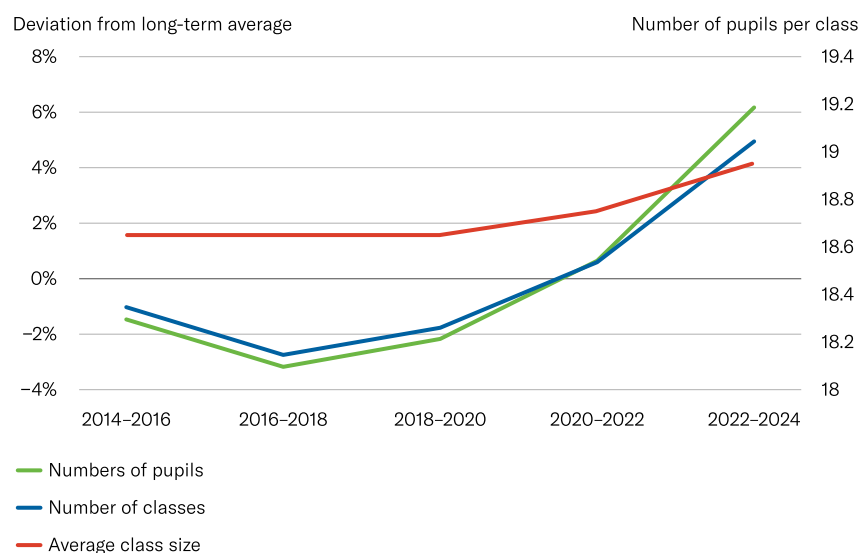
Class size development

The development of pupil numbers at lower-secondary level since 2014 was initially subject to slight fluctuations. From 2018, pupil numbers increased, while the average class size in this first phase remained constant at 18.6 (→ Figure 99). The fact that the average class size developed independently of pupil numbers shows that it did not cushion the fluctuations as expected. Instead of expanding the existing classes, new classes were created (→ *chapter Primary school level, page 59*). The fact that the classes did not increase in size was also a consequence of political decisions. Not least, it was hoped that smaller classes could have a positive impact on school performance (OECD, 2012). Such effects, however, are not generally backed up by the data. If they do occur, they usually only affect certain groups of pupils under specific conditions (Bach & Sievert, 2025; Filges et al., 2018). From 2020, the sustained growth in the pupil population was no longer only offset by the creation of additional classes, but increasingly also by the expansion of existing classes. This is reflected both in the average class size, which has grown steadily, as well as in the number of large and small classes: In school year 2023/24, the number of classes with more than 24 pupils was 13% above the long-term average, while the number of smaller classes (less than 17 pupils) was 3% below the average.

99 Development of pupil numbers and class size

Only mainstream classes in public schools; deviation from the long-term average (2014/15–2023/24) and the average class size, shown as a two-year average.

Data: FSO; calculations: SCCRE



Cantonal comparison of student-teacher ratio

It is not only class sizes that are decisive for education costs, but above all the student-teacher ratio, in other words, the number of pupils per teacher measured in full-time equivalents (FTE). Large classes do not necessarily mean a poor student-teacher ratio, for example, if several teachers work in a class at the same time for group work. Class size is therefore an

insufficient measure for estimating costs. The average class size at lower-secondary level was 18.9 pupils in the school year 2023/24. The average student-teacher ratio for the whole of Switzerland was 11.7 pupils per full-time equivalent of one teacher. The development of average class size and the mean pupil-teacher ratio in the cantons between 2014 and 2023 shows no clear pattern (→ Figure 100). An increase in both class size as well as student-teacher ratio could be interpreted as a deterioration in the framework conditions (Aargau, Schaffhausen). A reduction in the average class size combined with a lower student-teacher ratio (Grisons, Ticino) could accordingly mean an improvement. A certain balance was achieved in other cantons (Basel Landschaft, Fribourg).

100 Student-teacher ratio and class size by canton

Development between 2014 and 2023; mainstream classes in public school; student-teacher ratio: number of pupils per teacher in FTE; data for Canton Solothurn missing

Data: FSO; calculations: SCCRE

Change in class size 2014–2023 in percentage points



It is not possible to conclusively assess whether cantons with small classes and a poorer student-teacher ratio or those with large classes and a better student-teacher ratio are more cost-effective. In addition, research into the impact on performance takes class size, but not the student-teacher ratio, into account almost without exception. Studies on the effectiveness of the latter are also lacking, although differences are conceivable depending on how the relationship between teachers and pupils is structured. As a result, only the costs can be estimated, depending on the student-teacher ratio. A statement on efficiency is not possible without data on effectiveness. A direct correlation between the student-teacher ratio and school performance could not be established for Switzerland (SCCRE, 2023). This does not rule out the possibility that there is an impact, but it also means that individual cantons are significantly more efficient than others in terms of student-teacher ratio.

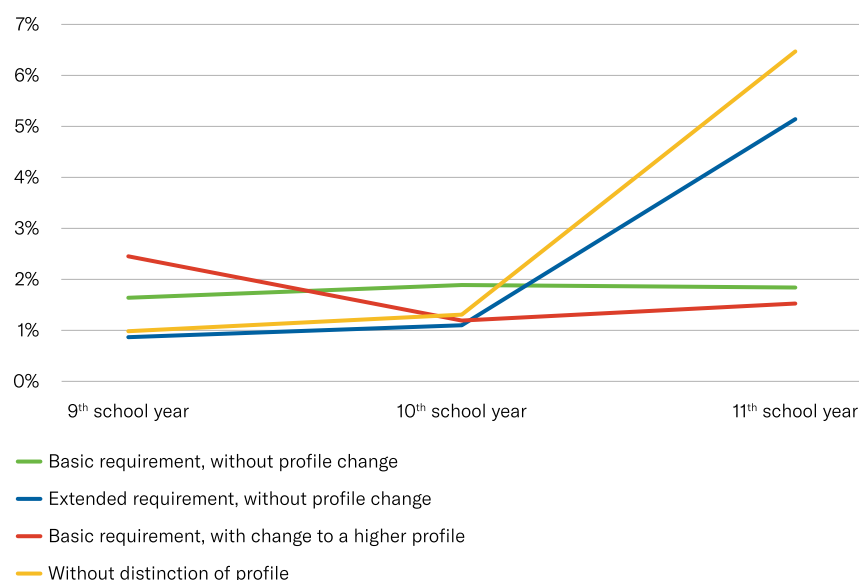
Education paths and repetitions at lower-secondary level

According to the FSO, around 92% of pupils complete lower-secondary education in the three regular years (three-year average 2019–2021). The remaining 8% repeat at least one school year. Of the pupils who attend a class with basic requirements at the start of lower-secondary education, a total of 10% repeat. Two-thirds of these pupils subsequently complete lower-secondary education with a higher requirement level. A repetition has been worthwhile in an individual case if completing the higher requirement level results in more benefits than the costs of an additional year of education – both for the person concerned and for society. Boys, young people with a migration background and young people from educationally disadvantaged parents repeat classes more frequently than other young people. While the repetition rate in the first two years of lower-secondary education (9th and 10th school year) is lower in classes with advanced requirements or in classes with no differences in level than in classes with basic requirements, repetitions in the last school year (11th school year) occur much more frequently in classes with advanced requirements (→ Figure 101). Among other things, the increase in repetitions is due to the fact that in seventeen cantons, the transition to a baccalaureate school can take place after the 10th school year. If the change takes place after the 11th school year, the last school year of compulsory education is completed at secondary school and then at baccalaureate school – which is recorded in the statistics as a repetition (FSO, 2021b).

101 Repetitions by school year and requirement level

Repetition rates by school year and requirement level; three-year average 2019–2021

Data: FSO



Different cantonal requirements apply for repetitions not related to the switch to baccalaureate school (→ Figure 102). In more than half of the cantons, a repetition at lower-secondary education is generally possible (→ Figure 103). Cantonal repetition rates vary widely, but the differences are only partly due to the different requirements. In view of the high cost

102 Regulations governing repetitions at lower-secondary level

Rules apply with some exceptions (see note) for the 9th–11th school year; as of 2024

Data: EDK-IDES

Rules	Cantons
Usually not possible, only in special circumstances	AG, AR, BS, FR, NW, ZG, ZH
Basically possible	AI, BE-d, BE-f, BL, GE, GL, GR, JU, LU, NE, OW, SG, SH, SO, SZ, TG, TI, VD, VS, UR

AG: in the 9th and 10th secondary school year possible

AI, BL: in the 11th school year no repetition possible

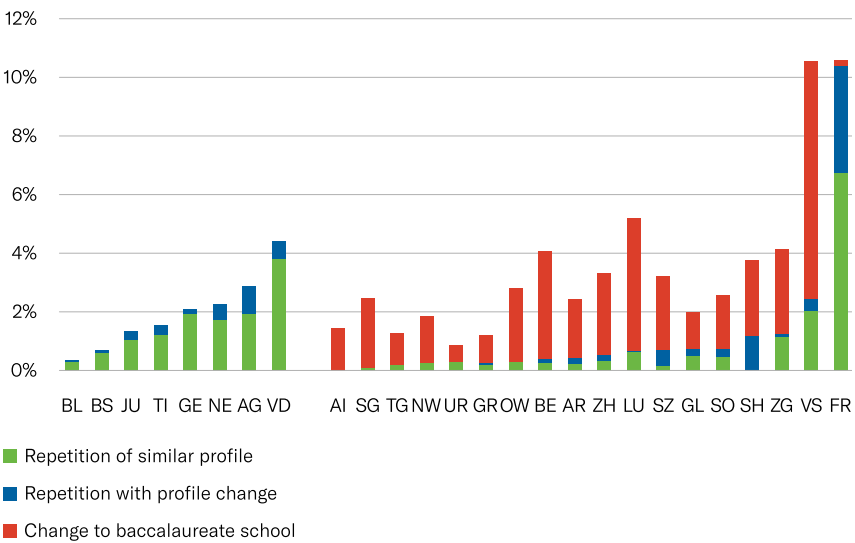
SO, SZ: in the 11th school year only possible in exceptional cases

implications of repetitions – which result in more than CHF 300 million in additional expenditure per year – it would be advisable to do better research into the effectiveness of repetitions. On the one hand, the question arises as to whether the learning achievements justify private and public investment. On the other hand, it would be necessary to examine whether these funds could not be invested more effectively in other measures that would enable a similar result without repetition.

103 Repetitions of the 11th school year and switch to baccalaureate school

Persons who completed the 11th school year in 2020/21 and repeated this school year in 2021/22 or persons who switched to baccalaureate school after the 11th school year instead of after the 10th school year were taken into consideration.

Data: FSO (LABB); calculations: SCCRE



Equity

Equity is about whether pupils are given the same opportunity to realise their full individual educational potential, regardless of their gender, social background and other characteristics. This question can usually not be answered adequately, as the individual’s educational potential is generally unknown. However, when comparing groups rather than individuals, it can be assumed that there are no group-specific differences with regard to performance potential (for example, between girls and boys), then group-specific differences in performance must be interpreted as an indication of a potential equity problem.

PISA performance of young people with a migration background

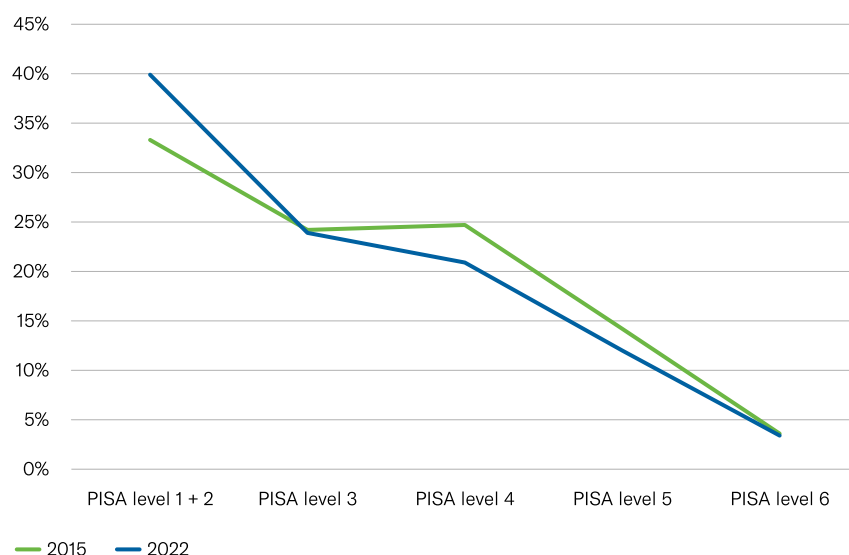
The composition of the PISA sample changed between 2015 and 2022 such that better PISA results would actually have been expected due to the higher proportion of 15-year-old pupils with at least one parent who had

a tertiary education. However, the proportion of foreign-language-speaking pupils also increased from 46% to 51% during this period. This had an attenuating effect on performance, as these pupils perform more poorly on average in PISA. An in-depth analysis now shows that it is not just the group of foreign-language-speaking young people that has increased. Over time, the risk of foreign-language-speaking pupils only reaching competence level 1 or 2 also increased. Whereas in 2015, 45% of foreign language speakers only achieved the lowest proficiency levels, this figure was 52% in 2022. The combination of a higher proportion of foreign-language-speaking pupils and the fact that they have a greater risk of being among the weakest performers resulted in the proportion of foreign-language-speaking pupils with performance at the lower end of the spectrum rising from 21% to 27% between 2015 and 2022. More foreign-language-speaking pupils who, at the same time achieved even worse test results, only partially explain Switzerland's overall observable deterioration in PISA results (→ Figure 104).

104 PISA competence levels achieved in mathematics

15-year-olds in the 2015 and 2022 PISA studies by competence level achieved in mathematics

Data: OECD (PISA)



Socioeconomic background and performance

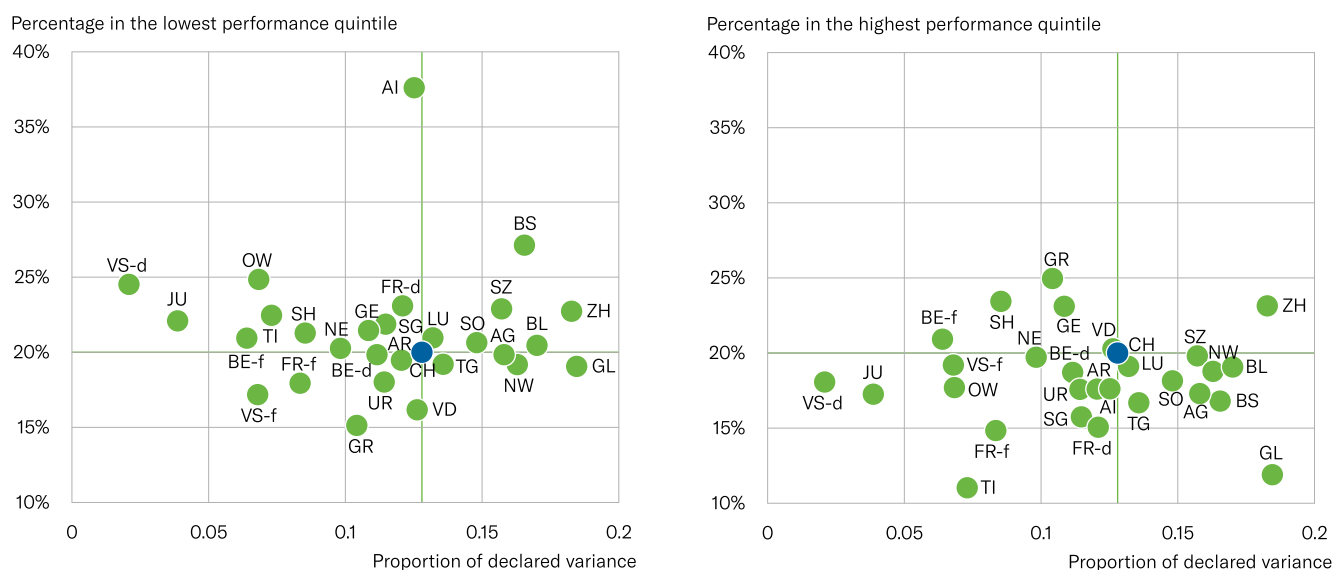
The influence of socioeconomic background on school performance is one of the best-documented correlations between belonging to a particular group and school performance in the research literature (*Coleman, 1966; Denecker et al., 2024; Erzinger et al. 2023; OECD, 2001, 2010; Ramseier et al., 2002*). At the same time, the research literature has also shown that differences in performance between groups with different socio-economic backgrounds may not be automatically attributed to educational inequities at school, as family, extracurricular support also varies (*Heckman, 2006*). As already shown in the 2014 Education Report with the PISA results from 2009 (*SCCRE, 2014*), the cantons differ not just in terms of the average school performance of their pupils but also with regard to the influence

that socioeconomic background has on individual performance. It was only possible to show these differences for a few cantons in the PISA study. With the results of the basic competencies review from 2016 (mathematics, 11th school year) and 2017 (school language, 8th school year) they could be documented for all cantons (SCCRE, 2023); now they can also be compared with the results of the 11th school year for the school language from 2023. It has been repeatedly observed that pupils from cantons with a high performance variance, which can be explained by socioeconomic background, do not necessarily perform better on average. This applies both for the proportion of pupils who achieve very low grades (→ Figure 105, left), as well as those with the highest grades (→ Figure 105, right). The situation is particularly problematic in cantons where the influence of social origin on individual performance is above average and the average cantonal performance is below average. The link between socioeconomic background and school performance in the French-speaking cantons and Ticino tends to be weaker than in German-speaking Switzerland.

105 Influence of social origin on performance, by canton

Results of the ÜGK 2023; 11th school year, school language: Reading comprehension. Left: Share of pupils performing in the lowest quintile (Q₁). Right: Share of pupils with attainment in the top quintile (Q₅), taking into account gender, migration background, first language, social origin and age. Share of declared variance: Share of performance variance explained by social origin

Data: EDK (ÜGK); calculations: SCCRE



Level of requirements and education of parents

As already previously observed, children from socially privileged families have a higher probability of attending a class with more advanced requirements at the end of primary school level than children from less privileged families (Coradi Vellacott et al. 2003; Ramseier & Brühwiler, 2003; SCCRE, 2023). Social selectivity is even more pronounced upon admission to baccalaureate school (Buchmann et al., 2016; Burger, 2023; Moser et al. 2011; SCCRE, 2023). There is no noticeable change in unequal access during the period 2012–2022 (→ Figure 106). Pupils who have at least one parent

with a tertiary education had a higher probability of attending a class with advanced requirements in both 2012 and 2022 than those whose parents did not have a tertiary qualification. In addition to primary origin effects, which are reflected in different performance levels and partly explain the observable inequalities, secondary origin effects also lead to unequal outcomes with the same performance. Different educational aspirations of parents as well as different performance expectations or assessments by teachers explain why pupils from socially privileged families are more frequently assigned to classes with advanced requirements, even with the same academic performance.

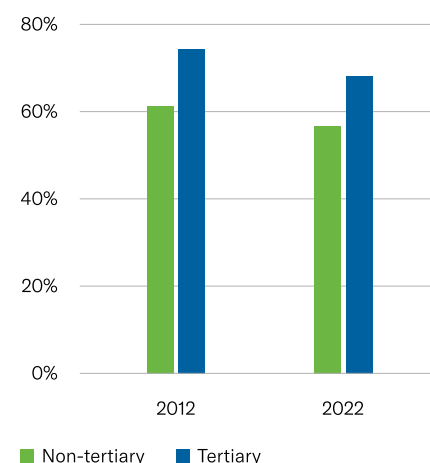
Biases in performance assessment by the teacher

Unequal opportunities for young people with certain characteristics can also be explained by teachers' assessments, in particular with regard to grading (→ *chapter Compulsory education, page 33*). It is precisely because of this key function that fulfils grades or other forms of assessment in the education system that the manner in which teachers make their assessment is of enormous importance – not just for the individual being graded, but also for equal opportunities in the education system in general. Distortions in assessment that systematically disadvantage or favour certain groups of pupils should therefore be avoided wherever possible. However, they can only be identified if the teacher's grading (assessment) can be compared with an external assessment that is as standardised and covers the same range of skills as the teacher's assessment. Extensive international research has shown that not only teachers' performance expectations, but also their assessment of pupil performance are unwittingly influenced by stereotypes (Zanga & De Gioannis, 2023). In mathematics and language subjects, girls, non-foreign-language-speaking pupils and those from socially privileged families tend to be rated better than others for the same standardised, externally audited performance (Lavy & Sand, 2018; Nennstiel & Gilgen, 2024; Olczyk et al., 2023; Sahlström & Silliman, 2024). The findings for gender and language background can also be verified for Switzerland (Angelone, 2022; Zanolli & Petrucci, 2024; Oggenfuss & Wolter, 2025). It is also clear that assessment depends on the average class performance. In classes with a low average performance, the teacher's assessment is significantly higher than in very good classes. Combining different features can result in a difference of more than half a grade for the same objective performance (→ Figure 107). Further research suggests that systematic biases in grading cannot be reduced simply by disclosing external test results (Oggenfuss & Wolter, 2025). In order to sensitise teachers to their individual biases and stereotypes, they would have to be made aware of their biases directly (Alesina et al., 2024; Neuenschwander et al., 2021). Even if there is little research on this, it is not to be expected that the distortions empirically identified in grading would disappear by abolishing grades. On the contrary, it can be assumed that such distortions would also be reflected in other forms of assessment.

106 Likelihood of attending a class with advanced requirements

PISA studies 2012 and 2022; at least one parent with tertiary education; controlled: with the same performance and comparable individual characteristics

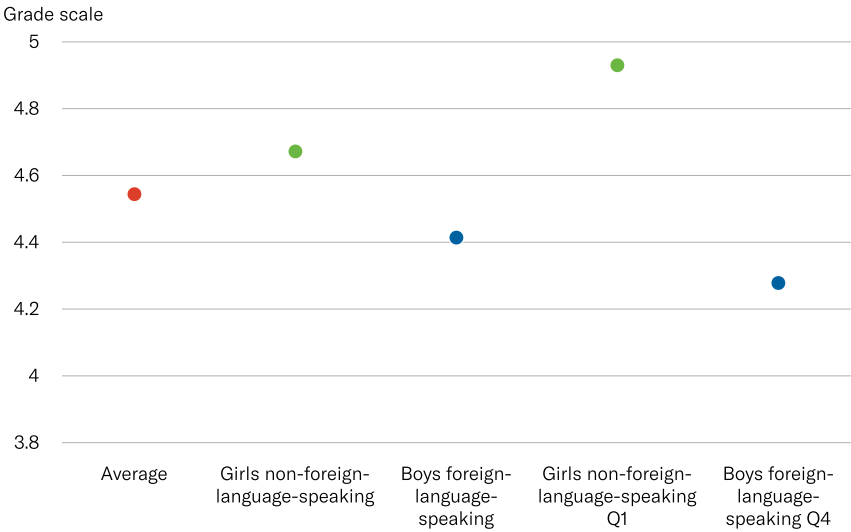
Data: OECD (PISA); calculations: SCCRE



107 Distortion in the assessment by the teacher

Grades in German for the same, externally tested, standardised performance; Q1: Classes with the lowest standardised average performances (lower quartile), Q4: Classes with the highest standardised average performances (upper quartile)

Data: Oggenfuss & Wolter (2025)



Reading example

Non-foreign-language-speaking girls in classes with a low average class performance score 4.9 on average. Foreign-language-speaking boys with comparable, externally tested, standardised performance, who are divided into classes with a high average class performance, have an average of 4.3.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

UPPER-SECONDARY EDUCATION

CROSS-CUTTING THEMES

Post-compulsory education means choice of education type

The post-compulsory part of education generally begins with admission to upper-secondary level. The exceptions are the cantons of Geneva and Ticino, where education is compulsory until the age of eighteen. In addition, education at upper-secondary level begins during compulsory schooling in certain cantons. However, not all pupils opt to transition to upper-secondary level immediately after completing their compulsory education (→ *Immediate transitions and interim solutions*, page 113). The transition comes with a choice – vocational education and training (VET) or general education. General education includes baccalaureate schools and upper-secondary specialised schools (FMS). The decision is determined by academic ability, personal preferences, social background and cantonal educational programmes. This chapter addresses the different types of transition to upper-secondary level, the choice of school types available and the success rates applicable to pupils while going through and completing post-compulsory education. The background is provided by the education policy objective of 95% of 25-year-olds to have an upper-secondary level of education.

Finally, this overview chapter outlines digitalisation at upper-secondary level, the importance of non-cognitive abilities and the topic of “exchange and mobility”. More specific issues are addressed in the chapters on vocational education and training, baccalaureate school and upper-secondary specialised school.

Development of pupil numbers

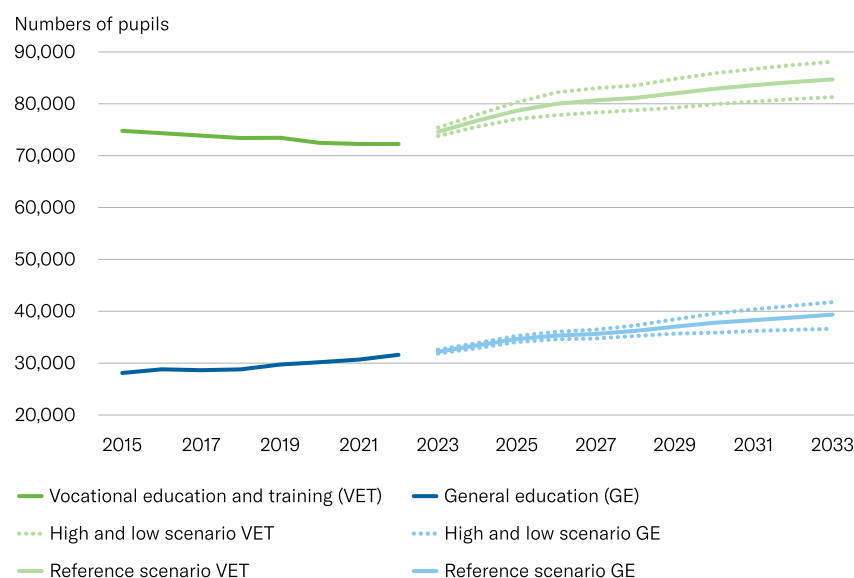
The number of pupils who started upper-secondary education each year has been fairly stable over the past decade. However, pupil growth has been accelerating in the current decade, reflecting the development of birth rates from the first decade of the new millennium onwards. After a prolonged decline, these had risen steadily from 2005 to 2021. With a delay of 16 years on average, the number of pupils at upper-secondary level is therefore also likely to increase until the middle of the 2030s. In the reference scenario of the Federal Statistical Office (FSO), there would be an increase of 16% in the number of pupils to be educated in baccalaureate schools, upper-secondary specialised schools or as part of vocational education and training in the ten years between 2023 and 2033. As always, the scenarios are subject to considerable uncertainty. For example, growth amounts to only 10% in the low scenario and over 21% in the high scenario, making a difference of almost 12,000 pupils in 2033, which amounts to almost 10% of the pupils entering upper-secondary education this year according to the reference scenario.

Most pupils still enter vocational education and training (VET) after completing their compulsory education, but this proportion fell slightly in the observation period 2014–2022. While the proportion of this group of people in relation to all pupils entering a certified upper-secondary education was still almost 73% in 2014, this figure had sunk to below 70% in 2022. For the forecast period 2023–2033, however, the Federal Statistical Office (FSO) expects a weaker momentum towards general education schools; the share of vocational education and training (VET) should still be 68% in the reference scenario in 2033 (→ Figure 108).

108 Development of pupil numbers at upper-secondary level

Effective pupil numbers (1st-year apprentices) 2015–2022 and development scenarios (2023–2033); reference scenario as well as high and low scenarios

Data: FSO



Immediate transitions and interim solutions

Independently of economic fluctuations, there was a long-term growing trend towards interim solutions. In the meantime, however, their number has stabilised and noticeable declines have also been recorded in some cantons. In 2022, the value in most cantons was much closer to the minimum of all values for the years 2014–2022 than to the maximum in this period. In 2017, for example, more than a third of school leavers in the canton of Basel Stadt opted for an interim solution, after which this figure levelled off at around 22%. The differences between the cantons are constantly large, but large fluctuations can also be observed in individual cantons more often than in the past over time (→ Figure 109).

It is not certain whether these trends will continue, as the transition barometer of the State Secretariat for Education, Research and Innovation (SERI) has shown figures rising again since 2022 (Golder *et al.*, 2024; Golder *et al.*, 2025). Looking at the reasons for an interim solution (without bridge-year courses) in this survey, slightly fewer young people than in the past stated that they had not found an apprenticeship. The second most frequently cited reason was needing time off after compulsory education. It was striking, however, that significantly more young people, around a third, were unable or unwilling to give any reason for choosing an interim solution. In 2018, this figure was only 3%. There has also been a sharp increase in the number of young people who were unable or unwilling to state how things should proceed after the interim solution. As stated in the 2023 Education Report, it cannot be stated on average that young people are more successful in upper-secondary education following an interim solution. An exception to this is the lower rate of delayed completions, which means that there are fewer repetitions during training for pupils with an interim solution.

Interim solutions are activities aimed at admission to upper-secondary education. This covers:

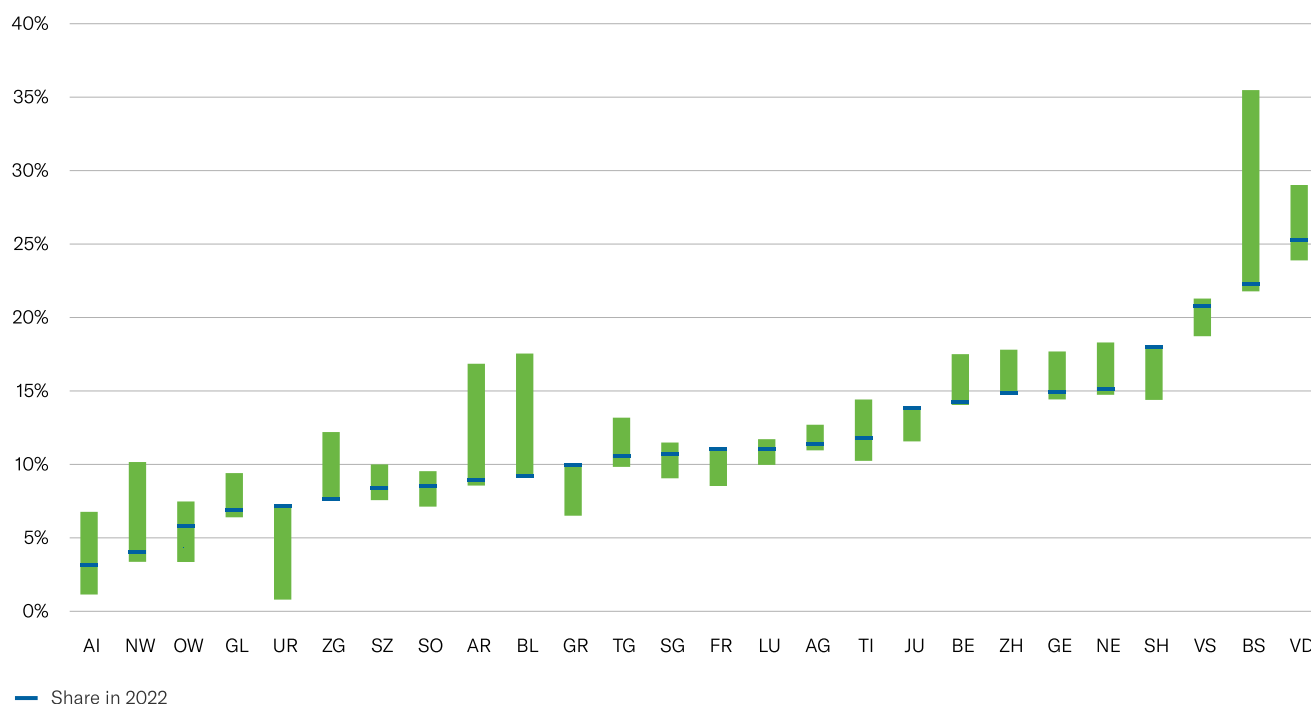
- **Transition courses**, i.e. those interim solutions statistically recorded by the FSO, namely:
 - bridge-year courses financed or subsidised by the cantons that prepare students for transition to upper-secondary education;
 - special educational bridge-year offers, vocational preparation classes in special or remedial schools;
 - school education such as the 12th school year;
- the **motivation semester** (SEMO) financed by unemployment insurance;
- the SERI **preliminary integration courses** (INVOL+);
- privately financed interim solutions including language-learning trips and courses, au-pair assignments and placement years.

Indirect transitions to upper-sec include, in addition to persons in interim solutions, interim years without (formal) education and employment with subsequent admission to upper sec.

109 Frequency of transitional solutions by canton

Relative proportion of the cohort that progresses to upper secondary education: the green bar shows the range between the minimum and maximum shares from 2014–2022.

Data: FSO (LABB); calculations SCCRE



Vocational and general education options

Viewed across Switzerland as a whole, the proportion of admissions to **vocational education and training** declined by about 3.3% before the COVID-19 crisis, in other words, between 2014 and 2019; between 2014 and 2022 this decline was 4.8%.

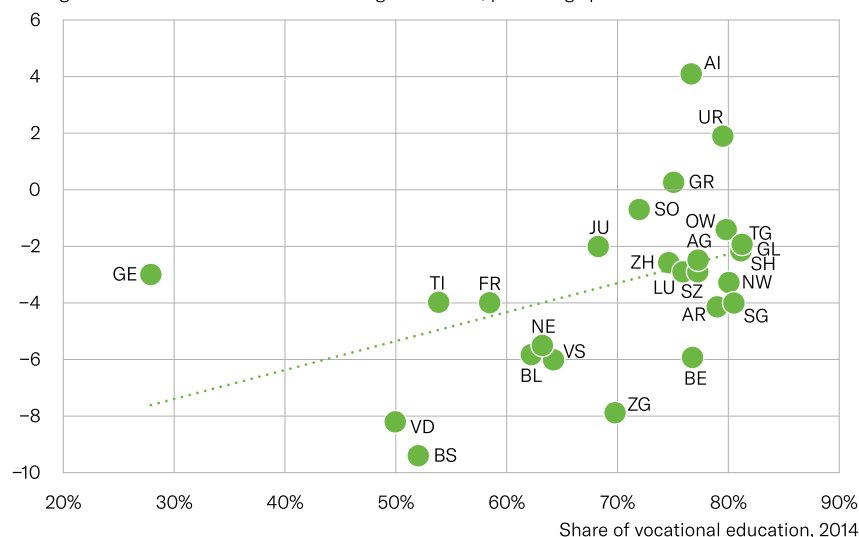
Following compulsory schooling or an interim solution, young people also have to decide which programme to follow, i.e. vocational education and training or general education. Although the majority of admissions continue to take place in vocational education and training (VET), a decline has been observed here for some time. However, since the duration of the observation period was extended since the last Education Report – from 2014–2019 to 2014–2022 (→ Figure 110) – there has been a change: In the shorter period, there was a high correlation between the change and the original value: In other words, the figures dropped more frequently in those cantons in which the figures for vocational education and training had already been lower in 2014. The correlation is now only faintly discernible, as the proportions of vocational education and training are declining in practically all cantons, including those with rates that were originally high. Contrary to the findings in the 2023 Education Report, it is therefore more likely to be a general trend than an increasing heterogeneity of development between the cantons.

110 Cantonal shares of vocational education and training when transitioning to upper-secondary education

Share of young people who began vocational education and training in relation to all young people in a cohort entering upper-secondary level

Data: FSO; calculations: SCCRE

Change in vocational education and training 2014–2022, percentage points



However, the trends in terms of shifts between company-organised and school-based vocational training remain heterogeneous, albeit in a minority of cantons. Occupationally organised apprenticeships continue to be on the rise, particularly in the cantons of Neuchâtel and Basel Stadt. Inversely, a reversed trend is observable in the canton of Fribourg, where the proportion of dual apprenticeships has dropped in less than ten years from over 93% of all vocational education and training (VET) to just over 86% in 2014 (→ Figure 111).

For the apprenticeship market, the combination between the number of young people who are interested in vocational education and training and the proportion of these young people who choose or receive vocational education and training organised by the company is decisive. If we look at this share – in other words, the share of school leavers who start a company-organised vocational education and training at upper-secondary level – we see that the corresponding differences between the cantons are even more pronounced. While 7% of young people in the canton of Geneva chose this path during the period under study, this figure was sometimes over 70% in the cantons of Central and Eastern Switzerland.

Educational choice and cognitive skills

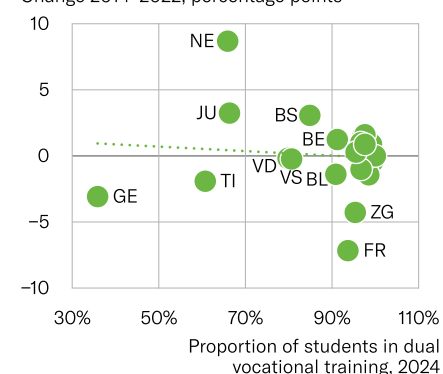
After compulsory schooling, young people choose the type of education depending on their academic performance at the end of compulsory schooling, or, on the basis of this performance, they are admitted to certain types of educational training or apprenticeships following selection examinations and interviews. Compared to pupils at upper-secondary specialised schools and in vocational apprenticeships, those who switch to a baccalaureate

111 Cantonal shares of company-organised vocational education and training

Shares in relation to all students in vocational education and training

Data: FSO (LABB); calculations: SCCRE

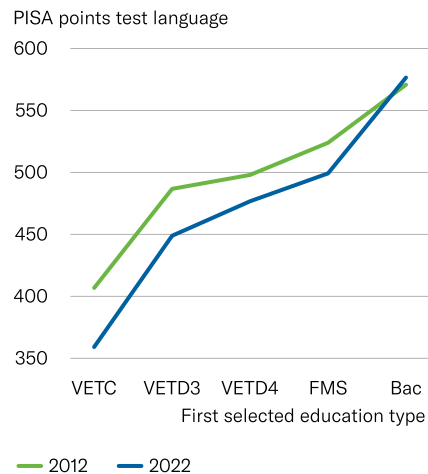
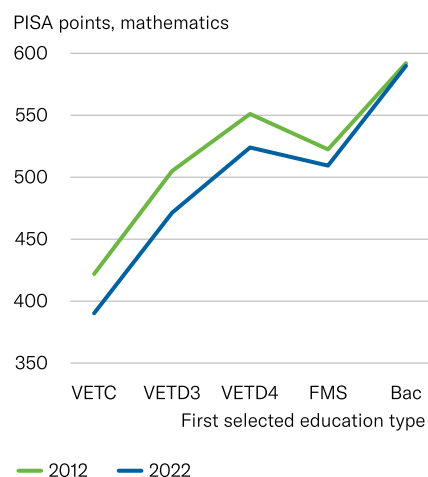
Change 2014–2022, percentage points



112 Average number of PISA points in mathematics and reading by education type and nature

Test cohorts 2012 and 2022

Data: SCCRE (SEATS I and SEATS II);
calculations: SCCRE



VETC	Two-year basic education with Federal VET Certificate
VETD3	Three-year basic training with VET diploma
VETD4	Four-year basic training with VET diploma
FMS	Upper-secondary specialised school
Bac	Baccalaureate school

school have higher academic skills on average. However, this does not mean that all pupils at baccalaureate schools perform better at school than other young people, because, as has already been shown in previous education reports, there are major overlaps in the distribution of performance between the individual education options.

In 2022, the PISA test performance of pupils was linked to the administrative education data of the Federal Statistical Office (FSO) for the second time. This connection makes it possible to analyse educational choice in relation to academic performance. A decline of around 25 points was observed in the average PISA scores in the areas of school language and mathematics in Switzerland between the two survey dates. If we look at the pupils who transferred to upper-secondary level in 2012 and 2022 directly after the 11th school year, it appears that this decline affects all education programmes with the exception of baccalaureate school (→ Figure 112). As equally high-performing pupils transferred to baccalaureate school in 2022 as they did ten years previously, the drop in performance is concentrated on the other education pathways, in particular upper-secondary specialised schools and even more clearly on vocational education and training. Within the latter, the decline is particularly pronounced for three-year apprenticeships and two-year training with a Federal Vocational Certificate. For these two types of education, the average decline in PISA performances in both areas of competence tested was 40 points. According to OECD calculations, this corresponds to a loss of skills roughly equivalent to what pupils learn in a school year.

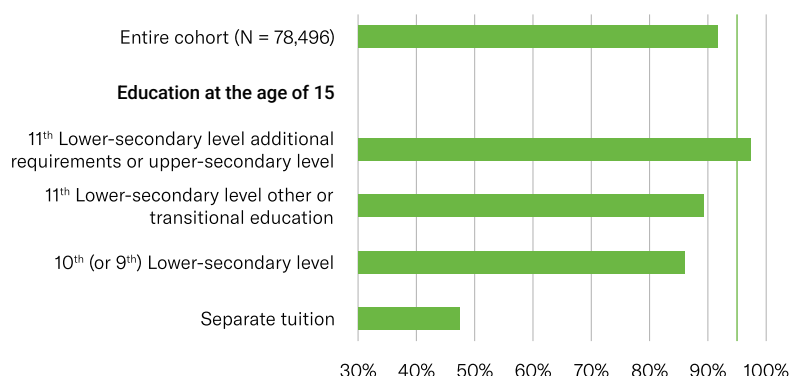
Success at upper-secondary level

In 2006, the Confederation, cantons and social partners agreed on the education policy goal of 95% of 25-year-olds in Switzerland having an upper-secondary level qualification. For the cohort that was 15 years old in 2013 and included in the statistics of learners and students, the completion rate 10 years later was 91.7%. The rate differs between groups of people with different characteristics, especially with regard to the type of education of the pupils at the age of fifteen (→ Figure 113). Only those pupils who, at the end of compulsory education, either attended the most demanding courses of lower-secondary education or who were already in post-compulsory training at the age of 15 exceeded the political 95% target by the age of 25. It is hardly surprising that pupils who were taught separately at the end of compulsory schooling, in other words, were either in a special school or a special needs school class, only had a completion rate of 47.4% at the age of 25. The type of education or year of education at the age of 15 is therefore not only a good indicator of performance at the end of compulsory education, but also a good predictor of whether pupils will also complete post-compulsory education.

113 Completion rate at the age of 25 by type of education in compulsory education

Values for the cohort that turned 15 in 2013; reference line at 95%

Data: FSO



Overall, no progress has been made regarding the achievement of objectives compared with previous education reports. Quite the contrary: Looking at the three-year averages for 2016, 2019 and 2022, it can be seen that the graduation rate fell from 91.5 to 91.1% and in 2022 to 90.1%. The differences by gender are also constant, with women achieving better results. In 2022, they reported a graduation rate of 91.6%; for men, the rate was 88.5%.

Cantons with a high proportion of vocational qualifications among first-time qualifications at upper-secondary level also have higher overall graduation rates among persons aged 25 (→ Figure 114). The bivariate correlation is extremely strong and shows that over 70% of the differences in graduation rates between the cantons can be explained by the different proportions of general education qualifications, the counterpart to vocational education and training, at upper-secondary level. Although no causal link has yet been proven, the 2023 Education Report shows the following: This correlation remains stable even if various characteristics of the composition of the population in the cantons, such as migration status, are taken into account when calculating the graduation rate.

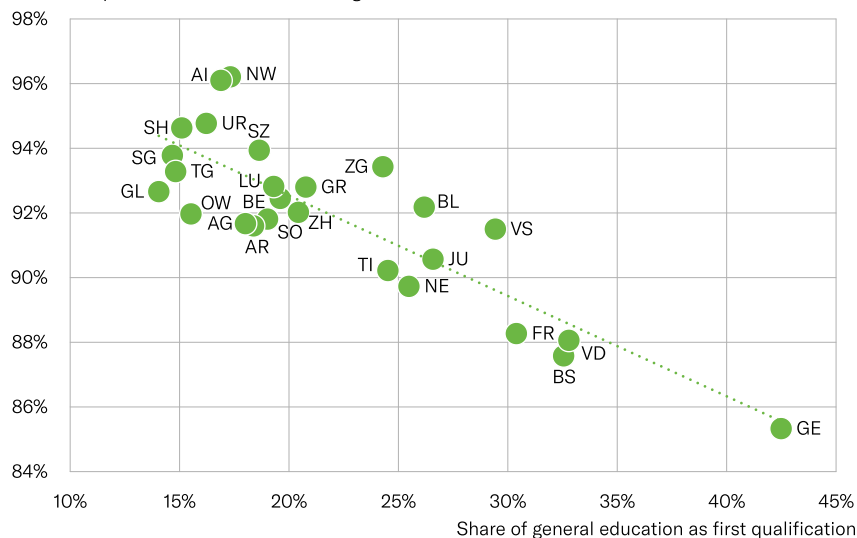
There have always been major differences between pupils with and without a migration background in terms of completion rates at upper-secondary level. In 2022, Swiss pupils achieved an average graduation rate of 92.1% compared to foreign pupils at around 85%, although, unlike in previous periods, there is no longer any difference between the first and the second generation.

114 Cantonal graduation rates at the age of 25 and share of general education

Graduation rate of all young people born in 1997 in 2022

Data: FSO (LABB); calculations: SCCRE

Amended qualification rate for cohorts aged 25



Asylum area

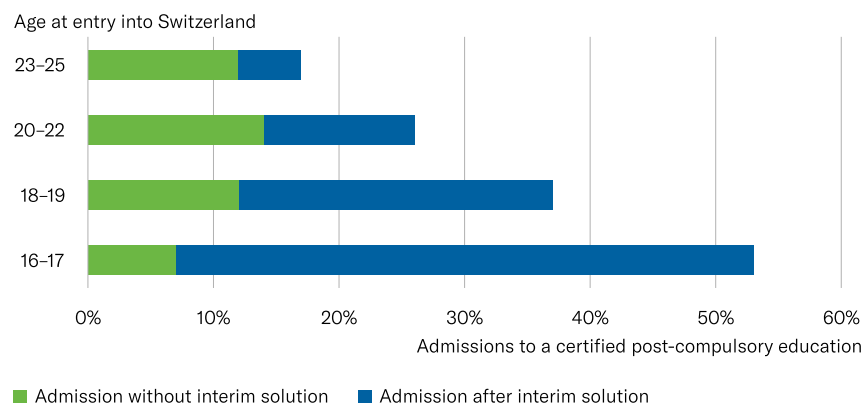
Of the persons **entering Switzerland** with an asylum application in 2012-2017, 38% came from Eritrea, 24% from Afghanistan, 15% from Syria, 10% from other African countries and 9% from other Asian countries (FSO, 2024g). However, the breakdown varies over the individual years of entry.

For the first time, the Federal Statistical Office analysed the educational paths of young people who applied for asylum using longitudinal data and calculated their graduation rates (FSO, 2024g). Compared to previous cohorts (2012) of young asylum seekers, around 36% of those who entered Switzerland in 2017 had started or already completed a certifying post-compulsory education five years after entering Switzerland; in 2012, this figure was 23% of those who entered Switzerland. However, this rate depends significantly on the age of entry into Switzerland (→ Figure 115). Looking at the educational success of those who have started a certified post-compulsory education course, this is 86.8% – slightly higher than the rate of foreign national who completed school in Switzerland. This leads to the conclusion that those who start a certifying training at upper-secondary level, usually vocational education and training, represent a positive selection of people who have the same educational opportunities as persons with foreign nationality without asylum status and who attended school in Switzerland. However, as the proportion of persons who took up a certification course at all is very low, the educational success of the entire population in the asylum area is significantly lower than that of other persons with a migration background. Looking at the entire population of persons with asylum status, the graduation rate for these persons is only around 30%.

115 Admissions to certified upper-secondary education by age at entry

Persons from the asylum area who entered Switzerland in 2015 aged between 16 and 25 and were still in Switzerland five years later (= total population)

Data: FSO (2024g)



Educational pathways and non-cognitive skills

School skills or cognitive competencies are key to the education path following compulsory schooling. At the same time, international research literature shows that personal characteristics, known as non-cognitive skills (Heckman *et al.*, 2006), must also be taken into account to explain differences in educational achievement. The 2023 Education Report showed that the choice of type at upper-secondary level depends not only on cognitive skills at the end of compulsory education, but also on non-cognitive skills. This was demonstrated by the example of grit, a measure that expresses the ability to develop a specific goal and to pursue it persistently and passionately over an extended period of time (Duckworth *et al.*, 2007). It was found that apprentices who opted for vocational education and training had a significantly higher level of grit than young people who opted for a general education type (Albiez *et al.*, 2025). While non-cognitive abilities can explain decisions and results that cannot be explained or only partially explained by cognitive abilities, one disadvantage is that the spectrum of non-cognitive abilities is significantly wider than that of cognitive abilities at school. In order to obtain a more complete picture of the importance of non-cognitive abilities in explaining educational decisions and educational success, many different concepts would have to be analysed.

In addition to the influence of grit on the choice of education type at upper-secondary level, grit also has an influence on the specialisation chosen in the respective education path. In both types of education (general education and vocational education), young people with a higher level of grit tended to opt for an apprenticeship occupation or a baccalaureate special subject with higher requirements in the area of mathematical skills, irrespective of gender (→ Figure 116).

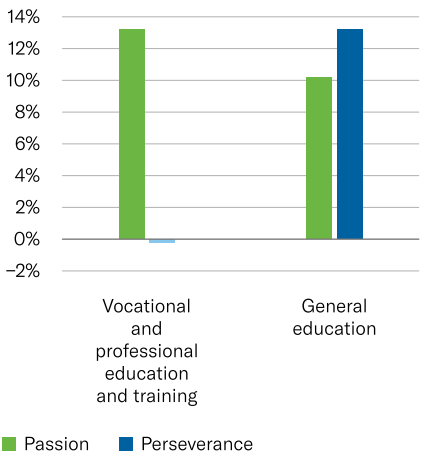
However, passion is the only decisive factor when choosing an apprenticeship with higher mathematical requirements, while passion as well as perseverance play a role when choosing a special qualification at a

The **grit concept** by Angela Duckworth (Duckworth *et al.*, 2007) consists of two different components. The first is a “passion” for something that is more than short-term enthusiasm. It is more about the ability to remain loyal to an interest over a longer period of time and not constantly change interests, in other words, to consistently take an interest in a certain subject. The second component is “persistence,” in other words, the ability to persist in pursuing a goal despite possible setbacks.

116 Influence of a higher grit on the mathematical requirements in the chosen degree programme

The bars show the changes in percent of a standard deviation of the dependent variable in the event of a positive change in grit by one point. The grit assumes values from 1 (lowest value) to 5 (highest value). The effects were calculated taking into account grades, gender, part of the country and other control variables.

Data: Albiez et al. (2025)



Reading example

Young people with a grit that is one point higher in the “passion” component chose apprenticeships that have higher mathematical requirements according to the requirements profile. The magnitude of the effect corresponds to around 13% of a standard deviation in the mathematical requirements of the professions. A similar high effect can be seen in young people with a higher “persistence” level who chose a special subject with higher mathematical requirements at baccalaureate school.

baccalaureate school with high mathematical requirements. It is important when interpreting the results that the personality traits are general characteristics and not specific attitudes to mathematics.

Digitalisation

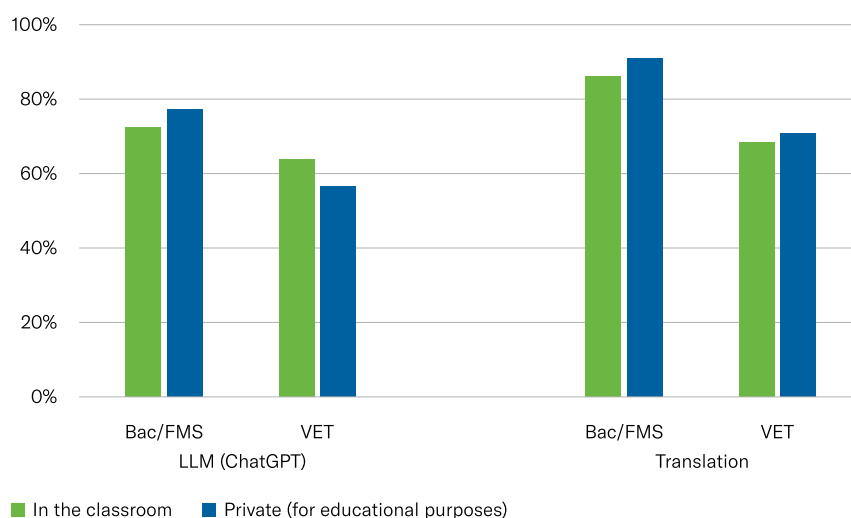
Digitalisation is changing not just the world of work, but also education and private life. Pupils at upper-secondary level are confronted with digitalisation not just at school, but also at home. Digital devices are therefore often used for both private and school purposes. In addition, apprentices who complete a company-organised vocational education and training also come into more or less intensive contact with digitalisation in the workplace. The dissemination and use of digital aids for the upper-secondary level was first recorded in autumn 2020 through regular monitoring (Oggenfuss & Wolter, 2021b). A second survey was conducted in spring 2021 (Oggenfuss & Wolter, 2021a) and a third in spring 2022 (Oggenfuss & Wolter, 2023); the last survey was conducted in spring 2024 (Oggenfuss & Wolter, 2024). The surveys allow both the observation of time trends as well as the comparison of the various types of education at upper-secondary level, in other words, between baccalaureate schools, upper-secondary specialised schools and vocational education and training. However, it only records the use of digital aids at school and at home for school purposes; use at the workplace or at home for private purposes is not the subject of this regular monitoring. A further limitation of this monitoring is that only the pupils’ point of view is obtained, in other words, no statements are made regarding the point of view of the teachers or the training companies. The major advantage of regular monitoring is that the analyses are carried out at the current stage in terms of time and can still be compared with data from previous surveys. However, with the last survey in 2024, the questionnaire introduced an innovation, namely the use of AI. This had not been included in previous surveys.

When using AI, there is a major difference in the frequency of use between pupils in general education compared to those in vocational education and training (→ Figure 117). At first glance, this difference in use at school may not come as a surprise, because AI tools are primarily used for work or can substitute work that is the norm in everyday school life, such as writing texts, researching information, condensing or translating. In addition, not all apprenticeships are equally exposed when it comes to deployment and use of AI, which could explain a certain distance between vocational education and training and the use of AI in a school context. On closer inspection, however, the result is somewhat astonishing, even if one considers that in the same monitoring process, around 80% of vocational education and training learners regularly stated that they use digital aids in their vocational training subjects, while the use of digital aids in traditional school subjects, with the exception of language subjects, is much lower (Oggenfuss & Wolter, 2024). In addition, other studies show that the degree of integration of digital technologies into teaching at vocational schools is higher than at general education schools (Cattaneo, Schmitz et al., 2025). In other words: The lower use of aids with AI cannot be attributed to the fact that vocational schools are generally less intensively digital than baccalaureate schools and upper-secondary specialised schools.

117 Use of instruments with AI, by education type and application form, 2024

Proportion of students using AI for school purposes

Data: SCCRE (Monitoring of digitalisation 2024); calculations: SCCRE



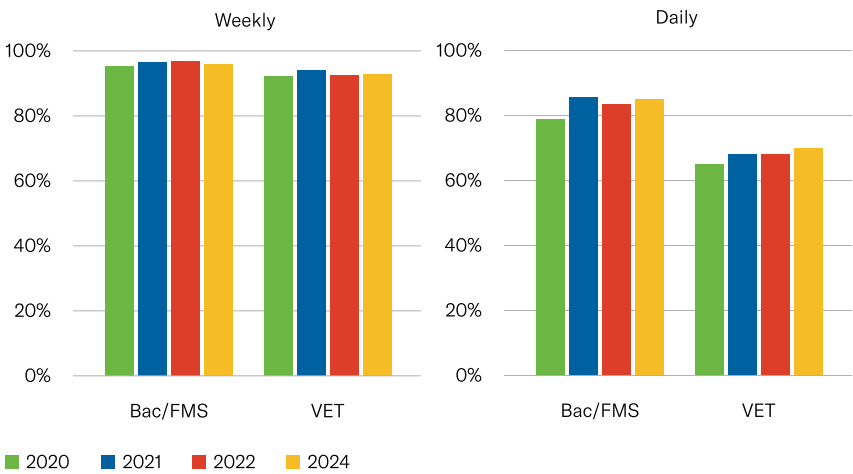
LLM Large Language Model

The frequency of use of digital aids at school may reflect the fact that students in vocational education and training only attend school for one or two days a week; moreover, not all come into contact with digital aids in their professional lives. A look at the daily use of digital aids reveals, on the one hand, an increase in the frequency of use of around six percentage points since the start of monitoring and, on the other hand, that the difference between pupils in general education (baccalaureate school and upper-secondary specialised school) and pupils in vocational education and training is stable at around fifteen percentage points (→ Figure 118). However, if one takes one-off use per week into account, there are only minimal differences between the education types of three to four percentage points. This is also due to the fact that since the start of measurement in 2020, only a small number in the single-digit percentage range reported using digital aids less than at least once a week for school purposes.

118 Percentage of pupils using digital tools

Daily and at least weekly use (computers, tablets, laptops) for school purposes; the values are checked according to gender, country region, age, migration status and socioeconomic origin

Data: SCCRE (Monitoring of digitalisation 2020–2024); calculations: SCCRE

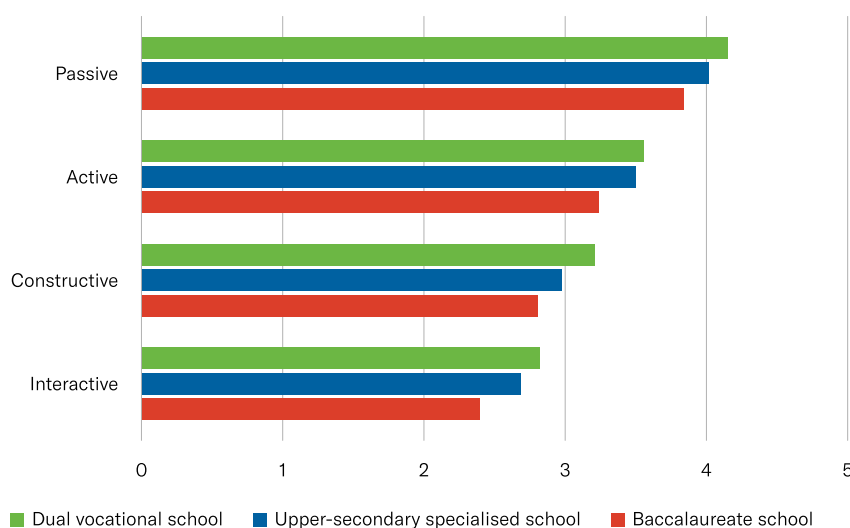


In addition to the role of pupils, that of teachers and school management was examined in various analyses of a project entitled “What is the state of digital transformation in upper-secondary education?” part of the National Research Programme 77. For example, a study on the use of digital technologies in vocational schools shows that the individual acceptance of technology by teachers influences the intention of using such technologies in the classroom positively (Antonietti *et al.*, 2022). Based on the type of employment, the teachers at upper-secondary level were divided into three types: There are those who only use technologies passively, for example only as a form of presentation; a second group uses them both passively and actively, in other words, to design learning activities using digital aids; and finally there are professional users who use digital technologies for various educational activities in a wide variety of settings (Antonietti *et al.*, 2025). In this analysis, which examined teachers at general and vocational schools throughout Switzerland, only 10% were assigned to the third type and almost 43% to the first type, in other words, to the passive. Interestingly, neither age nor experience or the type of education were significant predictors of which of the three groups a teacher belongs to. However, vocational school teachers were more likely to use digital technologies for cognitively challenging tasks (Cattaneo, Schmitz *et al.*, 2025). From the perspective of teachers, the study also recorded the frequency of use of digital technologies by type of use and application as well as by type of education. The sequence of the different application frequencies is identical for all types of education. Passive use is most frequent in practically every lesson and interactive use is least common. In all forms of application and use, however, teachers training apprentices in company-based vocational education indicated a slightly higher frequency of use than teachers in general education schools at upper-secondary level (→ Figure 119).

119 Frequency of use of digital technologies by application type and education type, from the perspective of teachers

Scale between 1 (almost never) and 5 (in practically every lesson)

Data: Gonon et al. (2024)



Passive: Teachers use digital applications to convey knowledge to learners.

Active: The students use digital applications to apply and practice knowledge.

Constructive and interactive: The pupils develop knowledge using digital applications, either individually (constructively) or together with others (interactively).

External school evaluation

External school evaluations at upper-secondary level have been carried out for all types of schools for many years. Although there is no legal obligation to participate at the federal level, there have been evaluations in 15 cantons since the 2004/05 school year¹. In many of these cantons, participation is compulsory for schools. By 2024/25, a total of over 370 evaluations took place at around 160 general education schools and vocational schools under the leadership of the Swiss Centre for Secondary Schools and for School Evaluations at Upper-Secondary Level (ZEM CES, until 2021 Institute for External School Evaluations at Upper-Secondary Level IFES IPES). In an evaluation cycle of around six years, all schools in a canton are evaluated externally. Many schools have undergone multiple evaluation cycles; the fourth cycle has been running since 2022/23 (→ Figure 120). Since 2017/18, an evaluation procedure has been in place that allows schools to participate in multiple steps and addresses current issues facing schools and cantons. More than half of the questions that have been evaluated since 2019/20 concerned the field of “Teaching, learning, learning culture”, often relating to digitalisation, professional competency orientation and/or self-organised learning. Around one-third dealt with questions about digitalisation and one-fifth with school culture (transversal questions counted multiple times). Several cantons provide a framework for the evaluation questions in current fields of development, such as the implementation of the cantonal digitisation strategy in teaching and schools.

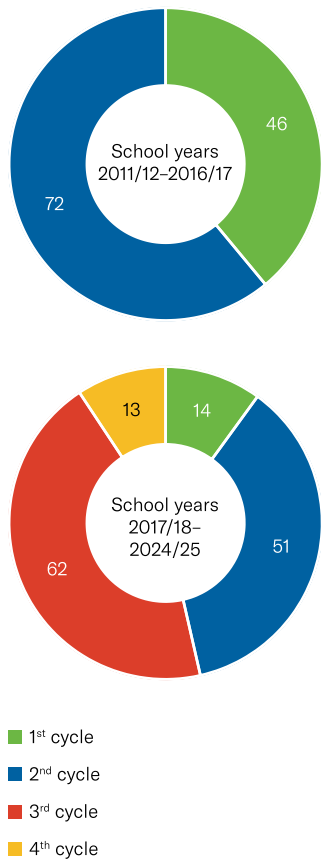
The new Article 28 of the revised **Ordinance on Recognition of Academic Baccalaureates** (MAV) and the new Regulations on the Recognition of Baccalaureates (MAR), which entered into force on 1 August 2024, oblige schools to have “a quality development and assurance system”. In accordance with the legislation of many cantons, this also includes the obligation to carry out external school evaluations.

¹ Schools were evaluated in the following cantons: Aargau, Appenzell Ausserrhoden, Bern, Basel Landschaft, Basel Stadt, Grisons, Lucerne, Obwalden, St. Gallen, Solothurn, Schwyz, Thurgau, Uri, Zug and Zurich.

120 Number of external school evaluations by cycle

Cycles correspond to the evaluation cycles of the IFES IPES (ZEM CES)

Data: ZEM CES (formerly IFES IPES)



Exchange and mobility

The promotion of exchange and mobility is enshrined in Swiss law (Art.14 LangA²). The national agency for exchange and mobility (Movetia) is responsible for promoting exchange and mobility both within Switzerland as well as between Switzerland and other countries. Movetia also gathers and publishes annual statistics on exchange and mobility activities. However, this data is not complete, as it is not always collected on a representative basis, neither is it consistently comparable for all cantons, especially since some of it is collected according to other criteria. Despite all the restrictions, Movetia’s data for the 2022/23 school year shows that almost 13,000 pupils took part in exchange activities at upper-secondary level, which represents significant growth compared to the figures reported in the last Education Report.

If we set the number of participants against the number of pupils at the corresponding level of education, broken down by general education and vocational education types, we can see that there are significantly higher school exchange rates in general education. This resulted in values of almost 10%, while the exchange rate in vocational education and training was just under 1%.³ However, the latter may be underestimated, as Movetia has little or no knowledge of in-house exchange programmes. As with mobility during compulsory education, a few cantons stand out with significantly above-average rates, for example, in general education, canton Lucerne with just under 40% or canton Valais with an annual exchange rate of over 35%. At the other end of the distribution, however, in the 2022/23 school year, there were cantons with an exchange rate of just under 1%.

2 National Languages and Understanding between the Linguistic Communities (Languages Act, LangA) of 5 October 2007.

3 The exchange rates were calculated on the assumption that pupils only took part in one activity per year. If this assumption did not apply, the exchange rate would be correspondingly lower.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

VOCATIONAL EDUCATION AND TRAINING

Context

Vocational education and training (VET), particularly company-based training, is more dependent on external factors than general education forms. As a market-based form of education, the number of company-organised apprenticeships can be attributed to the willingness of companies to undertake training and to school-leavers interested in vocational education and training. Global and national developments such as structural change or economic fluctuations primarily influence the apprenticeship vacancies, while demographic trends and changing preferences among young people shape the demand for apprenticeships.

Structural change and artificial intelligence

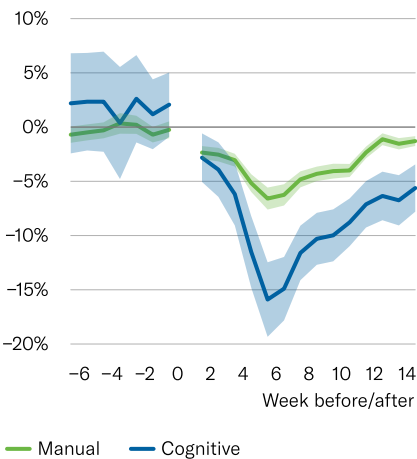
Technological developments such as automation, digital transformation and, most recently, AI are leading to changes in labour markets and thus also in vocational education and training. As a result, the demand for specific skills and competences is changing, but the task structures of professions and the need for different skilled workers are also subject to a transformation.¹ So far, structural change and the globalisation-induced shift of low-skilled work to low-wage countries have led to an increasing demand for high-skilled workers with strong cognitive skills. For example, the share of employees working in an intellectual and scientific profession increased from 7.3% to 26.8% between 1970 and 2023. The share of persons exercising a craft or related professions fell from 25.1% to 9.5% (FSO, 2024j). There is less demand for manual skills and routine activities in the wake of de-industrialisation, which leads to fears of a devaluation in vocational education and training (Kriesi et al., 2022).

It is unclear whether the rising demand for highly-skilled workers will continue. Developments in generative AI such as Large Language Models (LLM) are increasingly replacing cognitive skills such as writing or programming (Felten et al., 2023; Hui et al., 2024) and could therefore lead to a relative enhancement of manual skills. This also seems to be the expectation of young people. Shortly after the launch of ChatGPT in November 2022, searches for professions with strong cognitive skills on the apprenticeship certificate platform (LENA → margin text, page 140) plummeted significantly, while professions with strong manual skills were less impacted by this decline in searches (→ Figure 121). In many cases, however, Large Language Models are not likely to simply replace highly qualified workers, but rather complement their skills and thus lead to higher productivity (Autor et al., 2024), which in turn can alleviate the shortage of skilled workers.

In general, there is a great deal of uncertainty among the population as a result of the technological developments. This is shown by a Swiss study in which more than 6,000 adults were asked to evaluate different professional positions for a person at the age of 40. Their preferences indicated that they would be willing to accept a 20% lower income if the automation risk were 10%

121 LENA searches during the launch of ChatGPT

Data: Goller et al. (2025)



The semi-transparent areas show the 95% confidence interval.

¹ It is difficult to predict reliably which professional groups will be most affected: Although several studies quantify the exposure of individual professions, the results of the individual studies are only slightly correlated and sometimes contradict each other (Benites & Parrado, 2024).

lower. Interestingly, this preferred reduction in income is significantly lower for persons who have completed vocational education and training and no tertiary-level qualifications. This indicates that respondents want to protect the higher investments in a tertiary-level qualification more strongly from the risk of automation (Cattaneo, Gschwendt et al., 2025).

For vocational and professional education, the question of whether and how new technologies influence the training behaviour of companies is also raised. An initial study shows that companies in Germany which use AI tend to train more apprentices (Muehlemann, 2024). However, the study covers the period prior to the introduction of generative language models such as ChatGPT.

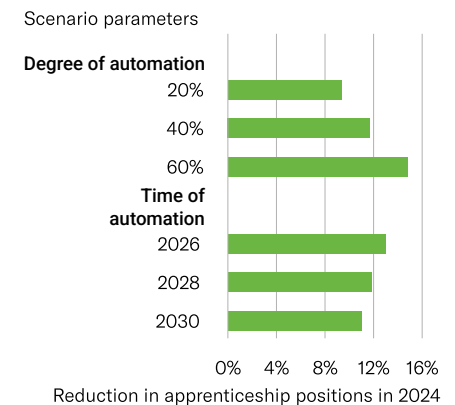
In spring 2024, a survey experiment was carried out in Switzerland with over 2,000 companies to investigate how HR managers assess the potential impact of automation on apprenticeship opportunities. Respondents were presented with scenarios describing the loss of certain work activities. These scenarios varied in terms of time horizon and extent of automation. The HR managers – who are also responsible for recruiting apprentices – were asked to assess the impact of the scenario randomly assigned to them on the number of apprenticeship vacancies in autumn 2024. On average, they expected an immediate and significant decline in the number of available apprenticeships (→ Figure 122). Interestingly, however, this estimated decline in apprenticeship vacancies was lower than the decline in labour activities assigned in the scenario. The participants apparently assumed that some of the tasks no longer required could be compensated for by new ones. In addition, occupations with an already high level of automation displayed significantly stronger responses to the scenarios than professions with a manual focus. This indicates the impact of the spread of AI as a new perceived driver of automation.

In addition to technological and economic developments, vocational education and training is also being affected by the climate and current energy crises. On the one hand, these developments are leading to increased demand for certain skilled workers and to employment growth in these professions, for example among specialists in engineering or building technology (→ Figure 123). Accordingly, two new vocational education and training courses were introduced in 2022 using the accelerated process: Solar installer with VET diploma and solar installer with VET certificate. On the other hand, existing professions are being reformed based on sustainability aspects. In some professions in building technology, for example, the duration of apprenticeship has been extended from three to four years. As part of the funding priority “Sustainable development in vocational and continuing education and training,” the State Secretariat for Education, Research and Innovation (SERI, 2020) has developed a guideline for this. The Federal Offices for the Environment (FOEN) and Energy (SFOE) are now involved in the revisions of the VET ordinances and sustainability aspects are being systematically integrated into the required action skills and performance objectives (Pusterla et al., 2023). Education for sustainable development is enshrined in the core curriculum for general education, in the Federal Vocational Baccalaureate Ordinance and in the core curricula for VET managers issued in 2025.

Climate change and environmental awareness also influence career choices. For example, young people living close to recent climate protests are more likely to choose professions which have the potential to actively improve the environment, such as forestry warden, electrical planner or ventilation

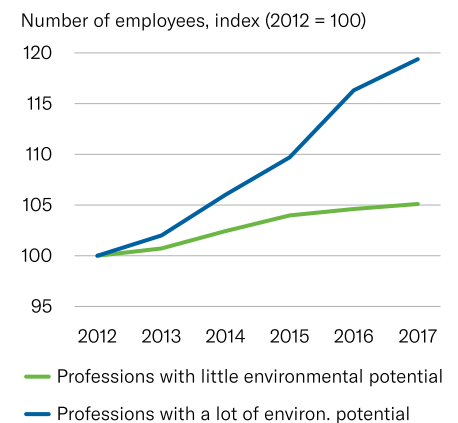
122 Expected decline in apprenticeships due to fictitious automation scenarios

Data: Centre for Research in Economics of Education at the University of Berne



123 Employment growth according to the environmental potential of professions

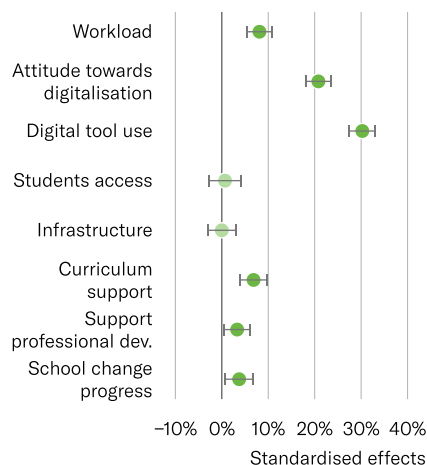
Data: Lobsiger & Rutzer (2021)



In order to assess the environmental potential of professions in Switzerland, the study uses data from the US career information database O*Net, which contains information on skills and the extent of environmental activities carried out by employees in a profession. Using this data, the authors trained machine-learning algorithms to establish a correlation between skills and environmental activities and transferred the skills profiles of the O*Net database to Swiss professions. It is thus possible to estimate the extent to which ecological activities are possible for Swiss professions (ISCO 08).

124 Factors related to self-reported digital skills

Data: Cattaneo et al. (2022)

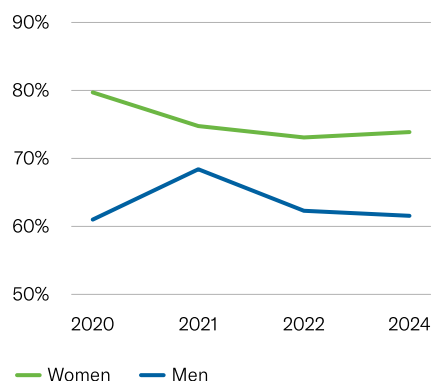


Reading example

Vocational school teachers who use a standard deviation of more frequent digital tools in class rate their digital skills around 30% higher. Light points are not statistically significant.

125 Shares of daily use of computers and notebooks

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



The shares of daily use of computers, notebooks or tablets are shown, taking into account personal characteristics and language region.

system engineer. Conversely, regional differences in social norms, which have been quantified based on voting behaviour on environmental issues, do not correlate with an environmentally friendly career choice (Lehnert & Pfeifer, 2024).

Digital transformation

Digital skills are increasingly in demand on the labour market. On the one hand, new apprenticeships are being created to meet this increased demand. On the other hand, digitalisation is also taken into account in the professional development process and in the resulting training ordinances and plans.² For example, new communication technologies have been introduced in the trading and sales sector or a new focus (online trading) has been introduced in the commercial sector (Pusterla et al., 2023).

In addition to developing digital skills, digitalisation is also relevant for overall learning success, as digital resources can accelerate learning processes and improve learning performance as well as motivation (Dahalan et al., 2024; Educa, 2021). Decisive factors here are the digital skills and technology acceptance of vocational school teachers: Those who perceive digital tools as helpful are also more likely to want to use them (Antoniotti et al., 2022). According to self-assessment, the digital skills of vocational school teachers do not differ significantly from those of other teachers. Vocational school teachers who have a positive attitude towards digital technologies and who use them regularly rate their digital skills more highly (→ Figure 124). Causality can work in both directions, for example if technically-oriented teachers make more frequent use of digital tools. Interestingly, the school infrastructure, the stage of development of the school in terms of digital transformation and the students' access to digital tools do not correlate significantly with the teachers' self-assessed digital skills. Provision of a high-quality digital infrastructure is therefore not decisive. The survey also shows that teachers with a higher workload tend to rate themselves as more competent. This could be attributed to the fact that part-time teachers often have a secondary job and thus have less time to acquire and develop digital skills (Cattaneo et al., 2022).

Digitalisation monitoring shows how widespread the use of digital devices is in vocational education and training (Oggenfuss & Wolter, 2024). Of the people surveyed there who are undergoing vocational education and training, 67.6% stated that they use a computer, notebook or tablet every day in training companies (→ Figure 125). While this share has remained relatively stable over the last four years, women reported daily use significantly more often. This is astonishing in that technology-intensive professions – such as computer scientists – are usually chosen by men. The more frequent use indicates that basic digital skills are also important in professions typical for women and should therefore be promoted.

The latest survey also studied the use of AI tools. Generative AI (such as ChatGPT) as well as translation and language tools (such as DeepL) are used significantly less frequently by people in vocational education and

² To this end, the State Secretariat for Education, Research and Innovation (SERI, 2022) has published the “Digital Transformation Guidance”, with the aim of supporting professional organisations in taking the need for digital skills into account in professional development.

training than by baccalaureate students (→ Figure 126). There are likely to be major differences between the individual apprenticeship professions, but these could not be investigated in the survey.

Demographics

After a decline in entry cohorts in the area of vocational education and training since 2015, an increase was recorded again for the first time in 2022. This development is likely to continue in the coming decades, as the number of pupils in compulsory education has been increasing for several years. The corresponding development in terms of qualifications is delayed, so that the number of federal VET diplomas (VETD) will decrease slightly by 2026 (→ Figure 127). The Federal Statistical Office (FSO) forecasts an increase of 16% for vocational education and training as a whole between 2024 and 2033, with the professional fields of IT and communication technology as well as health and social affairs in particular growing strongly in percentage terms. However, the number of retirements will increase more sharply by 2029, which will initially exacerbate the shortage of skilled workers. After this, the situation should ease up again.

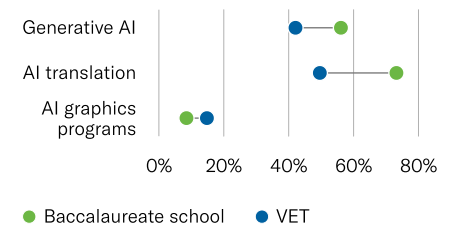
The situation of admissions to two-year vocational education and training with a vocational certificate (VETC) and also, with a time lag, that of VETC qualifications depends heavily on the development of immigration, particularly of persons applying for asylum. The refugee wave of 2015 led to an increase in VETC admissions until 2019, after which the numbers declined. Due to the situation in Ukraine, new VETC admissions are expected to increase again from 2023. This trend is likely to make itself felt in the case of VETC qualifications (→ Figure 127) from 2025.

Economic situation and willingness to learn

In general, economic crises and recessions lead to a decline in apprenticeship vacancies, for example, because apprenticeships are lost when companies go bankrupt or companies discontinue or reduce their training activities. Whether and to what extent the economy influences the number of apprenticeships depends on various factors, such as the simultaneous demographic development or the severity and duration of the recession (Lüthi & Wolter, 2020). In addition, current research results show that the various apprenticeships are affected to varying degrees: Professions with a comparatively high proportion of generic skills react more strongly than professions in which company- and occupation-specific skills are more important (Morlet & Bolli, 2025). In the latter case, it is more difficult to recruit comparable skilled workers from the labour market; accordingly, companies react less strongly to cyclical fluctuations in orders and apprenticeship training substitutes the hiring of trained skilled workers to a lesser extent. Whether or not a company trains apprentices also depends on the recruitment costs, which in Switzerland correspond to around a quarter of an annual salary and are therefore considerable. These costs are mainly due to the onboarding time of newly recruited workers. The higher the costs are, for example when the labour market is strained, the more it is worth training your own apprentices (Aeppli et al., 2024).

126 Shares of weekly use of AI tools, by education level

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE

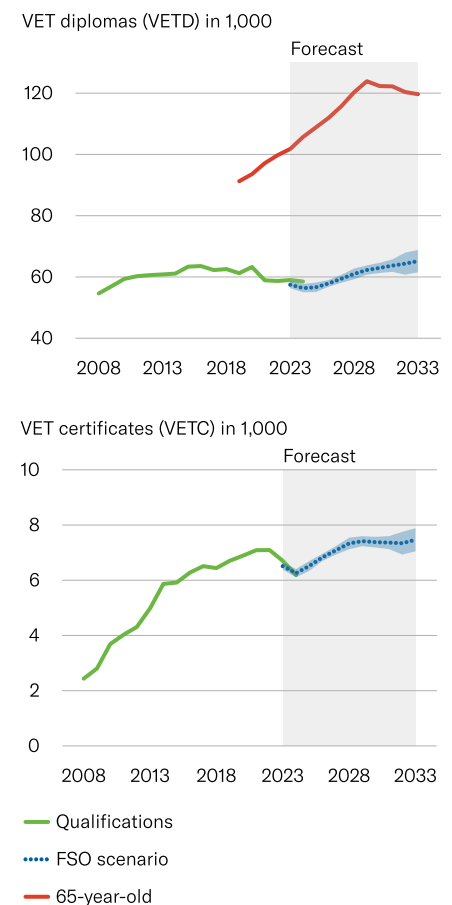


Reading example

Taking personal characteristics into account, 42% of persons in an apprenticeship use generative AI tools such as ChatGPT at least once a week at home for school tasks.

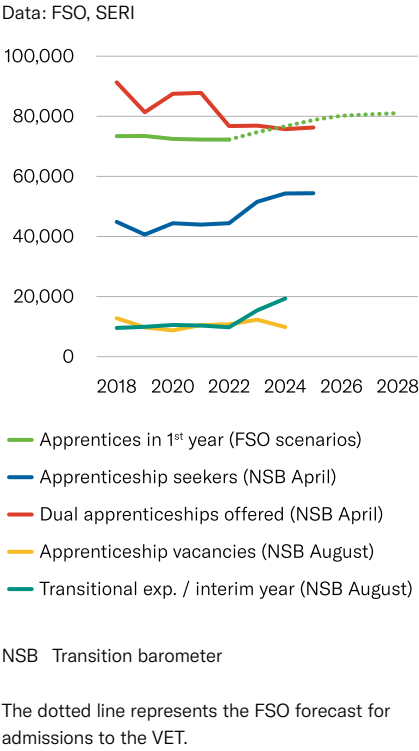
127 Predicted development of VET diplomas and VET certificates and the number of 65-year-olds

Data: FSO



The blue line represents the FSO reference scenario, the blue area the scenarios "low" and "high".

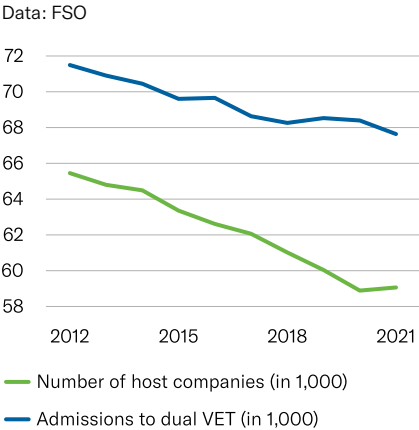
128 Supply and demand for apprenticeships



Apprenticeship market

Due to the declining demographic trend up to 2023, it will be increasingly difficult for companies to recruit suitable candidates, depending on the apprenticeship profession; according to the transition barometer, there are more young people interested in an apprenticeship and fewer apprenticeships on offer (→ Figure 128). Some companies have therefore probably decided to reduce or even discontinue their training activities (→ Figure 129). With more pupils completing compulsory education again since 2023, the number of apprenticeship seekers will also increase. This raises the question of how companies will react to this change in trend: Companies that have not trained apprentices for some time are unlikely to start doing so again, at least in the short term. There is, therefore, a danger that, from the point of view of apprentices, the apprenticeship situation will become increasingly strained in the coming years. Two reports have therefore recently examined the issue of maintaining and creating opportunities for apprentices. A report by the Federal Council (2022a) discusses relevant aspects such as the cost-benefit ratio, flexibility, reduced regulation, process optimisation and professional development. The other report from the Swiss Federal University for Vocational Education and Training commissioned by the canton of Zurich (Aeschlimann et al., 2024) identifies various fields of action for promoting apprenticeships, such as optimising existing support offers for the active support of companies or communication measures on the value of training.

129 Number of training companies and admissions to the dual VET system



Institutions

Vocational education and training in Switzerland is managed within the framework of the joint partnership between the federal government, the cantons and professional organisations. Centralised national management by the federal government takes account of the fact that vocational education and training is intended to train young people who can be mobile throughout the Swiss labour market – and even beyond, if possible. Learners therefore depend on the highest possible standardisation of qualifications. Cantonal implementation not only ensures alignment with regional job markets (industries, occupations, etc.) but plays a decisive role for interaction with compulsory education and other upper-level secondary education types. Professional organisations are responsible, among other things, for the educational content and national qualification procedures. In doing so, they help to ensure that the training courses meet the demands of working life.

Vocational education and training, 2030

In 2016, the State Secretariat for Education, Research and Innovation (SERI) launched a process with its partners to develop a long-term strategy for vocational education and training, which led to the “Vocational education and training, 2030” initiative one year later. This now forms the guiding principle for the long-term strategy. The initiative develops and supports measures for further developing vocational education and training and improving the surrounding framework, without aiming for a fundamental change of direction. The initiative prioritises six directions of impact:

- The orientation of vocational education and training towards life-long learning, for example in the field of *Vocational qualifications for adults* (page 136) or based on the assessment of the positioning of professional education institutions (→ *chapter Professional education*, page 303);
- digitalisation and new learning technologies, for example with the optimisation of data flows between stakeholders in vocational education and training (“optima”) or with the “Digital Transformation Guideline” (SERI, 2022) for professional development (→ *Professional development and reforms*, page 134);
- the development of models for school education or for vocational schools in order to make the educational offer more flexible; investigation of the need for adjustments in the area of the Federal Vocational Baccalaureate in the “Federal Vocational Baccalaureate 2030” project (→ *Vocational baccalaureate and Passerelle*, page 135);
- strengthening information and advice by developing a national strategy for vocational, study and career guidance or by revising the qualification profile and the passing rules for vocational, study and career guidance advisers;
- reducing the density of regulation and bureaucracy;
- optimising governance and strengthening the cooperative partnership (SCCRE, 2023).

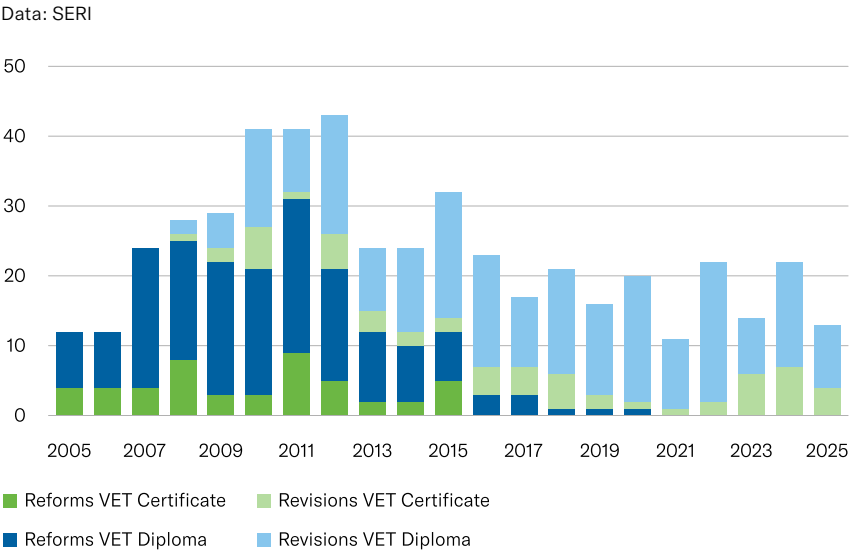
European developments: Special case Switzerland

The VET systems of individual countries are subject to constant reforms and development processes influenced by contextual factors and political processes. According to a Cedefop study (2020), there is a trend towards systemic diversification, for example, through the expansion of general education elements within vocational education and training, through dual qualifications and hybrid forms between school and in-company training. This is also the case in Switzerland with the introduction of the federal vocational baccalaureate. At the same time, however, Switzerland is one of the few countries with a stable VET rate and developments that strengthen VET profiles, such as the strengthening of tertiary-level professional education (→ *chapter Professional education*, page 303), the integration of health-care, agricultural and social professions into dual-track vocational education and training programmes and the creation of the Federal VET certificate (Kriesi et al., 2022).

Professional development and reforms

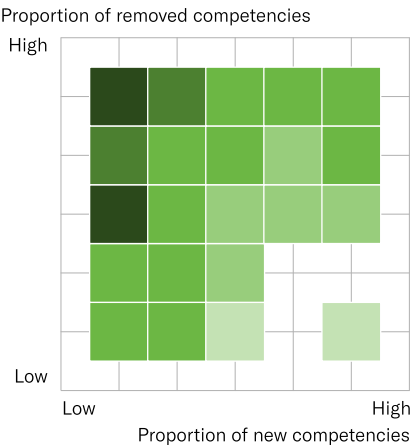
Following the entry into force of the new Federal Vocational and Professional Education and Training Act³ in 2004, practically all training and examination regulations were reformed and replaced by VET ordinances by 2016. The focus is now on less in-depth revisions (→ Figure 130).

130 Number of reforms and revisions



131 Income effects during revisions, heat map

Data: Bühler, Lehnert et al. (2024)



The darker the colour, the higher the increase in income with corresponding revisions. No data is available for the transparent fields.

The vocational education and training ordinances and plans are reviewed at least every five years under the responsibility of the professional organisations and updated if necessary. These revision processes ensure that the skills to be acquired are up to date and in addition promote the diffusion of technology and innovative capacity of the companies (*Schultheiss & Backes-Gellner, 2024*). An analysis according to which these revisions can lead to graduates of the revised vocational education and training courses earning a higher income underlines the importance of periodic revisions (*Bühler, Lehnert et al., 2024*). However, the manner in which the revisions are carried out is decisive. A low rate of new skills is more effective in terms of wages, especially if skills are simultaneously removed from the education plan (quadrant top left in Figure 131). On the other hand, a low removal rate with several new skills at the same time is less advantageous (quadrant bottom right). These findings therefore show that removing outdated skills is important and that educational curricula should not be overloaded.

According to the latest cost-benefit study (*Gehret et al., 2025*), most companies believe that the education ordinances and plans suit their own needs well. Companies consider about 82% of the training content specified in the training plan to be relevant for their own company. Depending on the apprenticeship, this share varies between 75% (logistics specialist) and over 90% (care and community health assistance professional).

3 Federal Act on Vocational and Professional Education and Training (Vocational and Professional Education and Training Act, VPETA) of 13 December 2002.

Vocational education and training with certificate

The two-year training courses leading to a VET certificate (see also → *Integration, page 148*) replaced both basic apprenticeships and the previous two-year diploma courses. They enable trainees to enter the labour market and at the same time offer the opportunity to transfer to a three- or four-year apprenticeship with a federal VET diploma. While the number of qualifications with a federal VET certificate has steadily increased in the first fourteen years since its introduction, the share has been declining since 2022 due to demographic trends.

The proportions of VETC qualifications vary greatly from canton to canton. One possible reason for this is that transitional training sometimes replaces VETC apprenticeships. Overall, however, there is no clear correlation between VETC shares and the frequency of transitional training (→ Figure 132). VETC apprenticeships are more common in some cantons such as Glarus, Solothurn and Lucerne, while in other cantons such as Vaud, Basel Stadt and Valais transitional training is more common. However, there are also cantons in which both shares are smaller, such as Appenzell Innerrhoden, Nidwalden, Schwyz and Fribourg. This is likely to be due to a lower proportion of persons with a corresponding need or to fewer training companies.

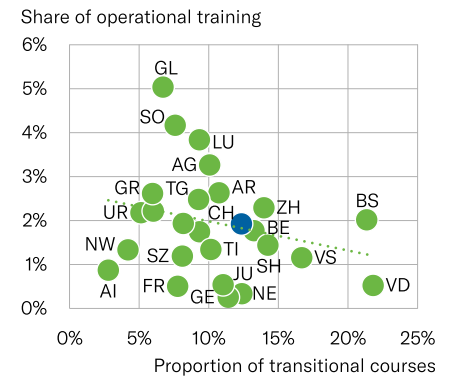
Vocational baccalaureate and Passerelle

The federal vocational baccalaureate (FVB) generally entitles holders to examination-free admission to studies in a field at universities of applied sciences that is related to their vocational education and training. Learners can qualify for the vocational baccalaureate firstly in parallel with a VET programme (FVB1), secondly by training for at least one year after completing the VET programme (FVB2), or thirdly by passing the Federal Vocational Baccalaureate Examination. According to the Federal Statistical Office (FSO), the number of FVB2 degrees increased by more than 12% between 2014 and 2023. The fact that the number of FVB1 qualifications has fallen by 13% at the same time is likely to be a demographic effect, as the number of apprentices has fallen over the same period. As a result, the share of apprentices who successfully completed a FVB1 remained relatively constant (→ Figure 133).

Labour market demand for tertiary degrees remains high and the shortage of skilled workers is therefore mainly concentrated on university graduates (*Wunsch, 2014*). In view of the stagnating federal vocational baccalaureate rates for FVB1, efforts are therefore being made to further strengthen the federal vocational baccalaureate.⁴ However, it is unclear whether the focus should primarily be on apprentices or training companies. Many companies fear that apprentices with a FVB1 will be in the company less often due to the additional school lessons and will therefore be able to perform

132 Proportion of VET certificate and share of transitional courses

Data: FSO (LABB); calculations: SCCRE

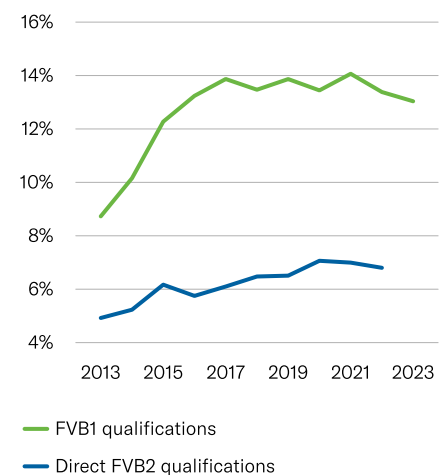


Reading example

Of all persons who completed compulsory education between 2018 and 2021, 5% entered a VET certificate (VETC) in the canton of Glarus, while 6.7% completed transitional education.

133 Proportion of VET diploma graduation cohorts with FVB

Data: FSO (LABB); calculations: SCCRE



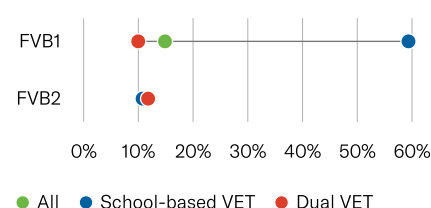
FVB1 graduations shows the proportion of persons who successfully completed FVB1 in the final year of their VET diploma.

Direct FVB2 qualifications shows the proportion of persons who successfully completed a FVB2 no later than one year after completing their VET diploma for the same cohorts. Some apprentices do not start a FVB2 until later or take longer to complete their qualification. These are not taken into account here.

4 As part of the "Federal Vocational Baccalaureate 2030" project, a joint strategy has been developed to strengthen the Federal Vocational Baccalaureate. Based on this strategy, the Federal Council adopted a total revision of the Federal Vocational Baccalaureate Ordinance in 2025, which will enter into force on 1 March 2026. Among other things, the reform includes the introduction of English as the third compulsory language, more flexible guidelines for interdisciplinary work and the promotion of blended learning. It has now also been stipulated that the written final examinations must be prepared and validated on a cantonal or inter-cantonal basis.

134 Proportion of apprentices with FVB, by VET form

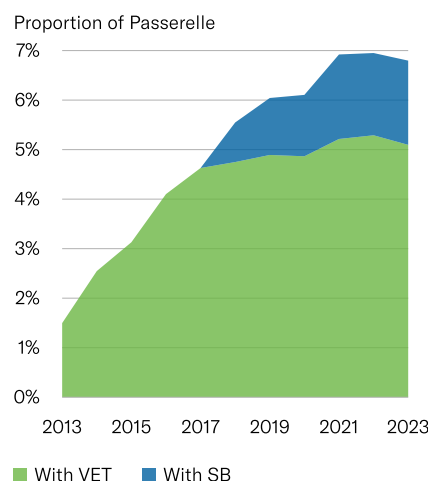
Data: FSO (LABB); calculations: SCCRE



The VET diploma graduation cohorts in 2021 and 2022 were taken into account for the rates. The FVB2 rate shows the shares of graduation cohorts who completed a FVB2 directly in the VET diploma final year or in the following year.

135 Share of Passerelle as a percentage of all university admission authorisations

Data: FSO (LABB); calculations: SCCRE



less productive activities, which reduces the benefits for companies while maintaining the same costs (Trede et al., 2020). According to the transition barometer (Golder et al., 2023), the additional absences are also the main reason why companies do not offer participation in the federal vocational baccalaureate. However, a total of around half of the companies surveyed stated that they offered the option of FVB1, which should be sufficient to increase the FVB1 rate. In particular, larger companies and those with a high proportion of tertiary-qualified employees (Wilhelmi, 2022) offer apprentices the opportunity to complete a FVB1; this is not least a recruitment argument for good pupils. Companies that make it possible to take part in the federal vocational baccalaureate receive significantly more applications than other training companies (Trede et al., 2020). The fact that, according to the transition barometer, only very few young people (3 to 7%) stated that the companies were the reason for their non-participation also speaks against companies preventing them from participating in FVB1.

On the other hand, the major differences depending on the type of VET diploma training indicate that training providers certainly play a role (→ Figure 134). Significantly more trainees complete a federal vocational baccalaureate (FVB1) in school-based VET programmes than in dual VET programmes. The proportion is more than five times as high. This difference has been roughly the same for at least a decade. Part of this can be attributed to the choice of career and the different preferences of the apprentices. But even after taking into account these selection effects, school-based vocational trainees have a 23 percentage points higher probability of completing FVB1 (Lüthi, 2025). Differences in the decision for or against FVB1 are not necessarily caused by companies refusing FVB1 participation, but often because school-based providers require such participation. Other than with FVB1, the probability of starting a federal vocational baccalaureate (FVB2) after the Federal VET Diploma is about the same for both forms of training.

Persons with a federal vocational baccalaureate can take the supplementary exam “federal vocational baccalaureate – university” (called “Passerelle”), which enables access to universities. Since its introduction in 2012, the number of these supplementary exams (Passerelle) has steadily increased (→ Figure 135). Since 2018, however, this increase has been largely caused by graduates of upper-secondary specialised schools, who since then have also had access to the Passerelle. In contrast, the exam rate has stabilised with persons who have completed vocational education and training. Every year, around 7% of all persons with a university admission authorisation currently acquire access through the Passerelle, while the rest gain access to a university via the baccalaureate. Men are overrepresented among vocational education and training graduates who take the exam; women make up the majority of those who come from an upper-secondary specialised school. This corresponds to the gender distribution in vocational education and training and in upper-secondary specialised school. Considering the relative shares, these are balanced.

Vocational qualifications for adults

In 2023, 14% of the 25- to 64-year-olds in the permanent resident population of Switzerland had no post-compulsory education. This corresponds to around 530,000 adults, of whom 70% were in employment, 23% were

not in employment and just under 7% were unemployed. There is therefore potential for professional qualifications for adults, especially among 40 to 54-year-olds and foreign nationals (Renold et al., 2023). Since 2014, the promotion of vocational qualifications for adults has also been a focus of activities of the network partners in vocational education and training.

Various opportunities exist for adults – in other words, persons aged 25 and over – to obtain a vocational qualification. Around half of all qualifications are attained via traditional vocational education and training with an apprenticeship contract (→ Figure 136). This can also be shortened if certain educational achievements can be credited against previous training. In addition, persons with professional experience can be admitted directly to the qualification procedure (QP). Around nine out of ten vocational qualifications are obtained through these three procedures. In addition, other procedures exist, in particular the validation of educational achievements; their certification is not based on an examination, but on evidence of professional skills and requirements of general education. Validations are mainly relevant in the area of health and social affairs as well as in the commercial area, and they also affect older people more often: If only the 35–65 age group is considered instead of the 25–65 age group, the proportion of validations doubles to almost 15%. But even in this age group, more than four out of five persons acquire a qualification through traditional and shortened vocational education and training with an apprenticeship contract as well as through direct qualification procedures. According to a survey by the network partners, these are also well established and continue to be worthy of support (Renold et al., 2023). The value of the different access routes in the labour market is shown by a study in which fictitious applicant profiles were evaluated by employers (Aerne & Bonoli, 2022). The traditional route via dual vocational education and training received the highest rating. Direct examinations and validations performed slightly worse, but still significantly better than applications from people without a federal VET diploma. The alternative methods thus lead to much better labour market opportunities, although they are not quite as well assessed as traditional vocational training, as the alternative methods are not considered to be strict enough.

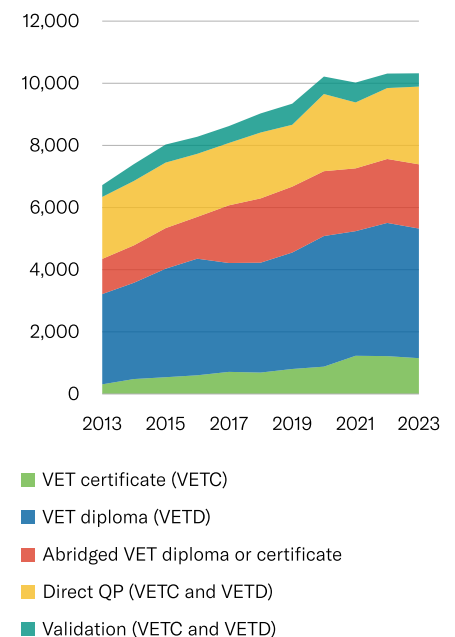
Vocational orientation and career guidance

While parents are responsible for choosing a career, career orientation is anchored in Lehrplan 21; however, it should be noted that this requirement has not yet been systematically implemented (Neuenschwander, 2022). Depending on the canton, young people have access to career-oriented institutions, such as vocational guidance counselling (BIZ), mentoring/coaching programmes or case management for vocational education and training. Bridge-year courses are also available to support the career choice process, such as the motivation semester and various cantonal projects and initiatives such as LIFT. The usefulness of many of these services is largely unknown (Neuenschwander, 2022; Neuenschwander & Schaffner, 2010).

The effect of career guidance measures is difficult to assess, particularly due to the selective use of the offers. This is made clear in Figure 137. It shows how support from different groups of persons during the career choice process is related to the probability of successfully completing an apprenticeship. This means that persons who take part in mentoring or coaching

136 Number of VET qualifications of adults, by type of qualification

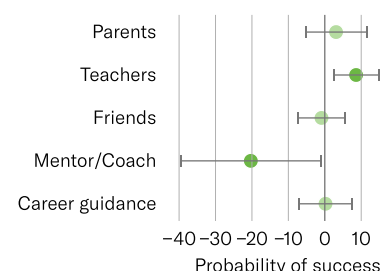
Data: FSO (SBG-SFPI); calculations: SCCRE



Persons with a missing year of birth and those with split examinations were not included here.

137 Effects of supporting (person) groups on training success

Data: SERI (transition barometer), FSO (LABB); calculations: SCCRE



Reading example

Persons who stated in the transition barometer that they had been supported by teachers in their training decisions have a 8.6 percentage points higher probability of completing their apprenticeship directly (without delay, changing training type or dropping out).

The effects are not statistically significant for the points shown in light colours. For the direct qualifications, all persons who started vocational education and training in 2018 were taken into account.

programmes are less likely to complete an apprenticeship directly. However, this is attributable to the selection – only persons with difficulties in transitioning to vocational training participate in the support programmes.

Teachers, on the other hand, seem to have a positive impact on success in transitioning to the upper-secondary level, as Figure 137 shows. According to a survey, teachers – in addition to parents and the internet – are also rated by young people as particularly helpful in choosing a career; this effect is stronger in Switzerland than in Germany or Austria (*Thurnherr et al., 2013*). Vocational guidance at lower-secondary level can thus make a decisive contribution to success in vocational education and training. However, it is possible that teachers are influenced by their own career aspirations (*Epp, 2018*).

Job trade fairs are another way of finding out about different professions. These trade fairs lead to significantly more searches on the apprenticeship platform LENA in the cantons in which they took place. However, there is a difference between the traditional trade fairs with physical events and the new virtual formats. While the former tend to narrow down the range of searches for different apprenticeships, the virtual formats extend the search queries to more professions (*Goller et al., 2024*).

Effectiveness

The effectiveness of vocational education and training can be considered at both the systemic and individual levels. The latter covers, for example, the impact of vocational education and training on cognitive skills and labour market success and is discussed later in this chapter. The systemic level concerns questions regarding the overall impact of the VET system, for example on the innovative capacity of companies. Two factors are decisive here: On the one hand, regular revisions of training plans as part of professional development lead to a diffusion of new technologies in companies. On the other hand, the permeability between vocational education and training and the tertiary level promotes innovation; in Switzerland, this mainly takes place through the universities of applied sciences (*Backes-Gellner & Lehnert, 2021*).

Career choice and suitability

A good fit between the interests and abilities of young people and the activities and requirements of the target profession can be decisive. Those who were dissatisfied at the end of the apprenticeship with the training occupation or the work situation during the apprenticeship will change occupation more often up to ten years after completing the apprenticeship (*Medici et al., 2020*).

Regional differences in the apprenticeship markets are also important for matching skills, aptitudes, preferences and the apprenticeship offer, as a study using the canton of Bern as an example shows (*Kuhn, 2022*). Including detailed individual data and taking into account the catchment areas of the young people's individual places of residence, the study shows that there are not only a larger number of apprenticeships in the urbanised regions – especially around the city of Bern – but also more different training occupations.

On average, the apprenticeships chosen in urban areas are also more demanding and more person-oriented due to the strong service sector (→ Figure 138). Regional economic structures can also partly explain the gender-specific differences in career choice (→ *Choice of profession and gender*, page 146).

At an individual level, choosing a career is a complex decision-making process that is influenced by many factors, such as personal interests, career ideas and preferences, gender, the requirements profile of lower-secondary education and the cognitive, non-cognitive or practical abilities of the individual. For example, people with a higher grit⁵ value are more likely to learn professions with higher mathematical requirements (*Albiez et al., 2025*). Young people often choose the same training as their role models or stay in the same profession in which they completed their first trial apprenticeship (*Neuenschwander et al., 2018*). Peers at lower-secondary level also influence the choice of career: Apprentices in particularly competitive classes tend to choose occupations that enable a higher average income at the age of 30 as well as more cognitively demanding and popular professions. This is shown by a study in which the competitive preference of entire school classes was measured on an experimental basis. Around two years after the experiment, apprentices with more competitive classmates select and successfully conclude higher-paid professions, although some of them take longer to complete their apprenticeship (*Schilter et al., 2024*).

Another important factor is the reputation of the individual professions. When choosing a career, young people consider the reputation and social status of the professions in society. This can be seen at the WorldSkills competition. If Switzerland wins a gold medal, the media report on it, which triggers a positive reputation shock for the profession in question. This leads to 7% more search queries on the LENA apprenticeship platform and 2.5% more apprenticeship contracts. However, these effects are only apparent in cantons where vocational education and training is less popular (*Goller & Wolter, 2025*).

Termination of apprenticeship contracts

According to the Swiss Federal Statistical Office (FSO), 24% of all dual VET diploma apprenticeship contracts were terminated prematurely for the 2018 entry cohort, while the figure for VETC apprenticeship contracts was 26%. The proportions vary depending on the industry. VET certificate apprenticeship contracts are more likely to be terminated if apprentices perceive their situation as unsuitable, for example in terms of the target profession, the required skills or the necessary support from the in-company trainers. On the other hand, apprentices who terminated their apprenticeship contract prematurely do not rate their stress level as higher (*Bosset et al., 2022*). Apprentices who perceive their apprenticeship as unsuitable, have little confidence in their own abilities or have a strained relationship with their employer also tend to be less willing to continue their current education (*Findeisen et al., 2022*).

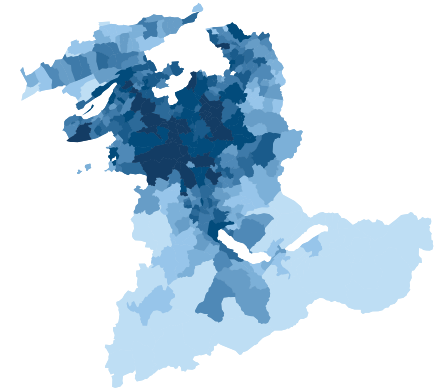
However, early termination of an apprenticeship contract does not always mean dropping out from vocational education and training. After an

⁵ The concept of grit involves the ability to develop a passion for a specific goal and, in addition, to pursue this goal over several years without being thrown off course by setbacks.

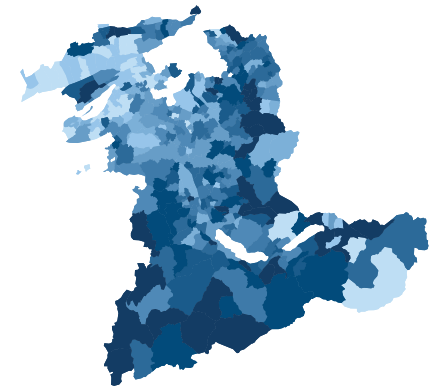
138 Regional apprenticeship markets in the canton of Bern

Data: Kuhn (2022)

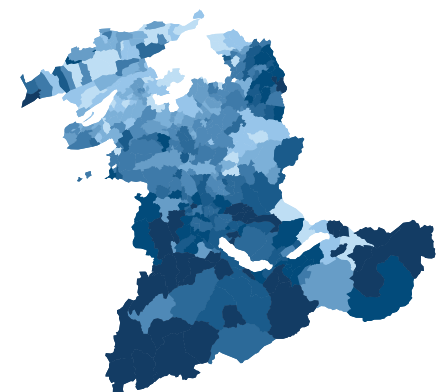
Number of apprenticeships offered
(Dark regions = more apprenticeships)



Requirement level
(Lighter regions = higher level)



Person orientation vs. orientation to things
(Lighter regions = person orientation)

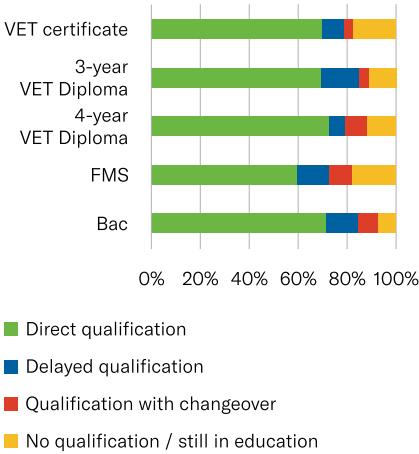


The **requirements level** shows the basic academic knowledge requirements for each profession. In professions with a high level of **person orientation**, people tend to work together with other people, while in the case of **orientation to things**, people tend to work with things.

139 Education path by training type

Entry cohort 2018

Data: FSO (LABB); calculations: SCCRE



The red shares only indicate changes between the five training types shown, but not changes in training occupations or specialisations. These were then taken into account in the blue category if they caused a delay. Graduations up to 2023 were taken into account.

VET Diploma	3-year/4-year apprenticeship
FMS	Upper-secondary specialised school
Bac	Baccalaureate

apprenticeship contract is terminated, almost 80% return to an apprenticeship. Termination of apprenticeship contracts is therefore usually associated with a change (of the apprenticeship or form of training) and often leads to a delay, for example if an apprenticeship year is repeated. Such changes and delays also occur to a similar extent in general education schools, as Figure 139 shows. The share of direct qualifications among those completing a four-year apprenticeship (73%) is similar to those of baccalaureate pupils (72%). It is lowest among persons attending an upper-secondary specialised school (60%). Vocational and professional education is therefore no more affected by non-linear educational pathways than general education.

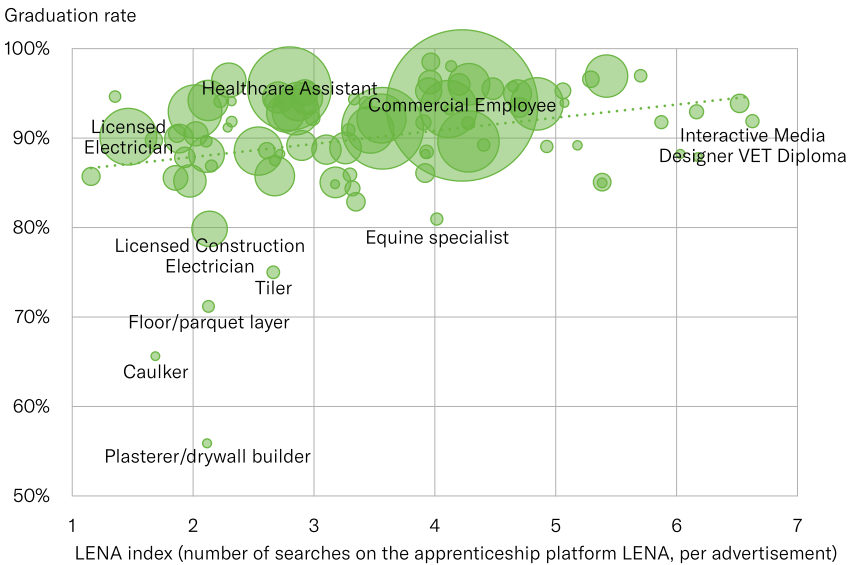
Apprenticeship completion and qualification procedure

Successful completion of an apprenticeship requires, firstly, that the apprentice does not drop out during the apprenticeship and, secondly, that they pass the qualification procedure. Failure to pass the qualification procedure is less common than dropping out of the apprenticeship. The reasons for dropping out of an apprenticeship are complex. An internationally oriented meta-study (Böhn & Deutscher, 2022) cites the following main reasons: low income from training, an apprenticeship that does not correspond to the apprentice’s dream job, low level of education of the apprentice, poor performance in training, a learning disability, a higher age at the start of an apprenticeship and a migration background. The fact that career choice has an impact on success is also demonstrated by Figure 140: The more popular the apprenticeships (approximated by the LENA search queries per job advertisement), the higher the average graduation rate. However, the correlation is relatively weak, as unpopular professions with high graduation rates also exist, such as licensed electricians.

140 Graduation rate vs. appeal of apprenticeships

Cohort that started vocational education and training in 2017; the size of the groups corresponds to the number of persons in the respective profession.

Data: FSO (LABB); calculations: SCCRE



The LENA index is based on data from the national apprenticeship platform LENA. The data covers all ads posted on the platform by apprenticeship occupation, and how often young prospects query the various fields. The index calculated from this shows the average number of search queries per apprenticeship occupation and month, relative to the number of apprenticeships in this occupation. The index thus represents an indicator of the appeal of the individual apprenticeship occupation.

Little research has yet been carried out on the role of training companies. However, the quality of training can be a decisive factor: Professions with below-average graduation rates also have a significantly below-average quality of in-company training (Graf *et al.*, 2024). This is also confirmed by a new study investigating the relationship between success and the questions answered by the training companies regarding the training process. It shows that apprentices are particularly successful if companies give them tasks that enable them to find their own solutions and if the apprentices complete a wide variety of tasks (af Burén & Schweri, 2024).

Of the candidates who start the qualification procedure (QP) after completing their apprenticeship, 94% pass at the first attempt and around 99% pass in further attempts (Graf *et al.*, 2024). These graduation rates are stable over time, with the exception of 2020, when parts of the qualification procedure could not be carried out due to the COVID-19 pandemic. The qualification procedure usually consists of the elements of professional knowledge, general education, practical work and the experience grade; there is an optional partial examination in the second year of apprenticeship. Depending on the profession, some of these elements count as case grades, and failure to pass such elements with case grades will result in failure to pass the qualification procedure, regardless of the performance in the other elements. The practical work is almost always defined as a case grade, which means that it most often leads to failure, followed by the professional skills (→ Figure 141). High examination quality is therefore particularly important in practical work, which is causing difficulties in some professions due to the increasing shortage of trained examination experts.

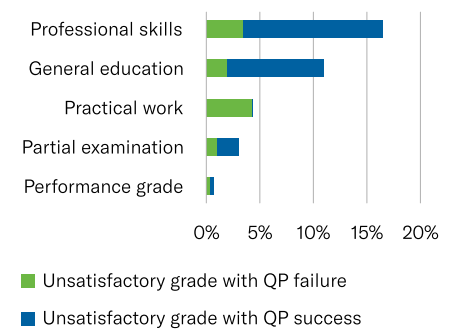
Labour market entry and income

Graduates of vocational education and training are comparatively successful in integrating into the labour market. Young people who are completing vocational education and training with relatively low cognitive requirements benefit in particular. Their unemployment risk falls by 50% compared to persons without a post-compulsory qualification, while their income increases by around 10%. Among the less gifted at school, manual and higher cognitive abilities in particular protect against unemployment, while gifted learners maximise their income by choosing academically challenging professions (Girsberger *et al.*, 2022). However, periods of unemployment are particularly disadvantageous for people whose highest educational qualification is vocational education and training. In a study, for example, employers rated graduates of vocational education and training significantly worse if they were unemployed after completing their apprenticeship. This “scarring effect” did not occur in the study amongst persons without post-compulsory education and was less pronounced amongst persons with a tertiary qualification (Shi & Di Stasio, 2022).

Firm-based or dual VET programmes are particularly effective for entering the labour market (Lüthi, 2025). Compared to people with a school-based VET, people with a dual programme belong to the group of NEETs (= not in Education, Employment or Training) for around one month less in the first year after completing their studies. This causal effect is very pronounced, as it is roughly equal to the average number of NEET days. Graduates of dual programmes benefit in two ways: Firstly, some of them can stay

141 Proportion of VET apprentices with unsatisfactory grades

Data: Graf *et al.* (2024)

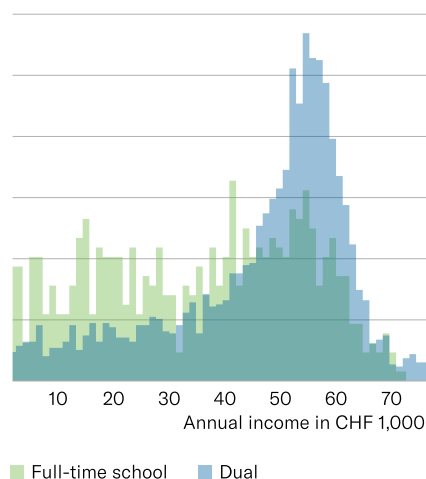


Reading example

16% of apprentices have insufficient grades in vocational skills (green and blue bar), while 13% still pass the QP (blue bar). The data comes from the canton of Bern (2018–2023, the 2020 Coronavirus year was not included).

142 Annual income in the first year after completing vocational education and training, by form of training

Data: SCCRE (SEATS I); calculations: SCCRE



directly in the training companies. Secondly, their performance during the apprenticeship is also better: They pass the qualification procedures more frequently and take less time overall to complete their apprenticeship. Non-cognitive skills such as motivation, the ability to work in a team or the ability to solve problems could be decisive here, as these can potentially be better learned in companies than in a purely school-based environment. This also leads to a higher income for persons with a dual qualification. As shown in Figure 142, these persons are less likely to work in jobs with very low incomes, such as fixed-term contracts, part-time work or internships.

Mobility and job-specific skills

Vocational education and training teaches more job-specific skills than general education. Although these help with the transition to the labour market, they lead to lower incomes in the long term, as such skills become obsolete more quickly than general skills. However, vocational education and training itself is highly heterogeneous, which is not taken into account in such dichotomous comparisons between vocational and general education and training. Differences in professional development can also be observed in vocational education and training. For example, generic IT skills are associated with wage growth after a job change, while job-specific IT skills, on the other hand, are associated with a decline in income. However, this effect only occurs in professions with a high proportion of job-specific skills (Eggenberger & Backes-Gellner, 2023). Persons who have learned such a specialised profession with high practical requirements generally remain in the same profession more often and switch less frequently to jobs with a lower socio-economic job status at short notice. In contrast, persons with a more generalist profession are more mobile in the medium term (up to the age of 30). They tend to switch to professions with a higher status (Grønning & Kriesi, 2022).

Transfer to tertiary education and training

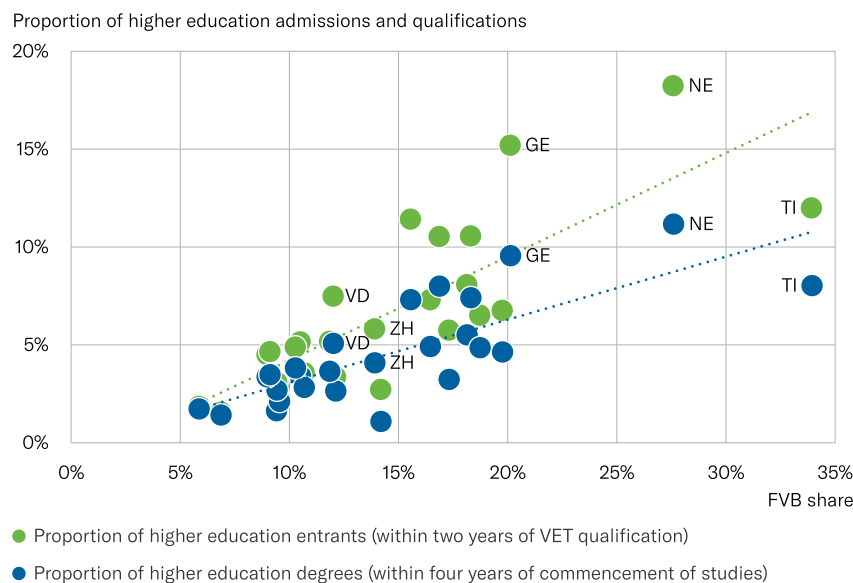
For VET graduation cohorts, there are two main pathways to tertiary-level education, namely through a degree at a university of applied sciences or a qualification in professional education (PE) qualification (→ Figure 143). Around 15% start studying at a university of applied sciences within eight years of completing upper-secondary education. Slightly more than 20% of the cohort enter professional education. Most of these persons do not have a vocational baccalaureate: Persons with a federal vocational baccalaureate who transition to professional education account for only around 2% of the entire cohort. Other transitions, such as to tier-one universities (via the Paserelle) and to universities of teacher education, are also rare. Measured in absolute figures, more admissions to tertiary level education are in the area of professional education. However, the probability of transitioning to tertiary level education is significantly higher for persons with a federal vocational baccalaureate at around 71% than for graduates with a VET but without a federal vocational baccalaureate (around 11% → *chapter Tertiary-level education, page 189*).

Figure 143 also shows that persons with a federal VET diploma rarely move to the tertiary level immediately after completing their apprenticeship, but usually only after a few years of professional experience. This applies in particular for transitions to professional education. The corresponding aspirations also develop comparatively late. Apprentices in vocational education and training change their educational aspirations more often than persons attending general education schools. Unlike at the end of compulsory education, FVB1 graduates want to enter a university of applied sciences three years later more frequently, but less frequently a university. Among people without FVB1, the share of those who want to study at a university of applied sciences or professional education doubles later. These changes are particularly pronounced for persons whose parents do not have a tertiary education (Ackermann & Benz, 2023).

Whether someone enters higher education with a vocational baccalaureate depends on individual characteristics, but also on the canton of residence. Federal vocational baccalaureate rates vary greatly between the cantons, largely due to the different admission criteria (Hänni *et al.*, 2022). In cantons with a high rate, more people start a higher education course (usually at a university of applied sciences), although the increase is not entirely proportional (→ Figure 144).

144 Share of FVB, higher education admissions and degrees

Data: FSO (LABB); calculations: SCCRE

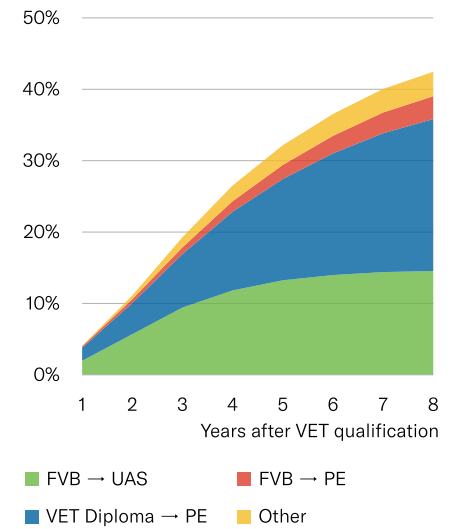


Reading example

In the canton of Ticino, 34% of people with a VET diploma complete a federal vocational baccalaureate (FVB), 12% enter higher education directly and 8% graduate from higher education. All persons who successfully graduated with a VET between 2015 and 2017 and higher education degrees up to 2023 are taken into account.

143 Admission to tertiary level, by education path

Data: FSO (LABB); calculations: SCCRE



Reading example

Three years after completing their vocational education and training, 9.4% of the cohort started at a university of applied sciences (after obtaining their federal vocational baccalaureate). The cohort that completed the VET in 2015 was taken into account.

However, students with a federal vocational baccalaureate have lower skills on average in cantons with high federal vocational baccalaureate rates (SCCRE, 2023). This in turn is reflected in the graduation rates: The higher the cantonal federal vocational baccalaureate rate, the lower the probability of obtaining a higher education degree within four years of starting studies, and the higher the probability of dropping out of studies. This relationship is also non-linear. With regard to all persons with a federal VET diploma, there are still more higher education degrees in cantons with a higher proportion of persons with a federal vocational baccalaureate. Some of the apprentices thus benefit from easier access conditions to the federal vocational baccalaureate; at the same time, however, these conditions also increase the risk of dropping out of studies or a longer period of study.

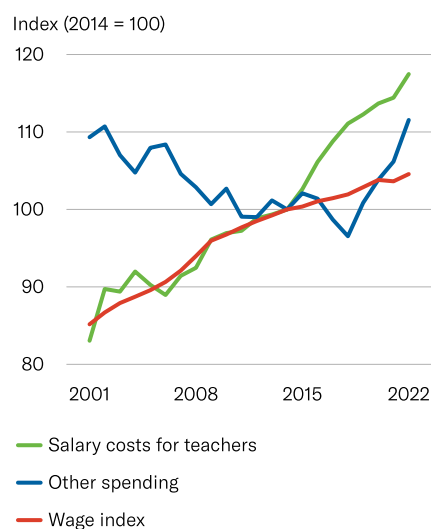
Efficiency/costs

How efficiently resources are used can be assessed from the perspective of the learners, training companies, or the public. For an unbiased assessment and a comparison of efficiency, however, essential data is missing for practically all education levels and types (Wolter et al., 2020). Based on the available data – and taking into account inputs and outputs at cantonal level – there is at least no indication that public spending on vocational education and training is being used more inefficiently today than in the past according to an efficiency comparison over time; the latest efficiency monitoring of the Swiss cantons confirms this (Soguel et al., 2024).

Continuous increase in costs per person

145 Development of VET education spending per person in education, 2001–2022

Data: FSO; calculations: SCCRE



Considered per person, public spending on education in vocational education and training has risen continuously in the past. This can be attributed to the salary costs of teachers, as other expenditure (salaries of other staff, general and administrative expenses, other current expenditure and investment expenditure) per person remained stable (→ Figure 145). However, the increase in the nominal salaries of teaching staff only explains the growth in wage costs to a limited extent. More importantly, the number of teaching staff did not decrease to the same extent during the period of declining apprenticeship numbers, which led to an increase in expenditure per person on vocational education and training. Compared to compulsory education, however, vocational and professional education and training is better able to adapt costs to the number of apprentices, especially in the case of company-organised apprenticeships (Lüthi & Zumbühl, 2024). In view of the current rise in the number of apprentices, it can be assumed that the cost per person is likely to increase less sharply than the wage index in the future.

Costs and benefits among apprenticeship companies

In recent years, the federal government and the cantons have spent slightly more than CHF 3.5 billion a year on VET (FSO, 2024v). In the case of company-organised vocational education and training, however, there are also

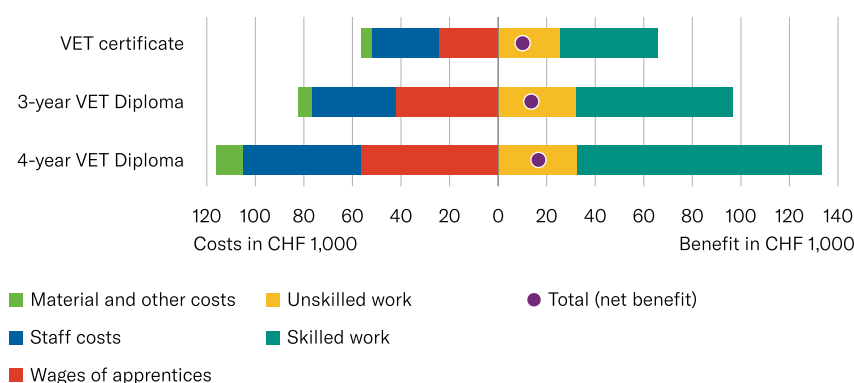
the costs incurred by companies: All training companies together invest around CHF 5 billion a year. These costs are offset by a somewhat higher benefit in the form of productive services. In the 2022/23 year of apprenticeship, these amounted to around CHF 5.7 billion. In net terms, apprentices in company-based vocational education and training thus generated a net benefit of around CHF 800 million per year, as the latest cost-benefit study shows (Gehret *et al.*, 2025). The average net benefit per apprenticeship year and apprenticeship contract is CHF 4,500.

The benefits for companies is the result of the productive work of the apprentices. In order to assess this benefit, the study asked 6,655 training companies (as well as 3,655 non-training companies) how much time the apprentices spend in unskilled activities, skilled activities and other activities such as exercises. Unskilled activities are usually performed by unskilled workers, while skilled activities are performed by skilled workers. Working hours for unskilled activities are remunerated with the lowest salary paid in the company. The working hours for skilled worker activities, on the other hand, are multiplied by the usual company salary of a skilled worker and remunerated with a level of performance estimated by the companies. These productive activities account for around four-fifths of attendance time in the companies.

The benefits for companies are offset by the costs, which are mainly made up of wages for apprentices and costs for trainers. Both the costs and the benefits increase over the course of training. In terms of costs, this is mainly due to the rising salaries of apprentices. On the benefits side, the value of skilled worker activities in particular is increasing, as apprentices are able to perform such activities more and more frequently and, on the other hand, become more effective and productive. As a result, VET diploma courses still generate net costs in the first year (the costs exceed the benefits), but these are usually compensated in later years of the apprenticeship. For this reason, terminating apprenticeship contracts at the beginning of the apprenticeship programme entails costs for companies. In addition, since the value of the skilled worker's activity increases more than the costs over the course of training, four-year training results in a higher net benefit (around CHF 17,500 on average) than a three-year apprenticeship with a federal VET diploma (almost CHF 14,000) and vocational education and training with a vocational certificate (around CHF 9,600 → Figure 146).

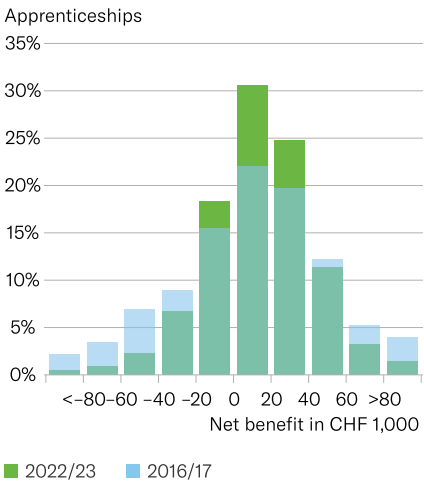
146 Costs and benefits of a VET, by training type

Data: Gehret *et al.* (2025)



147 Net benefit of training companies, 2022 and 2016

Data: Gehret et al. (2025)



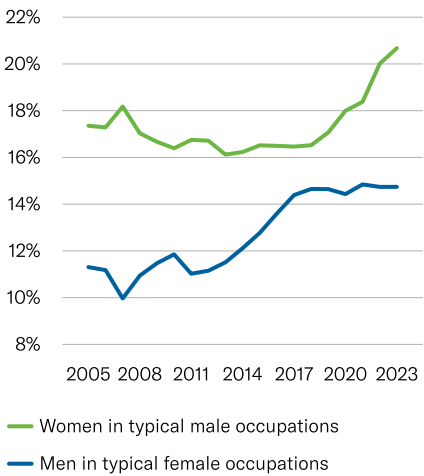
Compared to the survey in the 2016/17 training year (Gehret et al., 2019), the net benefit of two- and three-year vocational education and training has not changed significantly on average. By contrast, the net benefit of the four-year vocational education and training now amounts to CHF 17,510, which is significantly higher than in 2016/17, when it was CHF 8,630. The reason for this is, on the one hand, the reforms of some three-year apprenticeships – they have been expanded to four-year apprenticeships – and, on the other hand, the improvement and simplification of the survey instrument, which may have influenced the assessment of the share of skilled worker activities. Overall, this has reduced the share of companies with very high net costs – and to a lesser extent with very high net benefits. The share of companies with a moderate net benefit has increased (→ Figure 147).

Equity

Choice of profession and gender

148 Atypical career choice

Data: FSO (SBG-SFPI); calculations: SCCRE



Reading example

The share of women who have chosen a profession in which more than 60% of apprentices are male is shown in green. The share of men who have chosen a profession in which more than 60% of apprentices are female is shown in blue.

The choice of career remains strongly gender-specific: Men often choose male-typical professions, while women often choose female-typical professions. This also has a heavy impact on the employment situation and income at the age of 30 (Hupka-Brunner & Meyer, 2023). Women are more likely to choose gender-atypical professions than men, as Figure 148 shows; this trend has increased over the past five years. Men, on the other hand, increasingly chose female-typical professions in the 2010s, and this rate has stagnated ever since.

There are many reasons for this segregated career choice. One reason discussed in the literature is own identity and social norms, which dictate what is appropriate and what is not for which group of people. This shows that young people in mostly rural regions with less egalitarian social norms in terms of gender roles are more likely to choose gender-typical professions. However, this correlation between regional norms and career choice is only apparent for men (Palffy et al., 2023a).

One explanation for this correlation is the influence of parents. They are also more likely to work in gender-typical professions in rural areas, possibly because of different preferences, but also because of different economic structures. On the one hand, parents can serve as role models and thus explain the influence of regional norms on career choice (Kuhn & Wolter, 2023). On the other hand, parents' preferences also differ, as a recent survey experiment shows (Wolter & Zöllner, 2025). While both women and men expressed gender-neutral preferences for apprenticeships for their daughters, the majority of them preferred male-typical professions for their sons (→ Figure 149). At the same time, young men are less willing to change their career preferences, as shown by an intervention study (Palffy et al., 2023b). The intervention led to an increase in applications by women in typical male professions, while men did not change their application behaviour.

In addition to parents, other role models can also influence the choice of career, such as fellow pupils at lower-secondary level. For example, pupils in ethnically heavily mixed classes tend to choose professions that are more person-oriented and therefore more typical for women. These classes,

which are characterised by a high fragmentation of the languages spoken at home, promote the development of social skills that are important for personal professions. On the other hand, highly polarised classes in which there are only a few ethnic groups of a similar size lead to a less person-oriented career choice (Pregaldini et al., 2025).

The literature also discusses possible differences in the area of personal characteristics. For example, women tend to shy away from a competitive environment. As a result, women are less likely to apply for apprenticeships after company information events if the event emphasised the selectivity of the application process (Schilter, 2025).

Socio-economic status

The socio-economic background of the young people shapes the choice of education. Children of parents with a tertiary qualification attend a baccalaureate school more often (→ *chapter Baccalaureate school, page 151*). The situation is similar when transferring to university. After baccalaureate school, people with an advantageous socio-economic background are more likely to transfer to university. However, this does not apply to VET graduates. For these, socioeconomic status has no influence on the probability of transferring to a university (excluding universities of applied sciences). Interestingly, people with higher expectations of their profession at the age of 30 are no more likely to study at a university (Burger, 2023).

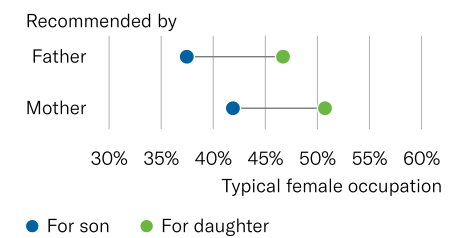
Socioeconomic status (SES) correlates not only with the type of education (baccalaureate versus VET), but also with the choice of career. Socioeconomically disadvantaged people tend to choose less demanding apprenticeships than those who are socioeconomically advantaged, although this difference is largely due to the division into different requirement profiles at lower-secondary level (SCCRE, 2023). If we look at the career choice, which varies according to socioeconomic status, it becomes clear that class composition also plays a role. Socioeconomically disadvantaged persons are thus significantly less likely to choose a profession with high mathematical requirements if their fellow pupils have better mathematical skills (Brox et al., 2025). This effect of the relative rank of one's own mathematical competence within the class is significantly lower for persons whose parents have a university degree (→ Figure 150).

Persons with a migration background

Foreign nationals and persons with a migration background often aspire to more challenging courses than native learners with the same level of competence. This phenomenon, which is often referred to as *immigrant optimism*, is also evident in Switzerland, where migrants prefer general education rather than vocational education and training. While this effect remained stable over the period 2000–2016, it varies in intensity from group to group; for example, it is less pronounced among people of European origin and second-generation migrants (Nennstiel, 2022). In people from Balkan countries, Turkey and Portugal, the effect only occurs in men (Glauser & Becker, 2023). In addition, the effect decreases the longer persons with a migration background live in Switzerland. The effect is not

149 Share of persons who prefer a gender-typical profession for their child

Data: Wolter & Zöllner (2025)

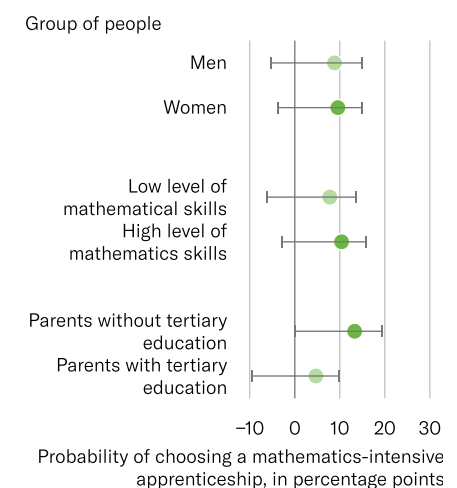


Reading example

37.5% of all male test persons and 41.9% of all female test persons prefer a female-dominated occupation for their hypothetical son.

150 Effects of maths rank by gender, maths skills and SES

Data: Brox et al. (2025)

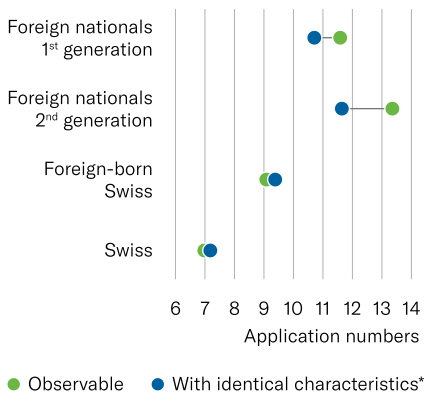


Reading example

People with parents without a tertiary qualification who are among the best in their class in mathematics have a 13.3 percentage points higher probability of choosing a mathematics-intensive apprenticeship than persons who have the same mathematical abilities but are among the worst performers in their class. This difference is not significant for men, persons with low mathematical skills and persons whose parents have a university degree (points in light colours).

151 Average number of apprenticeship applications

Data: SERI (transition barometer); calculations: SCCRE

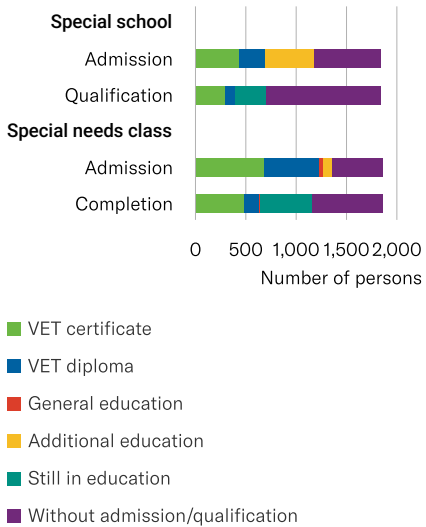


Reading example

Foreign nationals of the 2nd generation send out an average of 13.4 applications.
* Taking into account gender, age, lower-secondary level requirements, school grades (maths, languages, English), parents' educational level, requirements profile of the chosen teaching profession and regional characteristics, it would be expected that they would still send out 11.6 applications.

152 Selection of upper-secondary education for persons in separate classes

Data: FSO (LABB); calculations: SCCRE



Additional training is practical training (PrA), for example, or non-recognised commercial secondary schools. Persons who first completed this type of additional training and then a VET diploma or a VET certificate are assigned to the VET diploma or the VET certificate in the chart. Transitional training was not taken into account, only the subsequent training.

observable with persons from a country with a similar VET system to Switzerland and for persons with a parent born in Switzerland (Bolli & Rageth, 2024). This suggests that a lack of information is at least partly responsible for these differences in preferences, underlining the importance of providing appropriate and early information to foreign learners and their parents (Kamm et al., 2023b). The qualitative evidence in this regard shows that there is no lack of knowledge about the education system, but that certain beliefs are firmly entrenched. The prevailing view is that general education is hierarchically superior to vocational education and training and that the former is the only way to be successful on the Swiss labour market (Kamm et al., 2023a). Foreign language-speaking people, on the other hand, are more likely to opt for vocational education and training than general education if the share of foreign language-speaking peers at lower-secondary level was higher. They also tend to choose apprenticeships with lower language requirements. This suggests that this effect can be attributed to less pronounced language skills among persons with more foreign language-speaking peers (Chuard et al., 2025).

It is not always easy for young people from abroad who opt for VET to find an apprenticeship. This is reflected in the fact that they submit significantly more applications than Swiss nationals. One possible reason for this is the *immigrant optimism* mentioned above. When migrants apply for more demanding apprenticeships, their success rate is lower. This in turn leads to more applications. The unexplained differences in the number of applications are reduced when taking into account the skills, the requirement level of the chosen profession and other characteristics (→ Figure 151). However, significant differences remain, especially among persons from the Balkan countries and Turkey (Nennstiel, 2021). While this cannot be interpreted as direct evidence of discrimination, a discrimination based on nationality – as observed, for example, in the hospitality industry (Auer et al., 2019) – cannot be ruled out in vocational education and training.

Integration

One of the advantages of vocational education and training is its inclusive nature. A US study shows that persons with disabilities who start vocational training are more likely to complete it without delay, find a job and earn a higher income than those in general education schools (Brunner et al., 2025). In Switzerland, more than half of persons who completed lower-secondary education in a special needs school or special needs class in 2018 started vocational education and training, mostly with a vocational certificate, as Figure 152 indicates. The figure shows the average number of persons in separate classes, their first selected education at upper-secondary level (admissions) and their first qualification type. The cohort that completed compulsory education in 2018 is taken into account. Many of these persons had previously completed training at upper-secondary level. Around 50% of this entry cohort had a qualification four years later, while just under 30% were still in education. This shows that low-threshold offers such as vocational education and training with a vocational certificate are decisive for this group of persons. However, for a conclusive assessment of the integration effect of vocational education and training, there is a lack of comparative values with education systems organised differently.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

BACCALAUREATE SCHOOL

Context

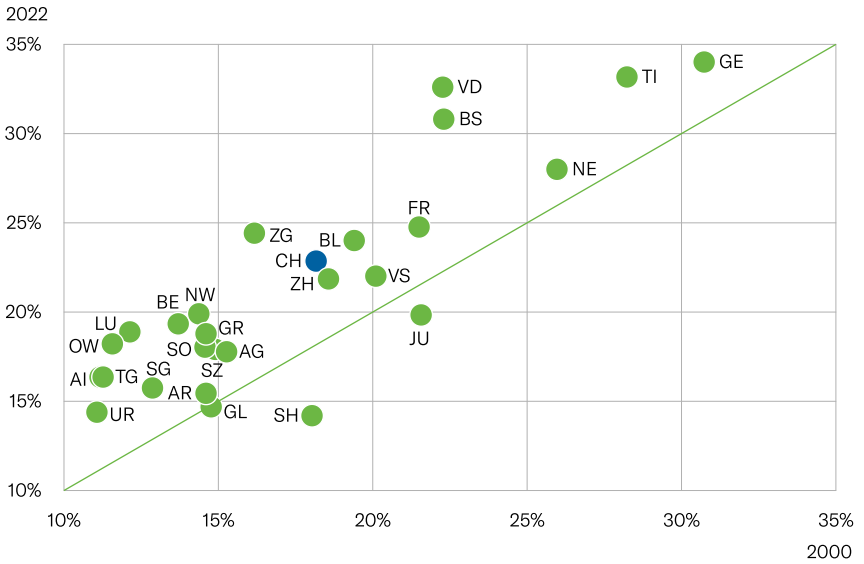
Increase in baccalaureate rates over time

The **baccalaureate rate** corresponds to the share of young people among the reference population of the same age who have obtained a baccalaureate certificate by the age of 25. The Swiss Federal Statistical Office (FSO) calculates each year's rate as a three-year average. The rate for 2022 therefore corresponds to the average rates for the years 2021–2023. In this chapter, unless further specified, the terms “baccalaureate” and “baccalaureate rate” refer to the baccalaureate gained at a baccalaureate school and the corresponding baccalaureate rate.

The baccalaureate rate was 22.9% throughout Switzerland in 2022, up slightly from 2000. This is evident in almost all cantons. This is why the major cantonal differences of the last decades remain practically unchanged. In 2022, the highest cantonal baccalaureate rate was 34% – 2.4 times higher than the lowest, which was 14.2% (→ Figure 153). If you omit the highest and lowest values and compare the 25th with the 75th percentile, the result is a ratio of 1.5 in 2022 and 1.6 in 2000.

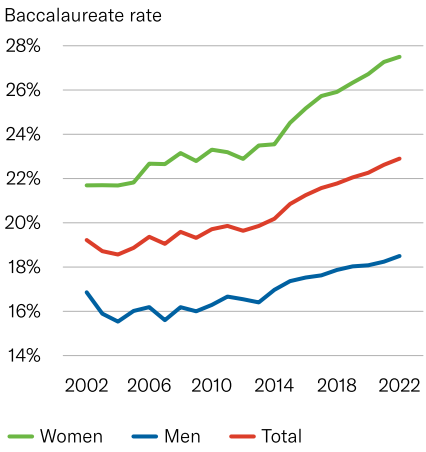
153 Cantonal baccalaureate rates, 2022 and 2000

Data: FSO



154 Baccalaureate rates by gender, 2002–2022

Data: FSO



Due to the changed survey method, there is a break in the time series in 2015.

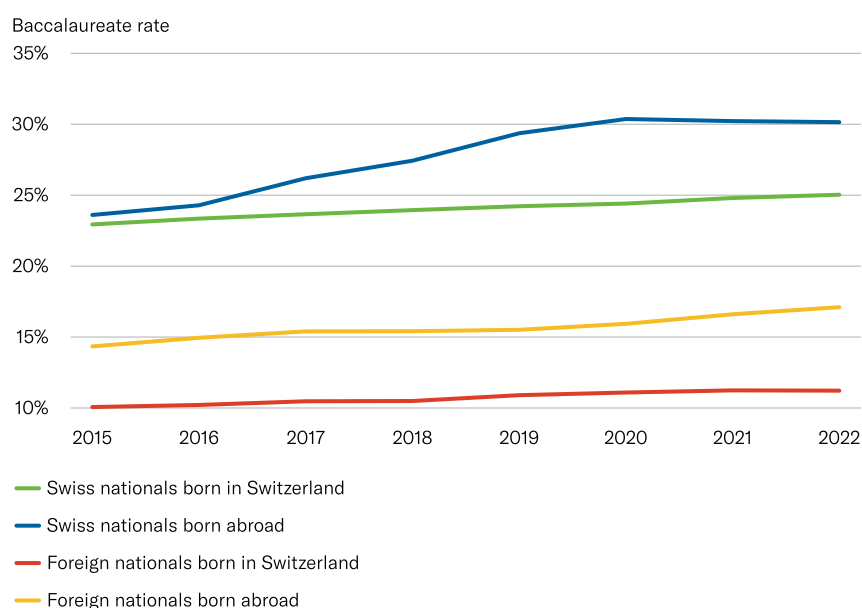
Migration and the continuing high popularity of baccalaureate schools amongst women are two explanatory factors for the increase in the baccalaureate rate over recent years. Between 2002 and 2022, the baccalaureate rate grew by 19%, at 27% for women and only 10% for men (→ Figure 154). Although the fact that women choose a baccalaureate more frequently than men is related to academic performance, but women are more likely to choose baccalaureate than men even with comparable performance (*Zumbühl & Wolter, 2017*). Preferences therefore play an important role in the choice of education and training.

Statistics on the baccalaureate rate by nationality will only be available from 2015. By 2022, the baccalaureate rate had increased by 19% for foreign nationals and 10% for Swiss nationals. The high growth in Swiss nationals born abroad is conspicuous (→ Figure 155). These figures are likely to include many naturalised baccalaureate pupils. Although Swiss-born foreign nationals have a significantly lower baccalaureate rate than Swiss nationals born in Switzerland based on differences in academic performance, their baccalaureate rate grew in a similar manner to that of their fellow Swiss

pupils. This can be explained by the fact that migrants – like women – are more likely to choose baccalaureate school with comparable performance (Gomensoro *et al.*, 2025; Tjaden & Scharenberg, 2017). However, preferences for baccalaureate school are particularly pronounced among migrants born abroad (Abrassart *et al.*, 2020).

155 Baccalaureate rates by nationality and place of birth, 2015–2022

Data: FSO

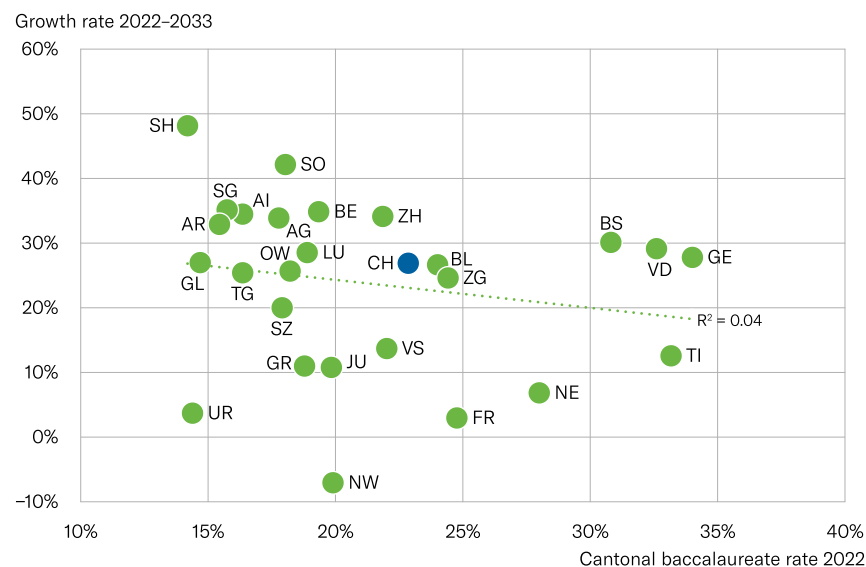


Development of baccalaureate qualifications

In its forecasts, the Federal Statistical Office (FSO) expects an increase in pupil numbers in all upper-secondary education programmes by 2033 (FSO, 2024p). However, the increase in general education is estimated to be particularly high. An increase of 17% in pupil numbers is expected in baccalaureate schools. If the expected change in baccalaureate qualifications in the cantons is examined, major differences can be identified (→ Figure 156). However, there is no clear correlation with the cantonal baccalaureate rate in 2022. High growth in baccalaureate qualifications can be observed in cantons with a low baccalaureate rate as well as those with a high baccalaureate rate. The same applies to low growth in baccalaureate qualifications. The cantonal differences can therefore probably be attributed to demographic differences.

156 Expected growth in cantonal baccalaureate qualifications 2022–2033 and baccalaureate rates 2022

Data: FSO; calculations: SCCRE



Digitalisation

Whereas manual activities used to be affected by automation, now cognitive activities are increasingly exposed to this risk as a result of digitalisation. This topic is therefore particularly relevant for baccalaureate school, which primarily prepares students for cognitive activities with the aim of obtaining a university entrance qualification. One study shows that persons with a tertiary education are least afraid of automation (*Cattaneo, Gschwendt et al., 2025*). Compared to persons who have completed upper-secondary education or even only compulsory education, they are less willing to sacrifice wages in order to reduce the risk of automation. Interestingly, however, the willingness to pay for a lower automation risk is higher among people whose jobs require a university education. This is in comparison to people in jobs that require basic vocational training. On the one hand, this can be explained by the fact that the investment costs in the form of time and salary foregone for university education are higher than for vocational education and training and that people therefore do not want to lose their desired profession through automation. On the other hand, the emergence of AI may also be a reason for this result, as it can replace specifically challenging cognitive activities.

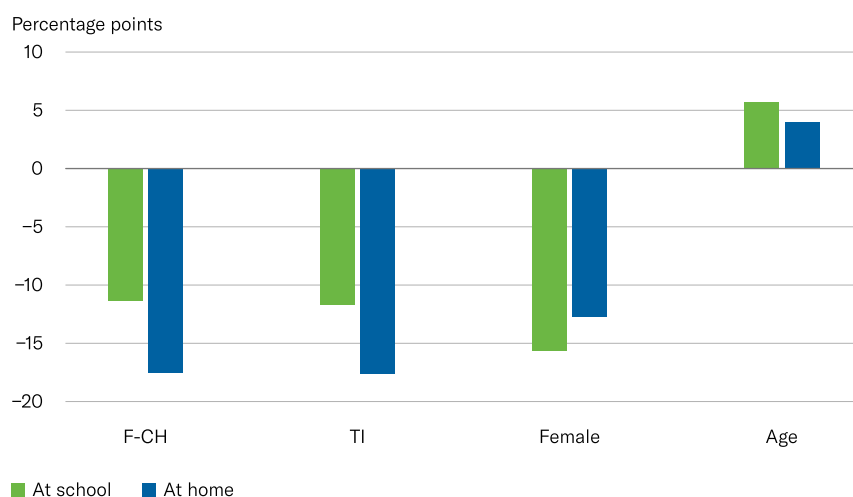
The new possibilities of either replacing cognitive activities with AI or improving cognitive performance using AI are also making themselves felt in general upper-secondary schools. According to the results of the fourth wave of surveys on digitalisation in the Swiss education system (*Oggenfuss & Wolter, 2024*), more than half of pupils used generative AI (such as ChatGPT) at least once a week in the classroom or at home for school tasks in 2024. Differences can be identified between the language regions. In French-speaking Switzerland and Ticino, the frequency of use was significantly lower than in German-speaking Switzerland (→ Figure 157), although, interestingly, the differences are less pronounced in use at school than in use for school purposes

at home. Women used generative AI less frequently than men, which may be attributable to two explanations that cannot be verified: On the one hand, women focus on other special subjects at baccalaureate school than men. The fact that the gender difference only exists in generative AI, but not in the use of AI-assisted translation programs, could indicate the correctness of this explanation. On the other hand, it is known from other studies that women are more likely to follow the instructions of their teachers in the classroom. If teachers communicate restrictions on the use of AI or prohibit it altogether, women may be more likely to follow these instructions.

157 Regular use of generative AI for school purposes

Estimated probabilities taking socioeconomic background and migration background into account; the difference to the reference category is shown (see text below chart); general education schools (baccalaureate schools and FMS) were taken into account

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



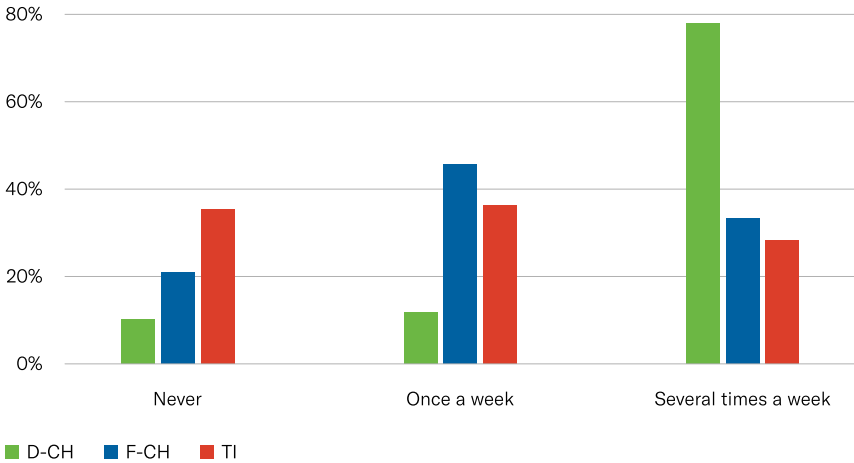
The reference categories are: German-speaking Switzerland (for French-speaking Switzerland and Ticino) and male (for female). Where age is concerned, the value indicated means the difference incurred for each additional year of age.

For AI to be used in schools, digital aids such as computers, tablets or smartphones are required. In baccalaureate schools, the “bring your own device” (BYOD) approach, in other words, the use of your own device for school use, is often established. Although, according to a survey conducted in 2022, not all baccalaureate schools have adopted a corresponding concept (*ZEM CES, 2022b*), but this is more common in German-speaking Switzerland than in Latin-speaking Switzerland. With the spread of the BYOD concept in baccalaureate schools in German-speaking Switzerland, the use of own devices for school purposes has also increased in parallel (*Oggenfuss & Wolter, 2024*) (→ Figure 158). According to one study, the use of own devices in class is linked to 21st century skills (*Schmitz et al., 2024*). These include the skills of creativity, communication, collaboration and critical thinking. Pupils who work with their own devices in class have higher scores in the above-mentioned skills than those who do not use them.

158 Use of own device at school

Estimated probabilities taking into account gender, age, socioeconomic background and migration background; general education schools (baccalaureate schools and upper-secondary specialised schools) were taken into account

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



Institutions

Individuals with a Swiss baccalaureate are free to choose a tier-one university or university of teacher education. In addition, the baccalaureate provides exam-free access to almost all study programmes – with just a few exceptions (such as medicine and sport). This distinguishes Switzerland from most other countries where access to higher education institutions and subjects is regulated by the higher education institutions. Switzerland also differs from other countries with regard to another issue. There are no nationally standardised baccalaureate examinations in Switzerland. Although it is possible to take the Swiss baccalaureate examination, the majority of baccalaureate students obtain a cantonal baccalaureate. These baccalaureate certificates are recognised by the federal government, which means that the requirements of the new 2023 Regulation on the Recognition of the Baccalaureate (MAR 23 Regulation) must be met. Nevertheless, cantons, schools and/or teaching staff have a high degree of autonomy with regard to the education programme.

Further development of the baccalaureate

As part of the “Further development of the baccalaureate” project (WEGM), the Ordinance on Recognition of Baccalaureates (MAV) and the Regulation on the Recognition of the Baccalaureate (MAR) of 1995 as well as the framework curriculum for baccalaureate schools of 1994 were revised. The first two were adopted in 2023, the framework curriculum in 2024. The background was the joint education policy objective of the federal government and the cantons to ensure examination-free access to tier-one universities with a baccalaureate in the long term. The main changes under the reform are as follows:

1. Baccalaureate education must now last at least four years (Art. 7 MAR 23). In the past, a three-year course was possible if a previous baccalaureate school education had taken place at lower-secondary level (Art. 6 para. 2 MAR 95). This applies to the cantons of Jura, Neuchâtel, Vaud and the French-speaking part of the canton of Bern; these must adapt the existing system.
2. Economics and law as well as computer science become regular subjects. This means that they now also count towards the baccalaureate grade and not, as previously, only towards the semester or annual grade.
3. There is no longer a defined list of subjects for special subjects and supplementary subjects (cf. Art. 9 para. 3 and 4 MAR 95). Instead, special subjects from the core area can be selected and combined (Art. 12 and 13 MAR 23). For example, it would thus be possible to combine history and French into one special subject. The cantons have a high degree of autonomy in this regard. According to Art. 14, they can offer additional subjects as special or supplementary subjects.
4. MAR now stipulates that pupils should acquire basic subject-specific study skills in mathematics and the language of instruction (Art. 19 MAR 23). The new framework curriculum contains specific minimum requirements for this. A report (*ZEM CES, 2025*) shows that significant steps have already been taken towards implementation in the cantons and baccalaureate schools, but these have not yet been completed. The core curriculum also states that transversal skills should be taught (Art. 20 MAR 23). The transversal area consists of general skills (methodological, self-related, social and communicative skills), interdisciplinary work as well as the subject areas of education for sustainable development, civic education and digitalisation. These topics should be taught in every subject. It is also intended to ensure that every pupil takes part in an exchange or mobility activity in another language region or abroad (Art. 22 MAR 23).

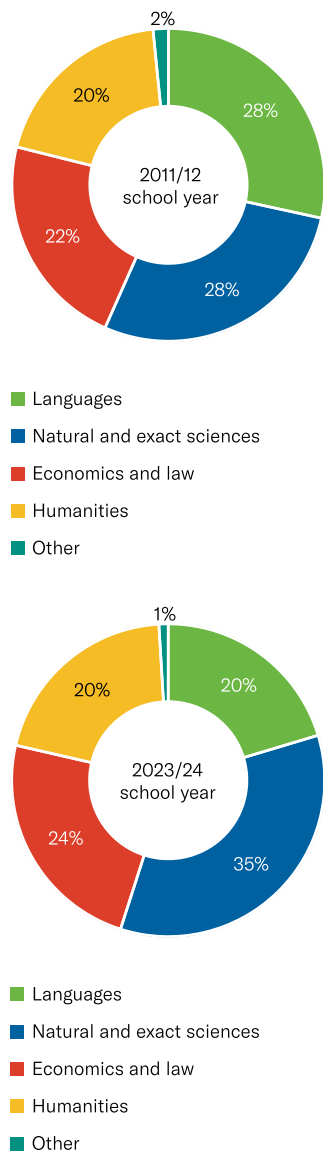
Subjects offered and time allocations

As part of the project “Further development of the baccalaureate”, the number of regular subjects was increased from eleven to thirteen. In addition to this, there are the special and supplementary subjects. The regular subjects include the language of instruction, a second national language, a third language (a third national language, English or a classical language), mathematics, biology, chemistry, physics, history, geography, visual arts, music, economics and law, and computer science. The cantons also have the option of offering philosophy as an additional regular subject.

At the end of baccalaureate schooling, all baccalaureate students write a baccalaureate paper and sit the baccalaureate examination, which examines the following subjects: the language of instruction, a second national language, mathematics, the special subject and a further subject specified by the canton (Art. 24, MAR 23 Regulation). The minimum share of the regular subjects in the total teaching time is 27 % each for the language subjects as well as for mathematics and natural sciences, 12 % for the humanities and social sciences and 6 % for the artistic subjects (Art. 18 MAR 23). At least 15 % of the time should be allocated to the special and supplementary

159 Shares of special subjects compared over time

Data: FSO



Languages: classical and modern languages

Natural and exact sciences: Physics and applications of mathematics; biology and chemistry

Humanities: Philosophy, pedagogy, psychology; music; visual arts (formerly fine arts)

Other: baccalaureate not recognised at federal level or special subject unknown

subjects as well as to the baccalaureate paper. A comparison of the shares of special subjects between the 2011/12 and 2023/24 school years reveals that the natural sciences have become more popular (→ Figure 159). This was at the expense of linguistic subjects.

Admission requirements and time of transition

The admission conditions and the time of transition to a baccalaureate school differ considerably from one canton to another (→ Figure 160). Grades are used by most cantons as a criterion for regulating admission to baccalaureate school. In some cantons, they are the only criterion relevant for transition to baccalaureate school. In other cantons, an entrance examination is used as a selection tool in addition to grades, and in three cantons, admission to a baccalaureate school is only possible via an entrance examination. In a quarter of the cantons, the recommendation of the teacher at the teaching level is taken into account in the transition decision. The recommendation takes into account factors such as social skills, motivation, commitment and discussions with parents. There are also differences between the cantons when it comes to the duration of baccalaureate schooling and the timing of the transition. A distinction is made between the long-term baccalaureate cycle, which lasts six years, and the short-term baccalaureate cycle, which lasts four years. Admission to the long-term baccalaureate cycle takes place immediately after primary school, in other words, after the 8th school year (according to the HarmoS count). In the case of the short-term baccalaureate cycle, admission takes place during or after completion of lower-secondary education. In some cantons, a transition is already possible after the 10th school year.¹ The option of not entering baccalaureate school until after the end of compulsory education, in other words, after the 11th school year, however, exists in all cantons. The long-term baccalaureate cycle is only offered in the German-speaking cantons of Appenzell Innerrhoden, Glarus, Grisons, Lucerne, Nidwalden, Obwalden, St. Gallen, Uri, Zug and Zurich, while the other cantons only offer the short baccalaureate cycle.

Continuing education for baccalaureate school teachers

In three waves (2021, 2022, 2023) the Swiss Centre for Secondary Schools and for School Evaluations at Upper-Secondary Level (ZEM CES) surveyed teachers and school personnel in all baccalaureate subjects for continuing education and training opportunities and the framework conditions for continuing education and training (CET) (ZEM CES, 2021, 2022c, 2023). The results showed that in 14 out of 20 subjects, more than 50% of teachers stated that there were not enough continuing education and training opportunities to meet their needs. Across all subjects, 47% of teachers shared this view. In French (as a first language), music and philosophy, as well as pedagogy and psychology, more than two-thirds of those surveyed responded accordingly. In the subjects German (as a first language), economics and law, as well as sport, more than two-thirds of the respondents rated the offer as

¹ The cantons of Appenzell Innerrhoden and Uri also offer the option of transferring after the 9th school year.

adequate. The lack of a suitable offer was also the second most common reason for respondents not to complete continuing education and training. The most common reason given why the respondents did not take part in continuing education and training was their overall workload, while the third reason was organisational effort. The majority of continuing education and training courses attended were rated as being of good to very good quality. This was particularly true of continuing education and training offered by professional associations, universities/ETH or private individuals. Slightly lower was satisfaction with internal continuing education and training and courses offered by universities of applied sciences as well as universities of teacher education. A large proportion of teachers rated the impact of continuing education and training attended on job satisfaction and the quality of teaching as high to very high. ZEM CES will continue the survey every four years. The next continuing education and training barometer (2027) will focus on the CET needs expected with the new core curriculum.

Bilingual teaching

Data on bilingual teaching (immersion classes) at school level is not currently available for Switzerland. However, there are figures on which baccalaureate schools offer immersion classes. Regarding these, there was a significant increase in supply between 2018 and 2024 (→ Figure 161). As the number of baccalaureate schools has not changed significantly (157 in 2018 compared with 161 in 2024), this means that it is predominantly the existing baccalaureate schools that have introduced bilingual courses. It is also conspicuous that there are more offers in the national languages, which have overtaken the offer in English. A particularly sharp increase can be observed in the immersion language Italian. This could be a consequence of the recommendations of the Swiss Conference of Cantonal Ministers of Education (EDK) on the promotion of Italian at baccalaureate schools (EDK, 2015, 2022).

Internationally, a number of studies exist which investigate the relationship between bilingual teaching and skills in the respective language. However, the impact of bilingual teaching is difficult to assess due to self-selection in the individual courses (Ohlberger & Wegner, 2018). A study from Germany (Rumlich, 2018) attempts to paint a more balanced picture by not only comparing the language skills of pupils in bilingual classes with the other classes within the same schools, as in many other studies, but also by taking into account the language skills of non-bilingual classes from other schools. It became clear that the pupils in bilingual classes had significantly higher language skills than their colleagues in the two comparison groups. However, the problem of selection effects remains, which means that the results can only be interpreted to a limited extent. There are no studies on this topic at baccalaureate level in Switzerland. A study investigating bilingual teaching in German and French in the city of Biel examined the first four years of compulsory education (including pre-school) (Buser & Melfi, 2022). This study also reports on the positive effects of bilingual teaching. The study was able to confirm methodically that the language skills of pupils attending bilingual lessons was a priori comparable to that of pupils attending monolingual lessons. Some other studies on bilingual teaching have the problem of minimum requirements for admission to bilingual courses, which makes it difficult to compare the skills of bilingual and non-bilingual pupils.

160 Admission conditions and dates of transition

Years of education according to the HarmoS count

Data: EDK-IDES (2024g)

Cantons	Admission requirements			Transition after		
	Entrance examination	Grades	Recommendation Teacher	8 th education year	10 th education year	11 th education year
AG	Yes	Yes	Yes	Yes	Yes	Yes
AI	Yes	Yes	Yes	Yes	Yes	Yes
AR	Yes	Yes	Yes	Yes	Yes	Yes
BE-d	Yes	Yes	Yes	Yes	Yes	Yes
BE-f	Yes	Yes	Yes	Yes	Yes	Yes
BL	Yes	Yes	Yes	Yes	Yes	Yes
BS	Yes	Yes	Yes	Yes	Yes	Yes
FR	Yes	Yes	Yes	Yes	Yes	Yes
GE	Yes	Yes	Yes	Yes	Yes	Yes
GL	Yes	Yes	Yes	Yes	Yes	Yes
GR	Yes	Yes	Yes	Yes	Yes	Yes
JU	Yes	Yes	Yes	Yes	Yes	Yes
LU	Yes	Yes	Yes	Yes	Yes	Yes
NE	Yes	Yes	Yes	Yes	Yes	Yes
NW	Yes	Yes	Yes	Yes	Yes	Yes
OW	Yes	Yes	Yes	Yes	Yes	Yes
SG	Yes	Yes	Yes	Yes	Yes	Yes
SH	Yes	Yes	Yes	Yes	Yes	Yes
SO	Yes	Yes	Yes	Yes	Yes	Yes
SZ	Yes	Yes	Yes	Yes	Yes	Yes
TG	Yes	Yes	Yes	Yes	Yes	Yes
TI	Yes	Yes	Yes	Yes	Yes	Yes
UR	Yes	Yes	Yes	Yes	Yes	Yes
VD	Yes	Yes	Yes	Yes	Yes	Yes
VS	Yes	Yes	Yes	Yes	Yes	Yes
ZG	Yes	Yes	Yes	Yes	Yes	Yes
ZH	Yes	Yes	Yes	Yes	Yes	Yes

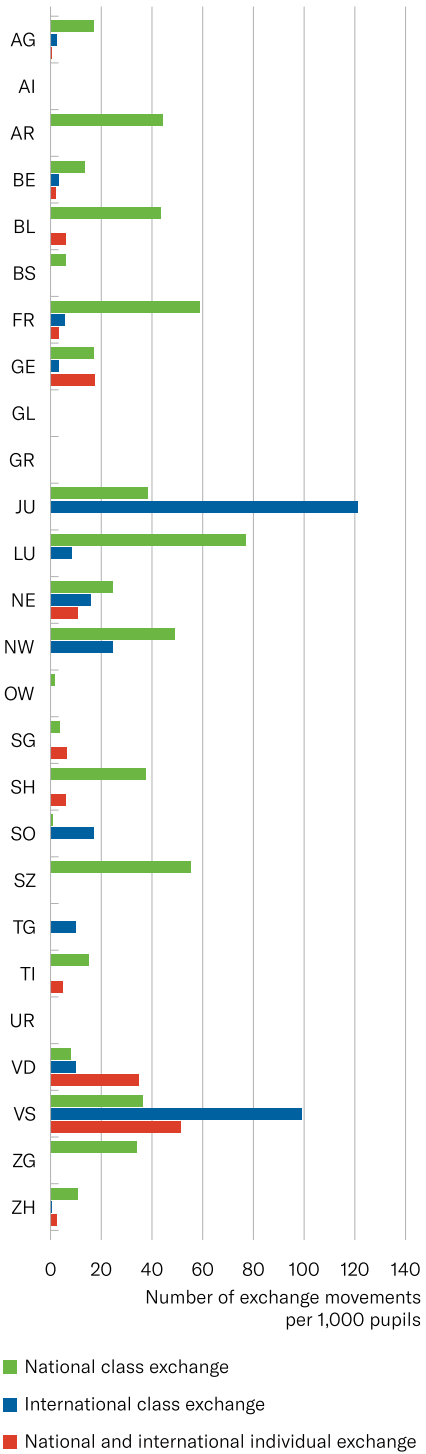
■ Yes

■ No

162 Mobility in the cantons

Average number of exchange movements per 1,000 pupils in 2023 and 2024

Data: Movetia; calculations: SCCRE

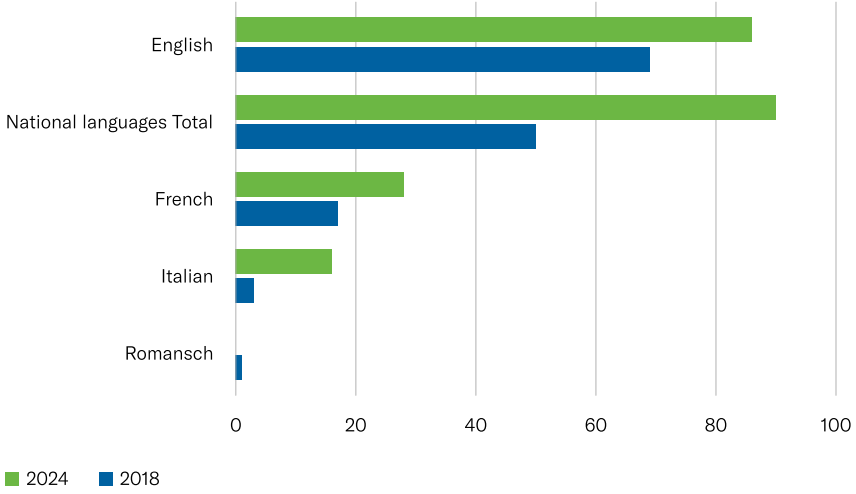


Individual exchanges and international class exchanges do not statistically differentiate between baccalaureate school and upper-secondary specialised schools. However, the national class exchanges only contain data from the baccalaureate schools.

161 Bilingual teaching offer at baccalaureate schools, 2018 and 2024

Number of baccalaureate schools offering the respective courses

Data: SERI



Baccalaureate schools: all schools whose baccalaureate certificates are recognised in accordance with MAR/MAV (including baccalaureate schools for adults and private schools)

Exchange and mobility

In accordance with the eighth education policy objective of the federal government and the cantons, exchange and mobility are to be promoted at all levels of education (*EAER & EDK, 2023*). Movetia, the national agency for exchange and mobility, collects annual figures on the exchange movements they support. These figures show that exchange and mobility are not equally widespread in all cantons (→ Figure 162). National class exchanges are the most common in all cantons. The data records the number of exchange movements. As classes or individual pupils can take part more than once, the number of persons involved cannot be derived from this data. Furthermore, the data presented here only reflects the exchange movements promoted by Movetia and is thus incomplete. For these two reasons, the objective of an exchange movement per pupil during baccalaureate school as set out in the Regulation on the Recognition of the Baccalaureate (Art. 22 MAR 23) cannot be verified using this data.

Keeping teachers in the profession

In connection with the shortage of teachers, the subject of how potential teachers can be recruited for the profession is frequently discussed. However, it is just as important that teachers stay in their profession over a longer period of time and do not resign after a short period of time. Looking at how long teachers remain in general education at upper-secondary level over a period of nine years, it can be seen that the probability of retention during this period falls by 11 percentage points. In the first three years, women are less likely to remain than men (→ Figure 163). Given that the persons analysed at that time were between 30 and 40 years old, this

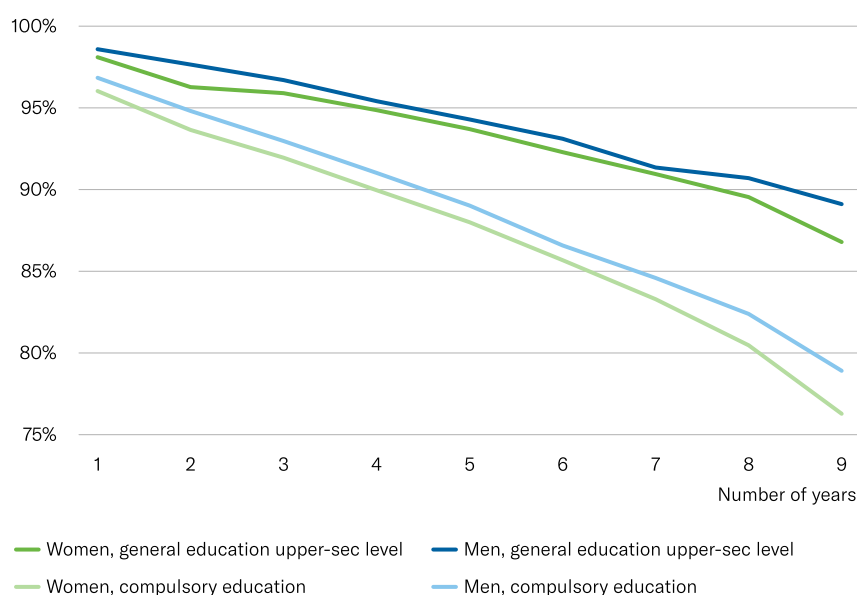
discrepancy could be explained by the fact that women in this age range are more likely to give up their profession due to starting a family than are men. At the end of the observed period, there is another gender discrepancy, but the reason for this discrepancy is unclear.

It can also be seen that the probability of teachers remaining in general education at upper-secondary level is higher than that of teachers in compulsory education over the period studied. In addition, the likelihood of teachers remaining in general education decreases less sharply than in compulsory education. While the former decreases by 11%, the latter decreases by 20%. On the one hand, the higher probability of teachers remaining in general education can be explained by the fact that the teachers in this professional group have invested more time in their education. This can lead to higher losses in specific human resources when changing careers. On the other hand, wages in general education are also higher than in compulsory education. It may therefore be more difficult for a teacher in general education to find a job with a comparable salary than it is for a teacher in compulsory education. However, the differences in retention rates cannot be explained by the higher proportion of women in compulsory education, as the retention rates of men and women differ to the same extent between general education and compulsory education.

163 Probability of teachers remaining in the profession, general education (upper-secondary level) and compulsory education

Persons who were aged between 30 and 40 years old at the beginning of the observed time period (in 2012) were taken into account.

Data: FSO (SSP); calculations: SCCRE



Effectiveness

Baccalaureate pupils should acquire the skills they need for studies at higher education institutions and which enable them to take on challenging tasks in society (Art. 6 MAR 23). The two educational objectives of the general ability to study and an in-depth social maturity are derived from this. The ability to study is achieved based on the basic subject-specific study skills, for which the core curriculum now sets specific minimum requirements. In order to achieve the goal of in-depth social maturity, transversal areas have been included in the core curriculum. There is no precise definition for this objective, which is why it is difficult to verify based on empirical values. The subchapter Effectiveness therefore focuses primarily on assessing the objective of the ability to study. Ability to study means having the necessary abilities to start a course of study. To this end, students must first graduate from baccalaureate school. Although this attests to the fact that students are able to study, this can only be verified years after they have graduated from baccalaureate school (→ *chapter Universities, page 211*). A new study shows once again that the graduation rate differs according to cantonal baccalaureate rate and special subject (*Eberle, 2025*). It should also be borne in mind that baccalaureate students with a low grade average are more likely to fail to pursue a course of study even though their ability to study was attested to by their successful graduation from baccalaureate school. This makes it difficult to answer the question of whether a baccalaureate certificate actually attests to the ability to study in all cases.

Cantonal baccalaureate admission and graduation rates

As already mentioned, the majority of baccalaureate students obtain a baccalaureate that is recognised on a federal basis but defined by the canton. A comparison of the skills of successful baccalaureate students between the cantons, which would be important for assessing the effectiveness of a baccalaureate school, is therefore not possible without a standardised assessment. This was conducted only once via the EVAMAR II evaluation (*Eberle et al., 2008*). The only option of a cantonal comparison is to compare skills on admission to baccalaureate schools. These entry requirements, in turn, are of only limited relevance when comparing the ability to study when graduating from baccalaureate school, as the 2023 Education Report showed that the cantons make varying degrees of selection at baccalaureate school and it must be assumed that the skills are promoted equally during baccalaureate schooling, irrespective of the entry requirements.

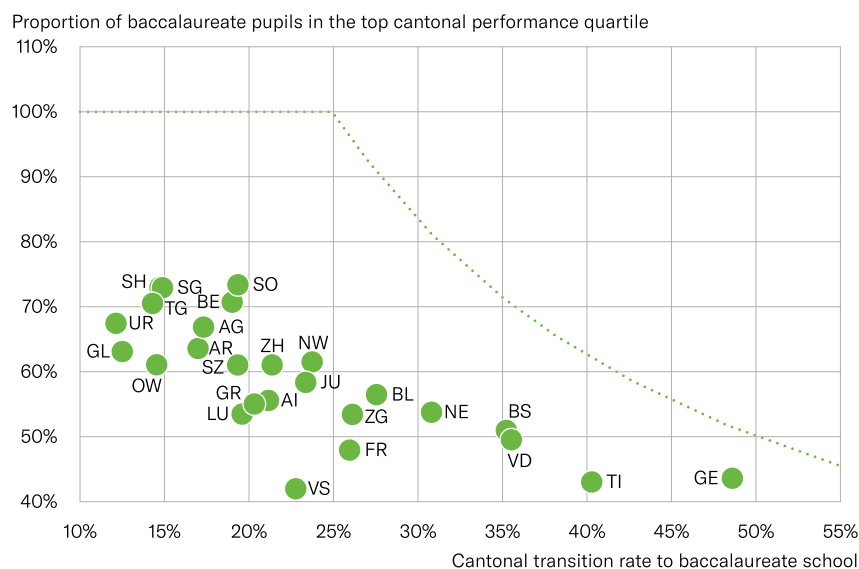
However, due to the high academic requirements of baccalaureate schools, it is to be expected that in every canton those pupils who have shown the highest academic performance will transfer to baccalaureate school. However, the data from the review of the national education objectives (ÜGK) 2016, which tests mathematical skills, shows that not all baccalaureate pupils are in the top performance quartile (→ *Figure 164*).

The fact that the cantons exploit their performance potential to varying degrees is one reason why the shares of baccalaureate pupils in the top performance quartile differ from canton to canton. The second explanation for the cantonal differences is that the shares of pupils entering baccalaureate school after completing compulsory education differ between

the cantons. If the transition rate to baccalaureate school is more than 25%, this means that the maximum possible share in the top performance quartile can no longer be 100%. The more the baccalaureate rate exceeds the 25% threshold, the lower the maximum possible share of baccalaureate pupils whose performance may be in the top quartile.

164 Share of baccalaureate pupils in the top cantonal performance quartile in mathematics

Data: FSO (LABB), EDK (ÜGK 2016); calculations: SCCRE



Reading example

The green dotted line indicates the maximum possible share of baccalaureate pupils who may be in the top performance quartile, depending on the transition rate to baccalaureate school. A maximum share of 100% is only possible if the cantonal transition rate to baccalaureate school does not exceed 25%. The derivation of the maximum possible share in the top performance quartile for a transition rate of more than 25% is explained using the example of the canton of ZG: The transition rate by canton of residence is 26.1%, of which only 25 percentage points can lie in the top performance quartile. If this is divided by the transition rate of 26.1 percentage points, this results in a maximum possible share of 95.7%. It is also evident that the canton of GE has one of the lowest proportions of baccalaureate pupils in the top cantonal performance quartile. However, this is due to the fact that it has the highest transition rate to baccalaureate school. The canton of GE is at the top in terms of utilising the talent pool of the best performing quartile.

Less capable persons entering baccalaureate school complete it less often than high-performing baccalaureate pupils (→ Figure 165). The differences between the graduation rate of those who were among the top 25% in the review of the national education objectives (ÜGK) and the remaining 75% also differ from canton to canton. In cantons with high graduation rates, relatively few pupils transition to baccalaureate school. It is therefore to be expected that the graduation rates of the two groups in these cantons will be closer together, as even those not included in the top quartile of mathematical skills were close to the performance of the top performers. A high transition rate to baccalaureate school, on the other hand, increases the probability that pupils with comparatively poor academic performance will also be accepted. This is one possible explanation of the fact that in cantons with high transition rates, the graduation rates differ more strongly between the top quartile and the other pupils.

Reading example

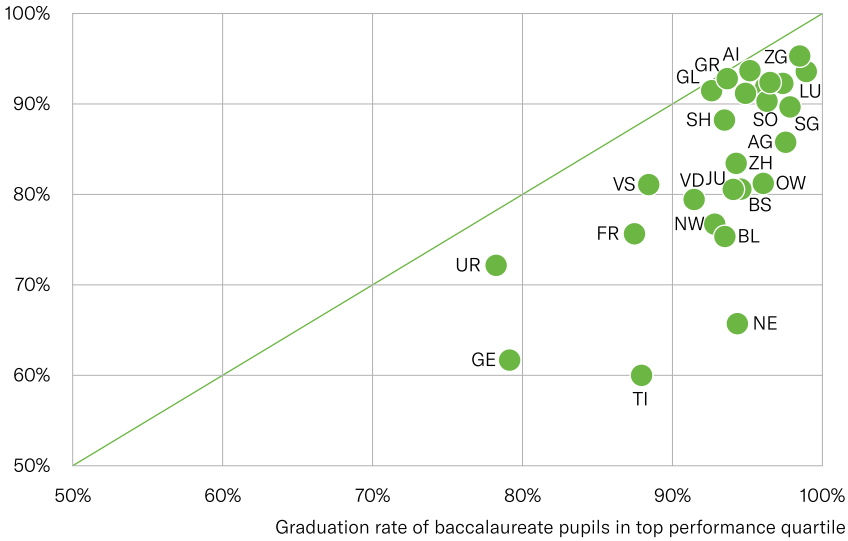
In the canton of UR, baccalaureate pupils in the top performance quartile have a graduation rate of 78.2%. The graduation rate for the remaining 75% is 72.2%. The green line shows the values for which the graduation rate of both groups is equally high.

165 Baccalaureate graduation rates

Baccalaureate pupils in top performance quartile in mathematics as well as other 75%

Data: FSO (LABB), EDK (ÜGK 2016); calculations: SCCRE

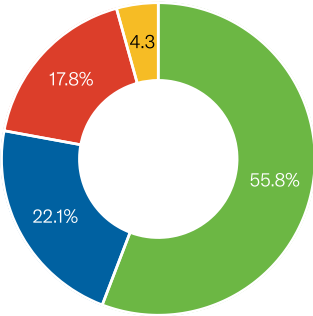
Graduation rate of other baccalaureate pupils



166 Times of drop-outs in baccalaureate school

As a percentage of all drop-outs

Data: FSO (LABB); calculations: SCCRE



- In the 1st year
- In the 2nd year
- In the 3rd, 4th or 5th year
- Failing the exam

A few people have been in baccalaureate school for more than five years. These were not taken into account in these analyses.

Drop-out rates

10% of pupils in a cohort that enters baccalaureate school do not graduate from it. The drop-out rate is 9% for female pupils and 11.5% for male pupils. More than half of these drop-outs take place in the first year (→ Figure 166). Around one-fifth drops out of baccalaureate school in the second year and just under a second fifth only after three or more years. The share of students who fail baccalaureate school as a result of failing the baccalaureate examination is only 4.3%.

In order to achieve the 95% target – according to which 95% of all 25-year-olds should have at least one qualification at upper-secondary level – it is also important for young people who drop out of baccalaureate school to be able to complete a qualification in another type of upper-secondary education. Changing from a baccalaureate to an upper-secondary specialised school is relatively easy, as it involves a change within the general education system. In addition, it is sometimes even possible to switch from baccalaureate to upper-secondary specialised school without having to repeat the corresponding year of education at the upper-secondary specialised school. However, a reorientation to vocational education and training is more difficult. While it is possible for people with a baccalaureate certificate to have their achievements at baccalaureate credited, there are currently no comparable programmes for baccalaureate pupils without a baccalaureate certificate (*Aeschlimann & Schweri, 2024*).

Efficiency/costs

It is difficult to assess the efficiency of the baccalaureate school, as there is no output measurement at the end of baccalaureate education in the form of comparable competence measurements throughout Switzerland. For this reason, drop-outs and repetitions are used as an alternative. Although these key figures allow a statement to be made on the success of pupils at baccalaureate school and thus on efficiency, this is less precise than a statement based on performance data.

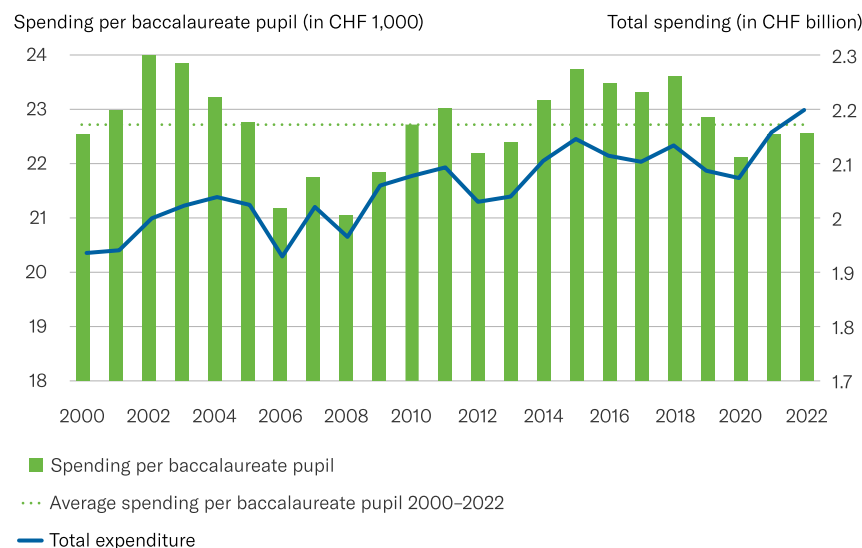
Educational spending

A look at real spending on education over the past 20 or so years shows an increase in total spending by 14%. The growth in education spending is attributable solely to the increase in pupil numbers, as expenditure per baccalaureate pupil is almost identical at just under CHF 23,000 in 2000, 2022 and on average over the entire period, despite strong fluctuations in some cases during the period (→ Figure 167).

167 Annual education spending per baccalaureate pupil and total, 2000–2022

Real public spending on education at baccalaureate schools (including pupils in progymnasial classes)

Data: FSO, FFA; calculations: SCCRE



Repetitions and drop-outs

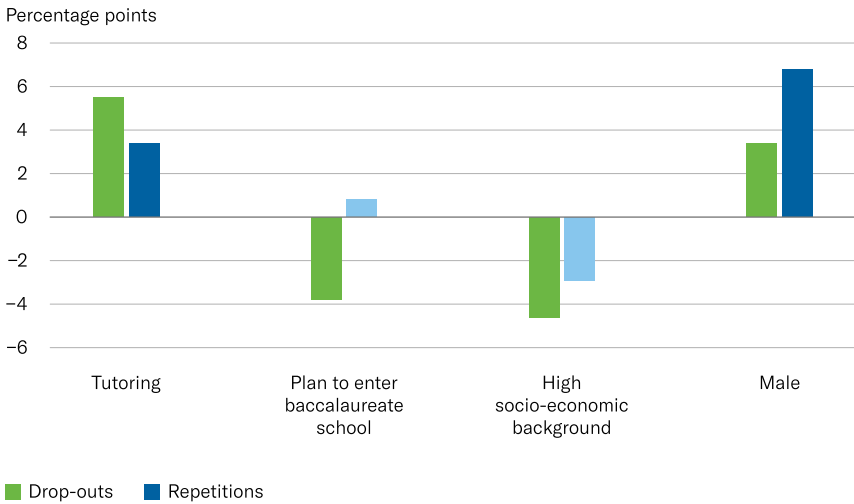
As already mentioned, every tenth person who enters baccalaureate school drops out. Just under a third of these persons have repeated a year before. Repetitions occur in 11% of pupils during the course of their baccalaureate schooling, of whom almost three quarters still manage to complete baccalaureate school successfully. Various factors are relevant for drop-outs

and repetitions at baccalaureate school. On the one hand, these are cognitive skills. If a pupil graduated in mathematics in the lowest performance quintile in the 2016 ÜGK survey, the probability of dropping out for other relevant factors is 15%. If the ÜGK performance is in the top quintile, the probability of a drop-out is 7% and is therefore not even half as high as for persons in the bottom quintile. The finding that was determined based on the PISA data can also be confirmed (*Zumbühl et al., 2025*): Pupils who have taken paid extracurricular tutoring prior to admission to baccalaureate school have a higher risk of dropping out or repeating baccalaureate school than persons without tutoring. This is the case even with comparable cognitive skills (→ Figure 168). Other influencing factors include socioeconomic background, gender and non-cognitive skills. The latter include skills such as perseverance or the ability to plan. Persons who planned to attend baccalaureate school in the ÜGK survey are less likely to drop out than pupils who did not follow this plan. There was no significant difference in the repetitions. Socioeconomic background and gender are also relevant factors, whereby the former has no statistically significant effect on repetitions. There is no clear correlation between the migration background and the risk of dropping out or the probability of having to repeat a year.

168 Repetitions and drop-outs at baccalaureate school, individual factors

Estimated probabilities, taking cognitive skills and other control variables into account, showing the difference from the reference category (no extracurricular tutoring; no plan to enter baccalaureate school; low socioeconomic background; female)

Data: FSO (LABB), EDK (ÜGK 2016); calculations: SCCRE



Light blue colours show statistically insignificant effects (5% significance level).

Reading example

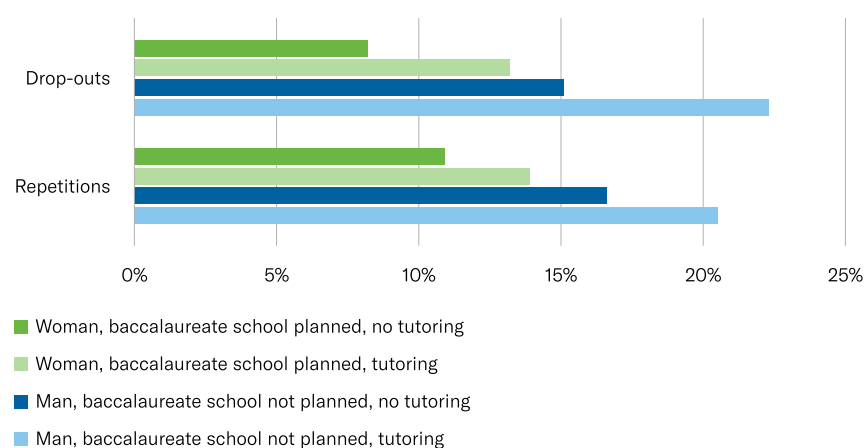
If paid extracurricular tutoring was taken prior to admission to baccalaureate school, the probability of dropping out of baccalaureate is 5.5 percentage points higher than if this was not the case.

In reality, the effects mentioned do not occur in isolation, but always jointly. It is therefore worth considering them for different combinations of the aforementioned factors. For example, if a man had not planned to enter baccalaureate school but had taken tutoring prior to admission, he would have an almost three times higher risk of dropping out of baccalaureate school than a woman who had not taken tutoring but had planned to switch to baccalaureate school. Compared to this young woman, the young man would also be twice as likely to repeat a year of baccalaureate school (→ Figure 169). In fact, however, men are somewhat less likely to require tutoring in order to make the transition to baccalaureate school, which reduces the gender-specific differences somewhat on average.

169 Baccalaureate school drop-outs and repetitions, combined factors

Estimated probabilities taking into account cognitive skills, socioeconomic background and other control variables

Data: FSO (LABB), EDK (ÜGK 2016); calculations: SCCRE



Equity

The topic of “Equity” examines the questions of whether and to what extent factors that cannot be influenced by the pupils influence the educational path. In other words, it is a question of whether the educational path depends solely on individual performance or also on other factors, such as gender, family background or institutional conditions. It is somewhat more difficult to assess the impact of preferences, as although these may certainly differ from one individual to another, they may also depend to some extent on factors of origin or social values and ideas. In Switzerland, there are definite indications that preferences for baccalaureate school differ according to language region, gender or socioeconomic background (*Cattaneo & Wolter, 2022*). The impact of grading at lower-secondary level on admission to baccalaureate school, the choice of special subjects and the differences between long-term and short-term baccalaureate schools is discussed specifically below. The influence of gender or socioeconomic background on drop-outs and repetitions was discussed in the subchapter Efficiency.

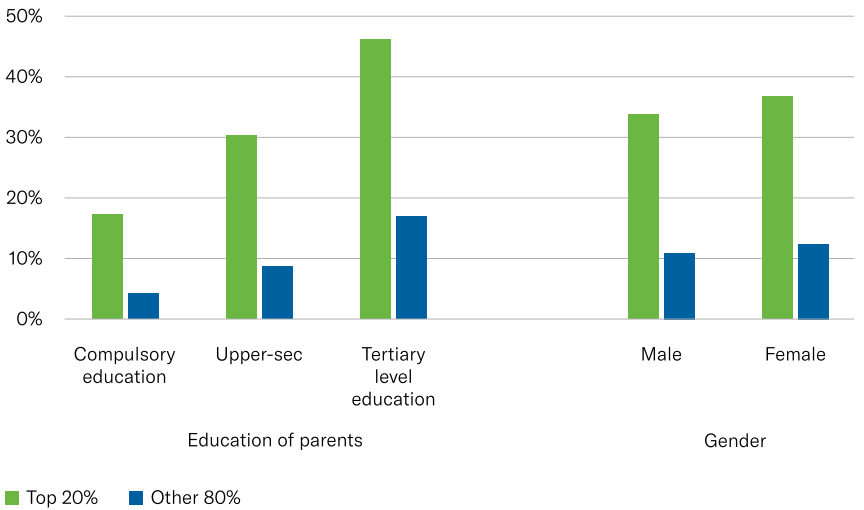
Admission to long-term baccalaureate school

When analysing the influence of socioeconomic background on educational decisions and successes, the timing of selection is often a matter of debate. It is assumed that the earlier the selection takes place, the more it could be influenced by the socioeconomic background (*Reardon, 2013*). When analysing the social selectivity of baccalaureate schools, it is therefore important to bear in mind that in some cantons the majority of pupils who make it to baccalaureate school are selected after the end of primary school; this is always the case if the canton has long-term baccalaureate schools. If we analyse the probabilities of transitioning to long-term and short-term baccalaureate school by gender and socioeconomic origin using the data from the 2017 ÜGK survey, in which language performance in the 8th school year was tested (at the end of primary level), the results show the following: The probability of entering a long-term baccalaureate school is strongly linked to the parents' educational background (→ Figure 170). The better educated the parents are, the higher the probability of a transition. This applies both to the pupils in the top performance quintile as well as to the remaining 80%. The differences are so pronounced that pupils whose parents only have a compulsory school-leaving qualification but are in the top performance quintile are not more likely to transition to a long-term baccalaureate school than children of parents with academic qualifications who are not in the top 20% of the canton. If children of parents with a low level of education are among the top 20%, the probability of entering baccalaureate school is four times higher than that of children from the remaining 80% and the same level of education as their parents. For children with parents who have a tertiary qualification, this ratio is only 2.7. In terms of gender, it is shown that girls enter long-term baccalaureate school only slightly more often than boys. This is in contrast to short-term baccalaureate schools, where boys are more underrepresented.

170 Probability of transition to long-term baccalaureate school

Taking cognitive skills into account (ÜGK performance in the school language and in the first foreign language) and other control variables

Data: FSO (LABB), EDK (ÜGK 2017); calculations: SCCRE



Transition to baccalaureate school and parents' educational background

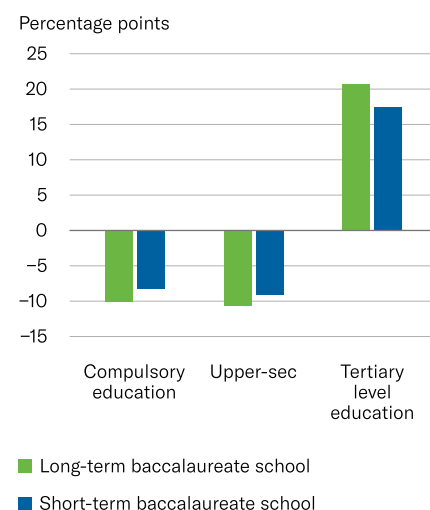
Looking at the distributions of pupils in the cantons with long-term baccalaureate schools according to their parents' educational background without taking their performance at primary level into account, 58% of those who transitioned to a long-term baccalaureate school have parents with a tertiary qualification; only 5% of these young people have parents who only have a compulsory school qualification. Of those transitioning to a short-term baccalaureate school, 54% have parents with tertiary education and 7% have parents with a compulsory school qualification. The over-representation of children whose parents have a tertiary qualification does not decrease noticeably when they transfer to short-term baccalaureate school. That the majority of children whose parents have tertiary education had already transitioned to long-term baccalaureate school earlier is therefore not the case. In cantons with long-term baccalaureate schools, transitions to both types of baccalaureate school remain the same in terms of social selectivity (→ Figure 171).

Comparing the transition to a baccalaureate school between cantons with and without a long-term baccalaureate school shows that pupils whose parents have a compulsory educational background have a better chance of transitioning to a baccalaureate school in a canton without a long-term baccalaureate school than in cantons with a long-term baccalaureate school (→ Figure 172). This difference is statistically significant even taking into account individual performance as well as various characteristics of the composition of the population and the cantonal baccalaureate rate (→ Figure 173). The transition probabilities of children whose parents have a tertiary education – compared to children whose parents have an upper-secondary education – do not statistically differ significantly between cantons with and without a long-term baccalaureate school. However, the difference in the transition probability between children whose parents have the lowest and the highest level of education is significantly greater in cantons with long-term baccalaureate schools than in those with only short-term baccalaureate schools. In cantons with long-term baccalaureate schools, the transition is therefore more socially selective.

171 Shares of parents' qualifications in long-term or short-term baccalaureate school

In cantons with a long-term baccalaureate school; difference from share of persons of the same age reference population

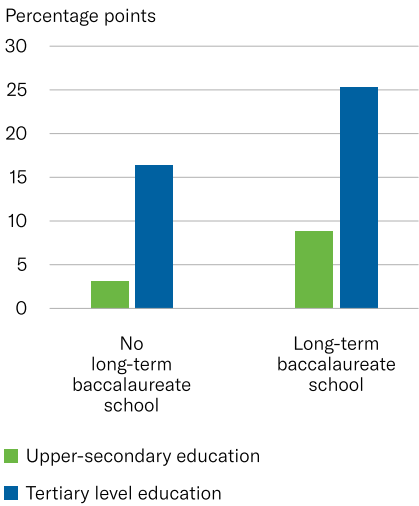
Data: FSO (LABB), EDK (ÜGK 2017); calculations: SCCRE



173 Probability of transition to baccalaureate school

Taking cognitive skills (ÜGK performance in the school language and first foreign language) and other control variables into account, the difference from the reference category (pupils with their parents' compulsory school leaving certificate) is shown

Data: FSO (LABB), EDK (ÜGK 2017); calculations: SCCRE



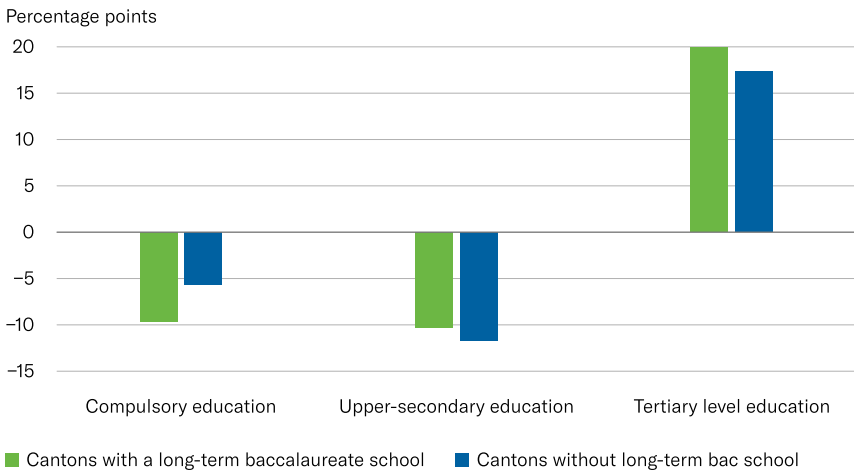
Reading example

In a canton without a long-term baccalaureate school and compared to a person whose parents have a compulsory school qualification, a person whose parents have an upper-secondary education qualification has a 3 percentage points higher probability of entering a baccalaureate school.

172 Shares of parents' educational qualifications in cantons with and without long-term baccalaureate school

Difference from the share of the reference population of the same age

Data: FSO (LABB), EDK (ÜGK 2017); calculations: SCCRE



Grading

International research literature has shown that there are biases in grading, for example due to gender (*Contreras, 2024*), migration background (*Alesina et al., 2024*) or the performance of fellow pupils (*Calsamiglia & Loviglio, 2019*). Studies for Switzerland exist for the cantons of Ticino (*Zanolla & Petrucci, 2024*), Geneva (*Denecker et al., 2024*) and Basel Stadt. The analyses used here from the canton of Basel Stadt show that girls as well as pupils who speak the school language at home receive grading advantages given the same level of performance on external standardized tests. However, this positive effect can only be observed for German, not for mathematics (*Oggenfuss & Wolter, 2025*). It is also clear that pupils from above-average classes receive significantly lower grades as measured by their test data from the external performance tests than comparable pupils from weaker-performing classes (→ *chapter Lower-secondary education, page 85*). The international research literature shows that pupils who have been overevaluated can still benefit from this later in their educational path; for example, they are more likely to have access to more challenging training courses (*Lavy & Megalokonomou, 2019; Lavy & Sand, 2018*) or can demonstrate better academic performance later on (*Muntoni & Retelsdorf, 2018*). Conversely, undervalued pupils also perform worse at subsequent levels of education (*Carlana, 2019; Robinson-Cimpian et al., 2014*) or choose a tertiary level qualification less often (*Sahlström & Silliman, 2024*). These results are explained by the fact that subjective evaluations act like a self-fulfilling prophecy by influencing the self-image of those affected (*Olczyk, Gentrup et al., 2023*). With regard to access to a baccalaureate school, analyses using data from the canton of Basel Stadt show that distortions in grading at lower-secondary level influence admission to a baccalaureate school and subsequently academic success at this level. Overvaluations in school grades in the tested subjects of German and mathematics increase the probability of transferring to baccalaureate school given comparable performance on external standardized tests. Pupils who

were overevaluated in mathematics also have a higher probability of successfully completing the first two years of baccalaureate school than people who were not overevaluated. There is no significant effect in this respect for German as a subject (→ Figure 174).

Gender and choice of special subjects

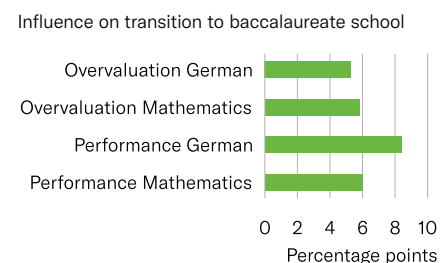
Men and women do not choose different subjects just during their studies; they are already studying different special subjects at baccalaureate school. Women are overrepresented in languages and humanities, while men are overrepresented in natural and exact sciences as well as in economics and law. However, gender segregation in the special subjects at baccalaureate schools has declined over the last ten years or so (→ Figure 175). For example, the proportion of women in the natural sciences and exact sciences as well as in economics and law increased, while it declined in languages.

These developments are also of interest in view of the pronounced shortage of skilled workers in STEM subjects. In order to counteract the under-representation of women in STEM subjects, there have been numerous interventions at all levels of education in recent decades, but most of these have not been evaluated for their potential long-term effects. One of the few exceptions is the latest study by Bamert (2025), which investigated the choice of subject by baccalaureate pupils who had taken part in events on STEM courses. Unlike baccalaureate pupils who had not attended such events, these events actually increased the probability of starting and completing a course of study in a STEM subject. The impact of these events was even stronger when the proportion of female speakers was high. This share influenced women and men in equal measure. The analyses also show that the proportion of interactive presentations correlates with the gender effect. Heterogeneity analyses show that the effect of interactive presentations has a gender component, as this only occurs with a high proportion of female speakers at STEM events (→ Figure 176). However, a high share of women is no longer significant with a high share of interactive presentations (→ Figure 177). The author therefore concludes that the gender effect is a consequence of the fact that women frequently present interactively at STEM events. In addition, the analyses show the following: If these events are not interactive but are designed purely for information transfer, they have no significant effect on student choice.

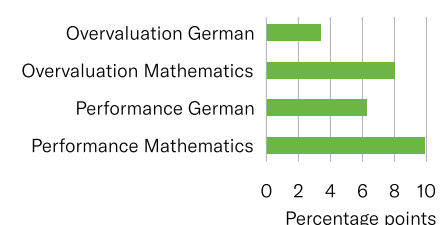
174 Influence of grading on transition and success

Estimated probabilities taking into account average class performance and school effects

Data: Canton of Basel Stadt, Bildungsraum Nordwestschweiz, FSO (LABB); calculations: SCCRE



Influence on success in the 1st and 2nd years of baccalaureate school



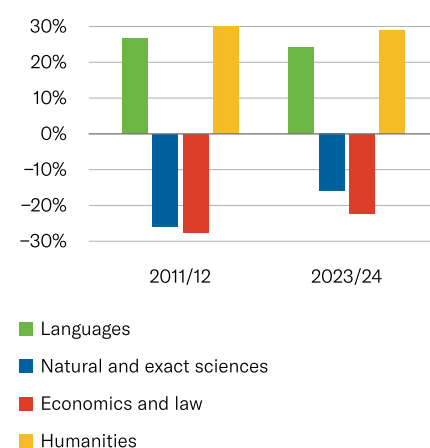
Reading example

The graphic shows the effects for a standard deviation, which is 0.7 grade points for the overvaluation in mathematics. The standard deviation of the overvaluation in German is 0.5 grade points. In the performance (from external performance tests), this is 73 points in German and 82 points in mathematics.

175 Share of women in special subjects

Difference from share across all subjects

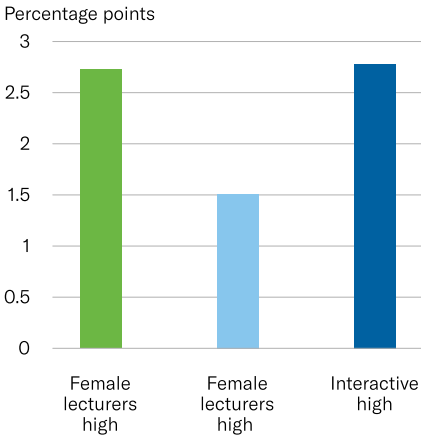
Data: FSO; calculations: SCCRE



177 Probability of a selecting a STEM subject

The difference from the reference category (persons who did not participate in a STEM event) is shown

Data: *Bamert (2025)*



Green bar: disregarding the share of interactive presentations

Blue bars: taking into account the share of interactive presentations

Female Ref. high = high share of female speakers (over 22%)

Interactive high = high share of interactive presentations

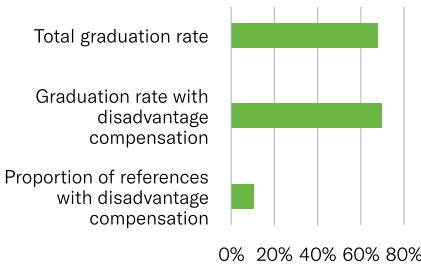
The light blue colour shows the statistically insignificant effect (5% significance level).

Reading example

With a high share of female speakers at STEM events (without control for the share of interactive presentations; green bar), the probability of choosing a STEM subject is 2.7 percentage points higher than if the person had not attended a STEM event.

178 Graduation rate at SMP and Passerelle, 2023

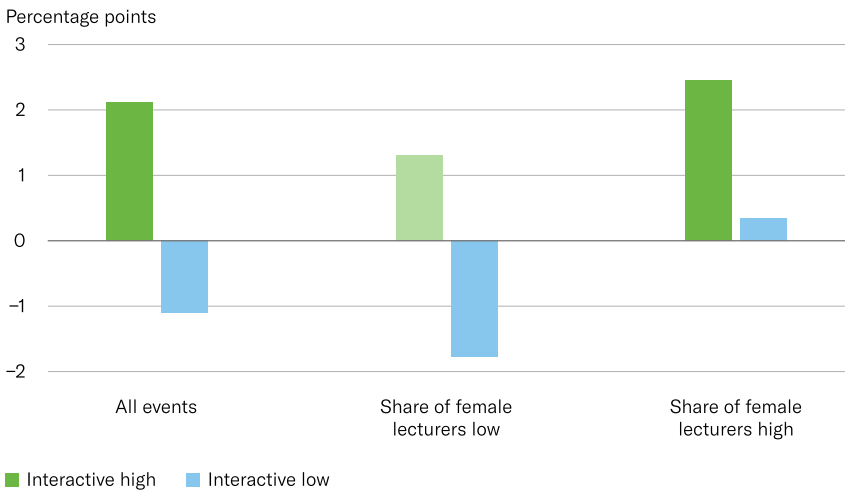
Data: Swiss Baccalaureate Commission



176 Probability of choosing a STEM subject

The difference from the reference category (persons who did not participate in a STEM event) is shown.

Data: *Bamert (2025)*



Interactive high/low: High/low share of interactive presentations

Light colours indicate statistically insignificant effects (5% significance level).

Compensation of disadvantages and promotion of talented individuals

In the area of compensation of disadvantages and the promotion of talented individuals, there is hardly any statistically usable data, which is why analyses on this topic are not possible. Almost all cantons have regulations in place for implementing compensation of disadvantages (*ZEM CES, 2022a*) and for promoting gifted individuals (*EDK-IDES, 2024a*). The federal government has also published a new guideline on the harmonisation of compensation of disadvantages in the area of the baccalaureate (*SMK, 2024*). This illustrates the significance of this issue and the need to be able to review the impact of the measures mentioned. However, the question of whether persons who were given the option of compensation of disadvantages during examinations are therefore more successful than comparable persons without this option cannot be investigated causally. Statistics on persons who passed the Swiss baccalaureate examination (SMP) as well as the supplementary exam (Passerelle) show, on the one hand, that persons with compensation of disadvantages are as successful in the examinations as pupils without this measure (→ Figure 178). Based on the available data, it remains unclear whether the compensation of disadvantages was actually decisive for the success of the examination. The question of whether there are differences in study success between examination graduates with and without compensation of disadvantages also remains unanswered. In addition, SMP and Passerelle certificates account for only a small proportion of all baccalaureate certificates. It is not clear how high the share of persons with compensation of disadvantages in these two examinations is compared to the share of persons with compensation of disadvantages on all baccalaureate examinations.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

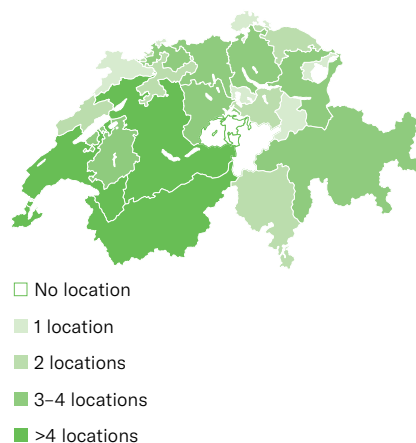
TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

UPPER-SECONDARY SPECIALISED SCHOOL

179 Number of FMS locations by canton, 2024

Data: EDK



The **proportion of FMS** (including specialised baccalaureate) at the upper-secondary level rose by 1.6 percentage points between 2012 (4.4%) and 2022 (6%). Over the same period, the proportion of students attending baccalaureate schools in Switzerland as a whole rose by 1.3 percentage points from 19.5% to 20.8%. This shows the increasing importance of general education over the past decade (→ *chapter Upper-secondary education, page 111*).

Origin of upper-secondary specialised schools (FMS)

Around 25 years ago, FMS were formed from what formerly was known as the upper-secondary diploma schools.¹ As in the case of baccalaureate schools, FMS offer general education at the upper-secondary level. Students can enter an FMS only if they have completed their compulsory schooling. FMS have three aims: They offer comprehensive general education, provide professional in-depth training to prepare students for tertiary programmes, and promote personal development (EDK, 2018). The programme takes three years and results in a specialised school certificate, giving the holder access to a professional education institution. An additional fourth year enables students to complete the specialised baccalaureate (SB) programme, which enables admission to universities of teacher education and professional-specific degree programmes at universities of applied sciences. The significance of FMS varies considerably among cantons, which also reflects in their number of locations. For example, the canton of Aargau has three FMS, while the canton of Vaud has twelve (→ Figure 179).

Cantonal FMS rates

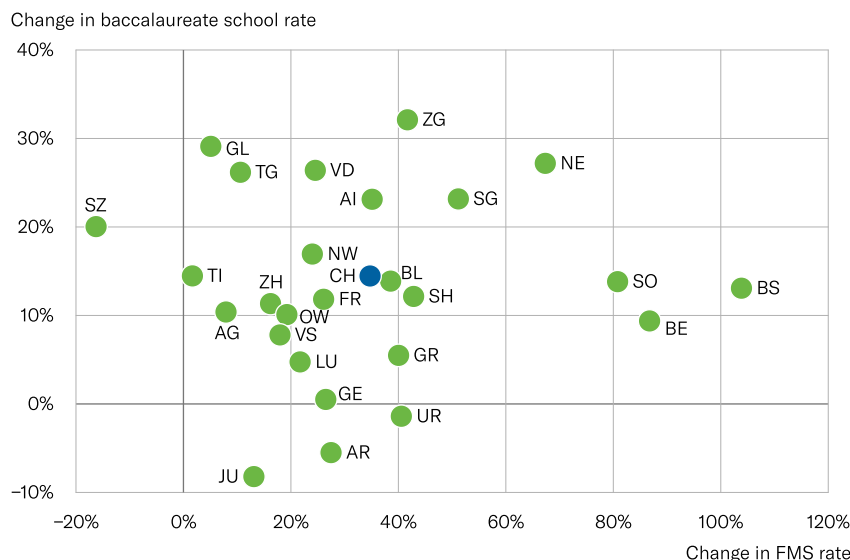
The FMS rates vary greatly by canton – between 1% (Canton Obwalden) and 15% (Canton Geneva) in 2022. In cantons with high rates of baccalaureate schools, the rates of specialised baccalaureate schools are usually also high – and vice versa. This situation has remained unchanged in recent years, and FMS do not play a compensatory role in any canton. In recent years, the FMS rate and the baccalaureate school rate have increased in most cantons, although the growth rates of these two education types do not correlate. The increase in FMS rates was much stronger in two-thirds of the cantons (→ Figure 180). At the same time, there are also major cantonal differences in the trend of the FMS rate: While the rate fell by 16% in the canton of Schwyz, it rose by 104% in the canton of Basel Stadt.

¹ The federal Vocational and Professional Education and Training Act (VPETA) of 2002 required a change of name for secondary schools (only tertiary qualifications can be referred to as “degrees”). The federal government’s take-over of responsibility for vocational training in the fields of health, social services, and the arts required a change in the training concept of the former diploma middle schools. The FMS project of the Swiss National Science Foundation (SNSF) examines this transformation and the associated legitimization, image and implementation topics from a socio-political perspective (Lee-mann et al., 2019).

180 FMS and bacculaureate school rates, by canton

Change in the FMS and bacculaureate school rates between 2012 and 2022: based on the mean value of 2012 and 2013 compared with the mean value of 2021 and 2022; proportion of compulsory school leavers entering an FMS or bacculaureate school directly (initial education); by canton of residence

Data: FSO (LABB); calculations: SCCRE



Regional differences also become apparent when looking at students who complete their compulsory education and those who finish an FMS. The cantons of Basel Landschaft and Basel Stadt have a higher FMS rate than the rest of German-speaking Switzerland and are therefore treated separately (→ Figure 181). The situation practically reverses between German-speaking Switzerland (excluding Basel Landschaft and Basel Stadt) and French-speaking Switzerland. German-speaking Switzerland has 70% of compulsory school leavers but accounts for only around one third of the FMS certificates. French-speaking Switzerland, on the other hand, has only 20% of compulsory school leavers but accounts for around 60% of the FMS certificates that are awarded. The reasons for these cantonal and regional differences lie in the supply of education as well as in its demand. The differences in preference also generally reflect in the proportions of learners attending bacculaureate schools and in the full-time VET programmes when compared to the proportion of learners completing an apprenticeship (→ *chapter Upper-secondary education, page 111*; → *chapter Bacculaureate school, page 151*).

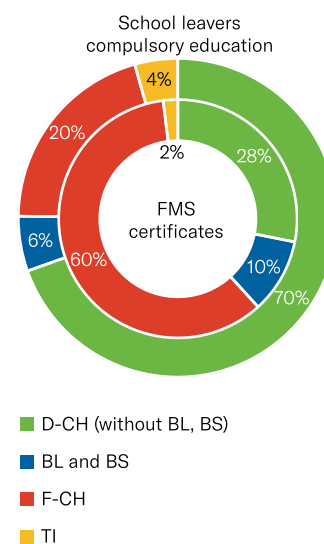
Reading example

In canton Bern, the average of the FMS rate for 2012 and 2013 was 2.3% and rose to an average of 4.4% by 2021 and 2022—an increase of 87%. Enrolment in bacculaureate schools increased by 9% over the same period. The analysis is based on learners' canton of residence – regardless of where they completed their upper-secondary education.

181 School leavers of compulsory education and of FMS

School year 2022/23; only FMS certificate

Data: FSO (LABB); calculations: SCCRE

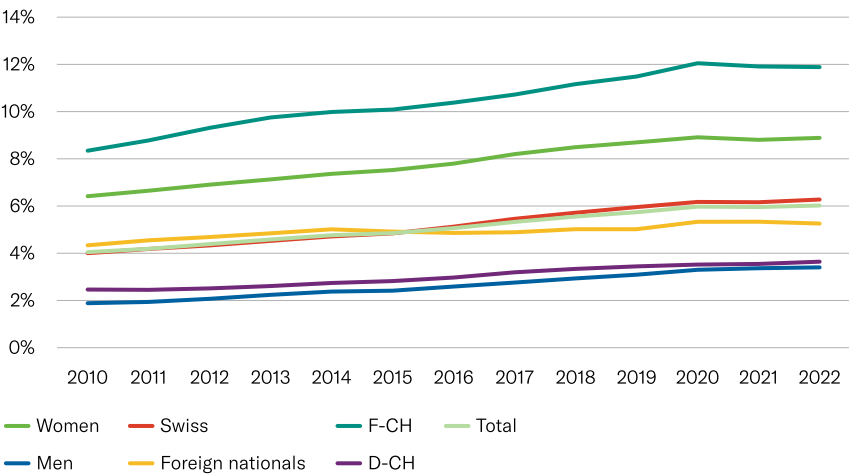


FMS students

The share of all upper-secondary education students attending an FMS increased starting in 2010 and has levelled off since 2020. This consistency since 2020 can also be observed in the various subgroups (→ Figure 182).

182 Rate of students in an upper-secondary school to those in an FMS

FMS students and specialised baccalaureate students included; mean values of two school years
Data: FSO (LABB); calculations: SCCRE



Reading example

In 2022, 8.9% of all women at the upper-secondary level attended an FMS. In the same year, 3.4% of all men at upper-secondary level attended an FMS.

Scenarios of the FSO for 2024–2033

The new scenarios confirm the forecast increase in student numbers for upper-secondary level as a whole. The reference scenario for students in the first FMS year anticipate a 19% increase between 2024 and 2033. A 21% increase is expected among specialised baccalaureates (FSO, 2025h).

Expenditures of the FMS

The FMS and other general education institutions (excluding baccalaureate schools) must now report their educational expenditures. According to the FSO, the total real expenditure per student in 2022 came to CHF 16,009, of which CHF 11,052 was spent on teachers' salaries.

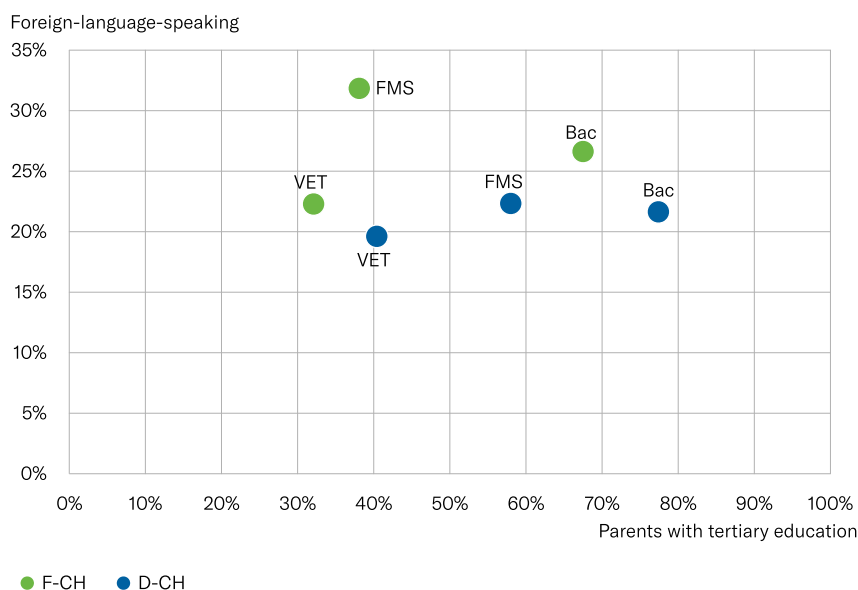
The proportion of women at FMS remained unchanged at 70% in 2022. The proportion of foreign nationals (21%) at FMS is slightly lower than their proportion of the total student population at upper-secondary level (24%).

When considering the student population at upper-secondary level in terms of their language and their parents' educational background, the following becomes apparent: The proportion of parents with a tertiary education is highest among baccalaureate students. Compared to baccalaureate students, FMS students are more likely to have parents with a foreign-language background and without a tertiary degree. For all three education types – vocational education and training (VET), baccalaureate, and FMS – the proportion of foreign-language speakers in German-speaking Switzerland is between 21% and 23%. In French-speaking Switzerland, on the other hand, VET has the lowest proportion of foreign-language learners, while their proportion in FMS is clearly the highest at almost 32% (→ Figure 183). Although there is evidence that foreigners generally have a stronger preference for schools offering general education (Abrassart et al., 2020), the differences among the language regions indicate that the extent of this preference depends on the range of the general education services available.

183 Composition of the student body at upper-secondary level

Proportion of foreign-language students (first language differs from the school language) and proportion of students with parents with tertiary education by upper-secondary education type (VET: Basic vocational training, Bac: Baccalaureate school); mean values for 2021 and 2022

Data: FSO (LABB); calculations: SCCRE



FMS programmes

There are FMS in 22 cantons in Switzerland, the majority of which are affiliated with baccalaureate schools. The training takes place in six different occupational fields, some of which are also available in combination, such as health and social work. The offer in the cantons remains largely unchanged (in the canton of Ticino, the “Music and Theatre” programme has been discontinued) (→ Figure 184). To develop FMS further, the Swiss Conference of Cantonal Ministers of Education (EDK) revised the recognition rules and the framework curriculum in 2018. This means that at least half of the teaching time must now be devoted to general education and at least 20% must be devoted to VET programmes. In addition, the field of health/natural sciences was introduced as a specific sub-category for the specialist field of health (EDK, 2018).

The distribution of students across occupational fields shows that FMS programmes largely focus on health, pedagogy and social services. This emphasis is likely to be due to the reciprocity between supply and demand. German-speaking Switzerland (excluding Basel Landschaft and Basel Stadt) has the highest proportion (43%) of students in the field of pedagogy (the canton of Ticino does not offer this field). When combined with the field of social work, this makes up a total of 70% of all students. In other regions, however, the proportion of students in the health fields is significantly higher than in German-speaking Switzerland. In French-speaking Switzerland, it is 31% (→ Figure 185).

184 Cantonal FMS programmes, by occupation, 2024

The Cantons of Appenzell, Innerrhoden, Nidwalden, Obwalden and Uri do not have FMS; sport is not a nationally recognised occupational field in Switzerland.

Data: EDK-IDES

Occupational fields	Cantons
Health / natural sciences	21 cantons, excl. LU
Pedagogy	21 cantons, excl. TI
Social work, social sciences	21 cantons, excl. GL
Communication and information	AG, BS, GE, GL, SH, TG, VD, ZH
Design and art	AG, BL, BS, GE, JU, SG, VD
Music and theatre	BS, GE, JU, LU, SG, VD
Sport	JU

186 Admission procedures and requirements for baccalaureate and FMS

Cantons with no FMS: Appenzell Innerrhoden, Nidwalden, Obwalden and Uri

Data: EDK-IDES (2024g)

Cantons	Acceptance Baccalaureate school	Acceptance FMS	Requirements
BE			
LU			
SZ			
GL			
ZG			
FR			
SO			
BS			
BL			
SH			
AR			
SG			
GR			
AG			
TG			
TI			
VD			
VS			
NE			
GE			
JU			

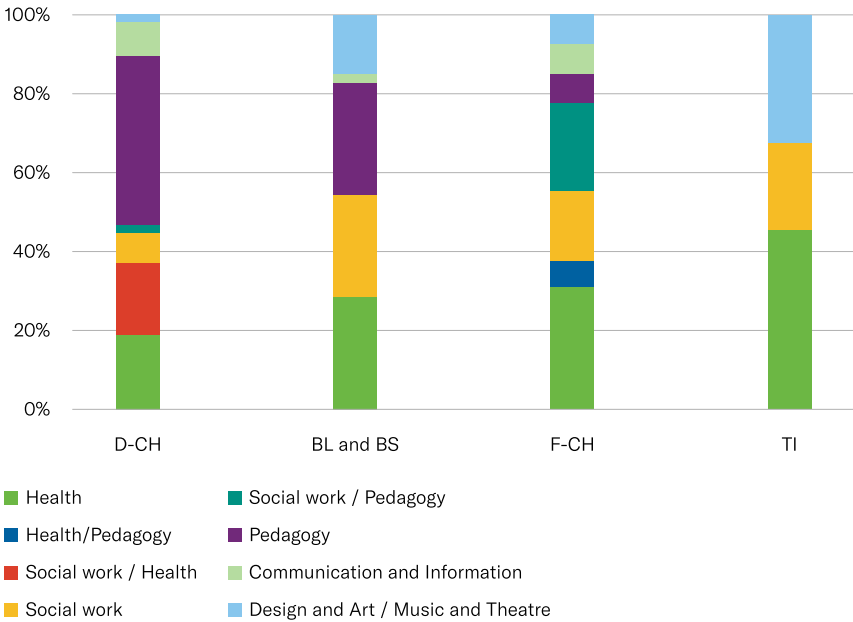
- Generally no entrance exam
- Entrance exam if the prerequisites for exemption from the exam are not met
- Generally with entrance exam
- Lower entry requirements (practical grades/ exam results) for the FMS than for the baccalaureate in at least one requirement profile
- Insufficient information for comparison

VD: Students with the pre-baccalaureate requirements profile of lower-secondary education can enter a FMS or baccalaureate school without an exam. Students with other requirements profiles must reach a total score for the FMS; they are not admitted to a baccalaureate school.

185 FMS students by occupational field and region, 2022/23

Without students in the foundation year and no specialised baccalaureates; health also includes health/natural sciences; design and art as well as music and theatre have been combined here. Basel Landschaft and Basel Stadt have a higher FMS rate than the rest of German-speaking Switzerland and are therefore shown separately.

Data: FSO (LABB); calculations: SCCRE



Admission requirements and skills

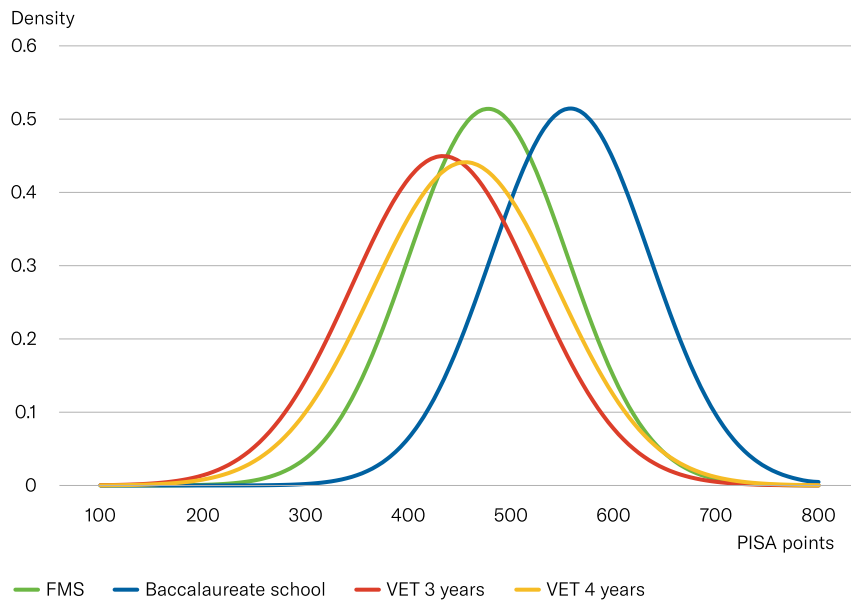
The cantonal admission procedures for schools offering general education at upper-secondary level vary greatly by canton. However, they can be divided into three broad categories (→ Figure 186). The admission requirements also differ in terms of the grades that students earn previously and in the way these are considered. In general, the requirements for baccalaureate schools are higher in many cantons than they are for the FMS (EDK-IDES, 2024g).

When using PISA data to examine the entry-level skills of students in reading and math in relation to the upper-secondary programmes they choose, a correspondingly clear scale becomes apparent on the one hand, while major overlaps can be identified on the other. The latter is also due to cantonal differences in the entry requirements for general education schools. However, the average skills of baccalaureate students are highest in both reading and maths. FMS students have better reading (→ Figure 187) but worse maths scores (→ Figure 188) than students in four-year VET programmes. This can be explained partially by the higher proportion of women in FMS compared to four-year apprenticeships. Men with stronger maths skills tend to choose technically demanding apprenticeships and women with stronger reading skills tend to opt for FMS.

187 Reading scores in first-choice programmes at upper-secondary level

Normal distribution of PISA points in reading; learners who completed the 11th school year and started upper-secondary education in the 2022/23 school year

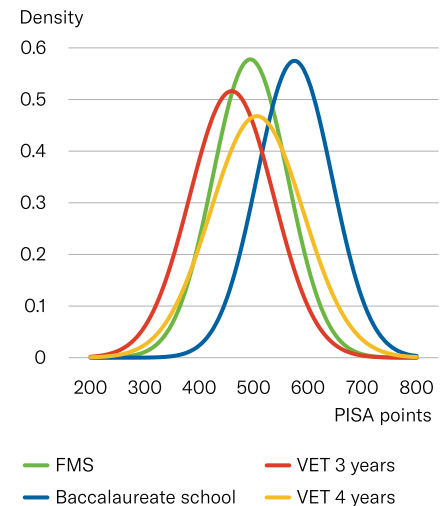
Data: SCCRE (SEATS II); calculations: SCCRE



188 Maths scores following the first chosen course at upper-secondary level

Normal distribution of PISA points in maths; learners who in the 2022 PISA survey had completed the 11th school year and started upper-secondary education in the 2022/23 school year

Data: SCCRE (SEATS II); calculations: SCCRE



Digitalisation and learning with digital aids

The core FMS syllabus lays out the aims for teaching the general skills required for coping with digitalisation at work and in everyday life (EDK, 2018). Due to a lack of data, it is not possible to verify the extent to which these aims are being met. FMS, however, are part of the “Monitoring the digitalisation of education from the students’ perspective” project. Between 2020 and 2024, the availability and use of digital aids in schools was recorded by means of four waves of surveys across Switzerland from primary to upper-secondary education (Oggenfuss & Wolter, 2024). Detailed evaluations of only FMS are not always possible for the individual waves of the surveys due to the small number of cases, and conclusions about the use of AI for educational purposes are therefore possible only for all students in general education programmes, which were surveyed for the first time in 2024. More than three-quarters of students in general education schools use ChatGPT both in class and at home (→ *chapter Upper-secondary education, page 111*). Overall, women use generative AI less frequently than men (→ *chapter Baccalaureate school, page 151*). Since 70% of FMS students are women, the use of AI is therefore likely to be lower there than in baccalaureate schools.

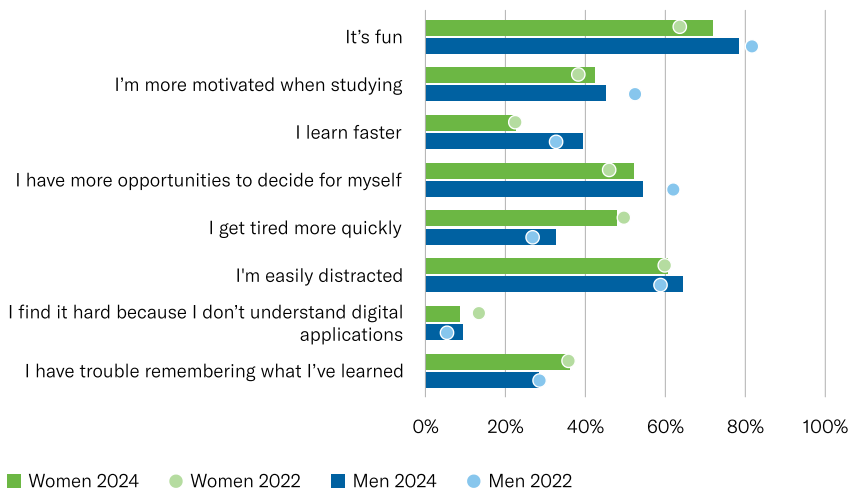
Digital aids are an integral part of everyday life for students in general education schools – 95% use them weekly, 85% use them daily (→ *chapter Upper-secondary education, page 111*). Students’ attitudes towards digital aids compared to conventional learning media remained largely the same in 2024 compared to 2022. For young people, the benefits still clearly outweigh the disadvantages – even though more than half report being distracted by

digital aids. Gender differences have evened out in some areas, such as the difficulty of using digital applications, while in other areas (motivation, pace of learning, fatigue) they remain a concern. In 2024, more women were receptive to digital learning than in 2022, but they continued to rate it slightly more critically than men (→ Figure 189).

189 Attitude towards learning with digital tools, by gender

Surveys in 2022 and 2024; attitude towards learning with digital aids versus learning without them; proportion of students in upper-secondary general education schools who agree with the statements; after controlling for individual background variables

Data: SCCRE (Monitoring digitalisation); calculations: SCCRE



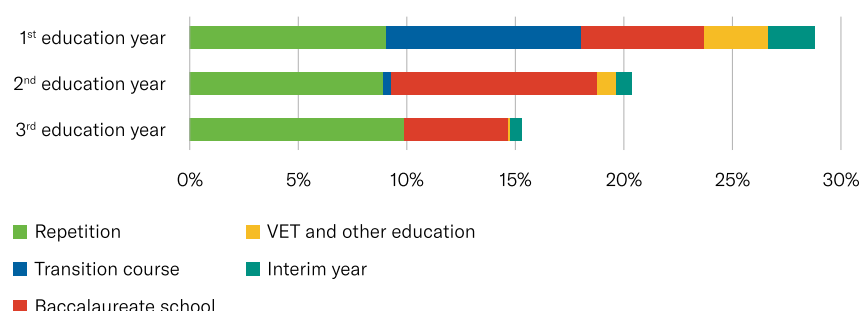
Education paths and repetition

Most learners enter the first year of FMS immediately on completion of their compulsory education (71% of an entry cohort). Other learners enter from a baccalaureate school (6%) or a vocational education and training (VET) institution (3%). In addition, 9% enter the first year of FMS after completing a transitional programme or a motivation semester (SEMO) (→ chapter Upper-secondary education, page 111). 11% of learners, mainly from a baccalaureate school, do not start the FMS with the first year but enter directly into the second school year (→ Figure 190). Admission into the third year is rare and permitted only in a few cantons (Fribourg, Geneva, Valais and Vaud) of French-speaking Switzerland. The educational path of the students is marked not only with changes in their education and training programme but also with repetitions. 39% of students do not complete the FMS directly (FSO, 2024f). The number of students who repeat courses indicates significant differences by language region (→ Figure 191). However, the reasons for these differences cannot be explained based on the available data.

190 Admissions to FMS, 2022

Education in the year before the educational year at the specialised school concerned; the other admissions took place directly after compulsory schooling and are not shown

Data: FSO (LABB); calculations: SCCRE



Reading example

9% of FMS students in the first year of the programme were already in the first year of the FMS in the previous year and are repeating that year (green).

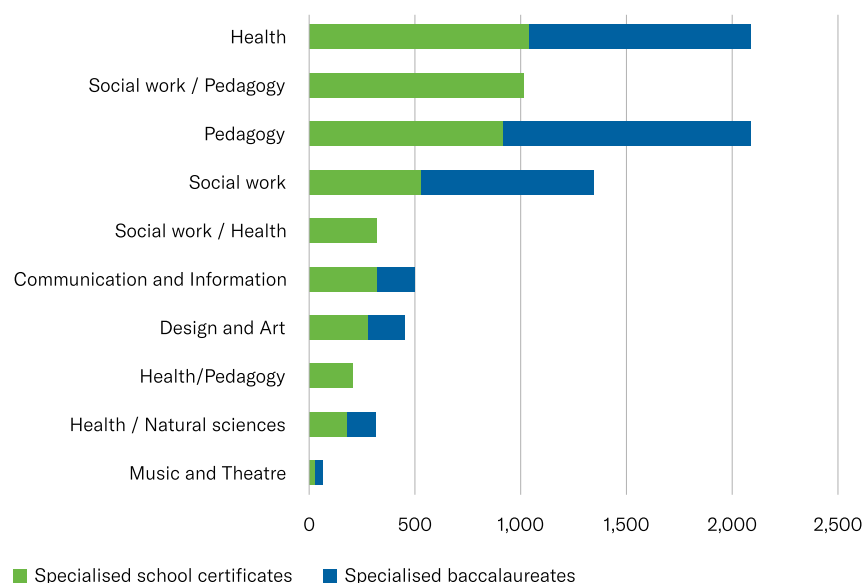
9% of FMS students in the second year of the programme had attended a baccalaureate school in the previous year (red).

Completion of FMS programmes

The largest number of students who complete the FMS programme get a diploma or certificate in the fields of health and pedagogy (→ Figure 192). This is partly because the FMS certificate and the specialised baccalaureate certificate in health enables them to access the next level of nursing training in the non-university tertiary sector. The second largest number of students who complete the FMS programme receive a qualification in pedagogy, which, among other things, is because the specialised baccalaureate qualifies them to enter any universities of teacher education (→ *chapter Universities of teacher education, page 269*).

192 Number of FMS qualifications, by occupational field, 2023

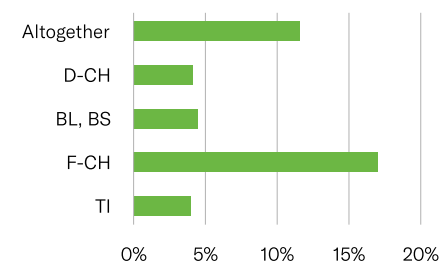
Data: FSO



191 Repetitions at the FMS by language region

Proportion of students who repeated the first year of the FMS; average values for the school years 2020/21 and 2021/22

Data: FSO (LABB); calculations: SCCRE



The number of completed social work / information and communication and sport programmes is not included as there were fewer than ten.

Transfers after the FMS

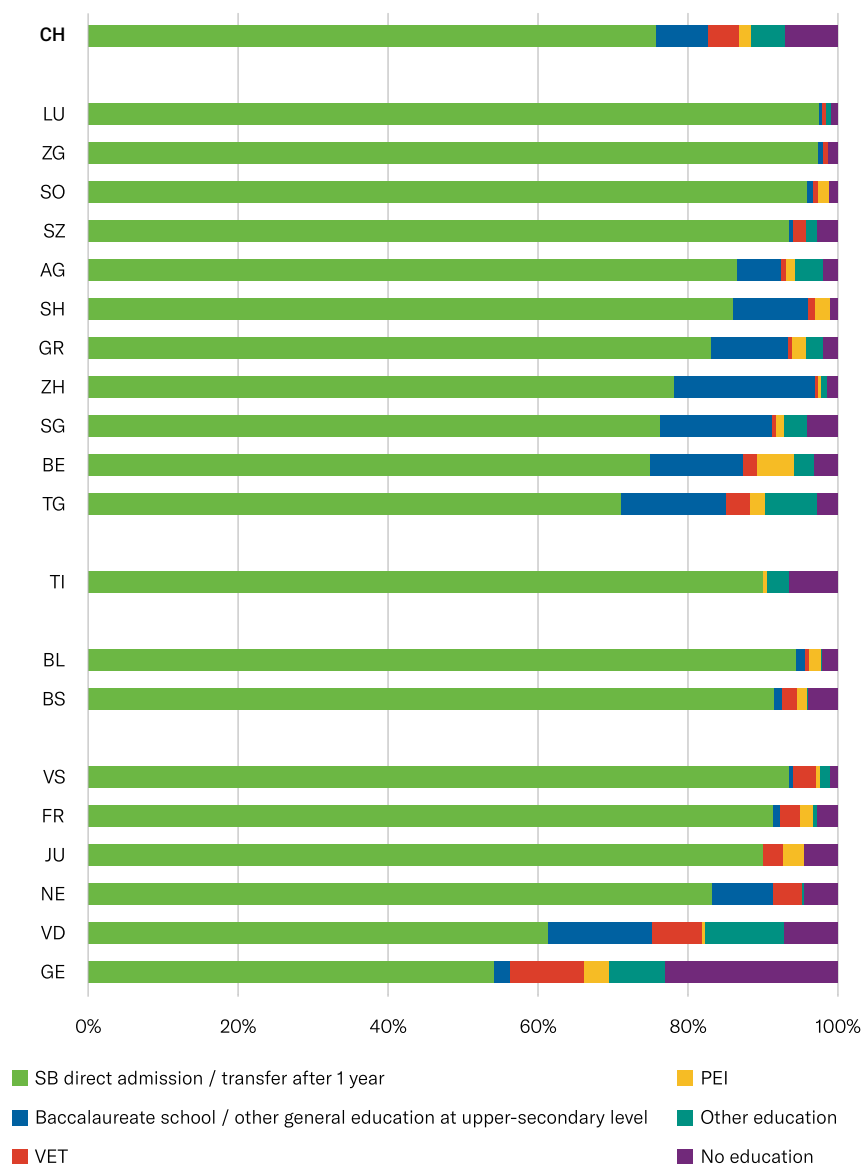
The educational objective of the FMS is to prepare students for education and training in the non-university tertiary sector, i.e. at a university of applied sciences or a university of teacher education, or in the field of professional education. Transfers to these tertiary education types are therefore also decisive for assessing education and training efficacy at FMS. The extent to which such transfers occur can be shown by means of the longitudinal data from the Federal Statistical Office (FSO). However, before transferring to a tertiary programme, the majority (76%) of students continue their studies at the FMS after receiving their FMS certificate so as to acquire the specialised baccalaureate qualification. Around 7% enter a baccalaureate school, and 4% start in a VET programme. A further 7% do not complete any further programme within one year after having completed the FMS programme.

Major regional differences in these educational paths exist as well. For example, the proportion of those who obtain a specialised baccalaureate within one year after obtaining the FMS certificate varies considerably by canton (→ Figure 193). In approximately half of the cantons – including Lucerne, Solothurn and Valais – more than 90% choose to do so, while in other cantons (Geneva and Vaud) just over half of them make this choice. Persons who choose another path at the upper-secondary level after obtaining the FMS certificate mostly continue their education at a baccalaureate school. In several cantons (St. Gallen, Thurgau, Vaud and Zurich), this group accounts for 15% to 20% of graduates. The proportion of those who transfer to a VET programme is higher in French-speaking Switzerland than in the other language regions; in the cantons of Vaud and Geneva it is around 10%. On average in Switzerland, around 7% of graduates are not in any formal education programme until one year after they obtain the FMS certificate.

193 Enrolment in a programme after obtaining the FMS certificate, by school canton

Transfers up to one year after completion of the FMS with the FMS certificate; graduation cohorts 2019–2021; excluding Appenzell Innerrhoden, Nidwalden, Obwalden and Uri (no FMS) and without Appenzell Ausserrhoden and Glarus (case numbers too low)

Data: FSO (LABB); calculations: SCCRE

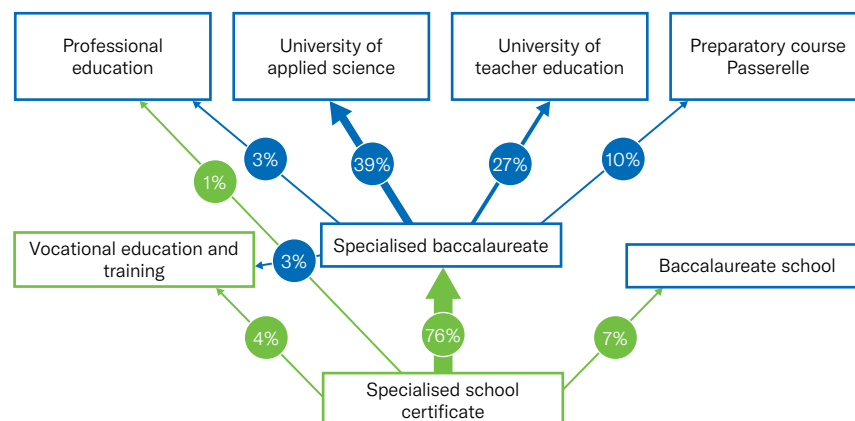


After completing the specialised baccalaureate, 86% of graduates continue their education. The majority attend a university of applied sciences (39%) or a university of teacher education (27%) (→ Figure 194). As in the case of those with a federal vocational baccalaureate, those with a specialised baccalaureate can enrol in a preparatory course Passerelle and start a university programme if they pass the supplementary exam Passerelle. Since 2017, when access was granted to specialised baccalaureates, the number of those who complete the preparatory courses Passerelle has increased, largely due to upper-secondary specialised school graduates (→ *chapter Vocational education and training, page 127*).

194 Transfers after obtaining an FMS certificate and after the specialised baccalaureate

Cohorts of FMS graduates in 2021; cohorts of specialised baccalaureate graduates in 2021; transfers up to 1 year after graduation

Data: FSO (LABB); calculations: SCCRE



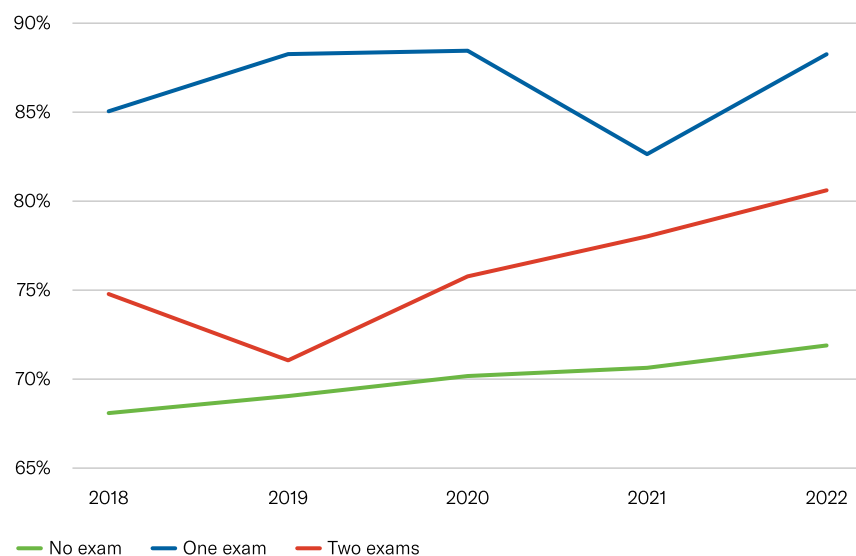
COVID-19 pandemic and the trend in transfers

In 2020, the COVID-19 pandemic led to changes in exam regulations at upper-secondary level in several cantons. While some cantons did not administer any final exams, others conducted only written or oral ones. 94% of the exam candidates obtained a specialised school certificate in 2020, thus reducing the failure rate from 10% to 6% compared to previous years (2015–2019). Failure rates traditionally vary strongly by canton and were between 1% and 26% in recent years. Irrespective of this, the rate was lower in almost all cantons in 2020, which can be attributed to the changes in exam procedures. This raises the question of whether these exceptions affected the 2020 graduate cohort's continued education path. When looking at direct transfers from FMS to the specialised baccalaureate, no post-COVID effect has been identified (→ Figure 195). All cantons had resumed their regular exam regulations with two exams already by 2021, and the fluctuations are thus not directly related to the 2020 exceptions. The transfer rates remained consistent across all cantons between 2018 and 2022. A lower transfer rate can be observed only in the cantons of Graubünden, St. Gallen and Zurich, for unclear reasons.

195 Rate of direct transfers after obtaining the FMS certificate, by type of exam modality, 2020

Direct transfers after the FMS certificate or after continuing the programme to obtain the specialised baccalaureate certificate; cantons are grouped by exam modality in 2020 (margin note); excluding Appenzell Innerrhoden, Nidwalden, Obwalden and Uri (no FMS)

Data: FSO (LABB); calculations: SCCRE



Exam type in the COVID year 2020

One exam: AG, AR, GR, LU, SG, SZ, ZG

Both exams: GL, NE, SH, TG

No exam: BE, BL, BS, FR, GE, JU, SO, TI, VD, VS, ZH

Reading example

The green line shows the transfer rate of the cantons (see grouping above) in which no exams were held in 2020. In 2020, 70% of FMS graduates continued their education directly to obtain the specialised baccalaureate diploma. This rate increased continuously under regular exam conditions in the previous years and in subsequent years.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

TERTIARY-LEVEL EDUCATION

CROSS-CUTTING THEMES

196 Courses at tertiary level

Data: FSO (2015)

ISCED level	Description	Swiss education programmes
5	Short tertiary educational programmes	Non-VPETA-regulated professional education
6	Bachelor's degree or equivalent	Bachelor's degree programmes at higher education institutions; graduates at professional education institutions; professional examinations (Federal Diploma of Higher Education)
7	Master's or equivalent	Master's courses at higher education institutions; advanced professional examinations (Advanced Federal Diploma of Higher Education)
8	Doctorate or equivalent	Doctorates; post-doctoral qualifications

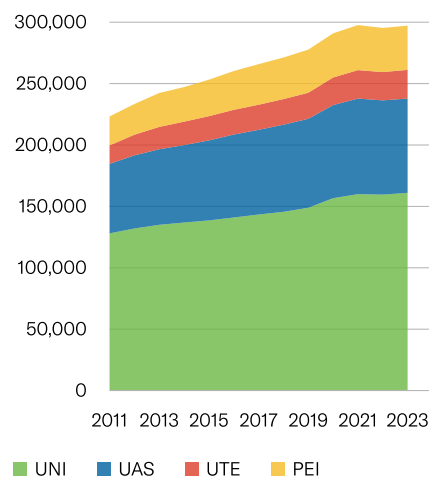
VPETA Federal Act on Vocational and Professional Education and Training (Vocational and Professional Education and Training Act) of 13 December 2002

Continuing education qualifications (Master's of advanced studies [MAS]) are not considered formal but non-formal education in the Swiss education nomenclature and in the corresponding statistics. They are therefore not included in this overview.

197 Students 2011–2023

All students at tertiary level without continuing education and training

Data: FSO (SHIS-studex); calculations: SCCRE



Tertiary system

In addition to the entire higher education sector, tertiary-level education also encompasses the field of vocational and professional education and training (PE). The university sector includes universities (UNI), cantonal universities, federal institutes of technology (ETH), universities of applied sciences (UAS) and universities of teacher education (UTE). The vocational and professional education and training consists of professional education institutions (PEI) as well as the professional examinations (Federal Diploma of Higher Education) and the Advanced Professional Examination and master examinations (Advanced Federal Diploma of Higher Education). According to the International Standard Classification (ISCED 2011), tertiary-level education is assigned to the following education levels (→ Figure 196): The Bachelor's degrees of higher education institutions, the qualifications of the professional education institutions, as well as federal diplomas of higher education fall under ISCED Level 6; the Master's programmes of higher education institutions as well as advanced professional examinations fall under Level 7. Doctorate and post-doctoral qualifications are classified in level 8 (FSO, 2015).

The diversity of the tertiary sector, with its different types of higher education institution and professional education qualifications, has grown historically. The differentiation of upper-secondary education into a general education and a vocational education sector will continue at tertiary-level education. These two sectors differ fundamentally in terms of their entry prerequisites, institutional requirements and funding. This overview chapter covers the tertiary level as a whole; however, the better data available allows the sector of the higher education institutions to be presented in more detail than professional education (PE). When considering the distinction between the types of higher education institutions (HEI), it must be noted that in the following explanations, the teacher education located at UASs is classified as UTEs in each case, as it is organised according to the rules that apply to UTEs, irrespective of any institutional affiliation.

In terms of student numbers, tertiary-level education has expanded strongly over the past decade, amounting to well over 30%. The highest relative growth rates were recorded at the universities of teacher education and the professional education institutions (→ Figure 197). In terms of numbers, universities dominate with more than half of all students at tertiary level, which is due to the longer duration of studies at universities. A good third of students are divided between UASs and UTEs; a good 10% of students are enrolled at professional education institutions. If the number of educational qualifications awarded per year is taken into account, the higher education sector is less dominant in terms of numbers. Professional education accounts for around one-third of all tertiary qualifications each year, with federal professional examination alone accounting for a good 20% (→ Figure 198).

Educational level of the population

The tertiary share of 25- to 34-year-olds has doubled since the turn of the millennium in Switzerland: Every second person in this age group now has a tertiary degree. The process of tertiary education was mostly driven

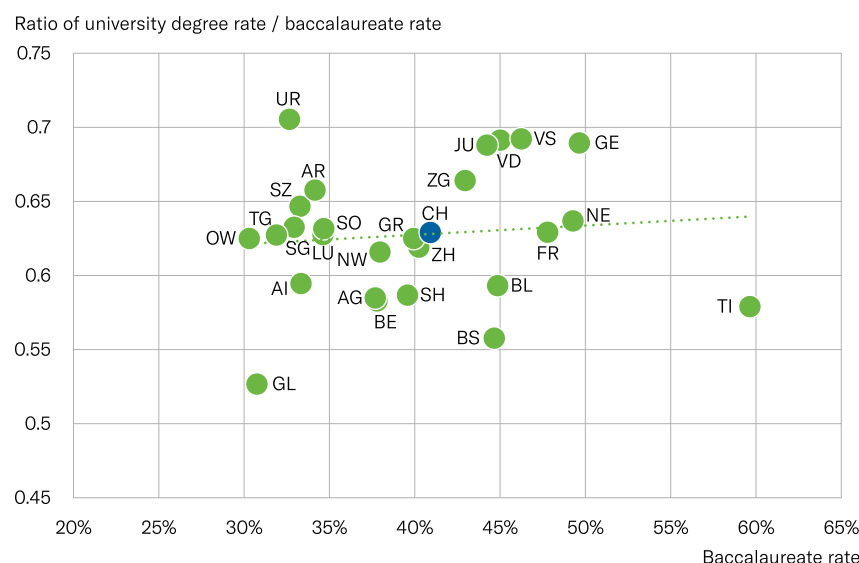
by the reform of the higher education system reforms in the mid-1990s during which the UASs and the UTEs were established, rather than by the universities. The growth is also due to the increased share of women in baccalaureate programmes (→ *chapter Baccalaureate school, page 151*), which, with a time lag, has subsequently led to more women in universities in Switzerland than men.

A comparison between the cantons shows that the potential of possible university degrees (from universities, universities of applied sciences or universities of teacher education) does not depend on the level of the baccalaureate rate. The figure below shows this utilisation – measured as the ratio of the university graduation rate to the baccalaureate rate – shown in relation to the baccalaureate rate (→ Figure 199). The diagram enables us to draw conclusions about the extent to which baccalaureate degrees in the individual cantons lead to university degrees. Cantons with high baccalaureate rates tend to have higher university graduation rates; however, there is a great deal of variation: Of ten baccalaureate students, a good five graduate from a university in the canton of Basel Stadt, while seven graduate from a university in the canton of Vaud. The potential for university degrees is thus better exploited in the canton of Vaud.

199 Baccalaureate rate and university degrees

Baccalaureate rate (UNI, UAS, UTE) by canton of residence and ratio of university degree and baccalaureate rate (utilisation rate); cohort of individuals aged 15 in 2012 (qualifications obtained up to 2023)

Data: FSO (LABB); calculations: SCCRE

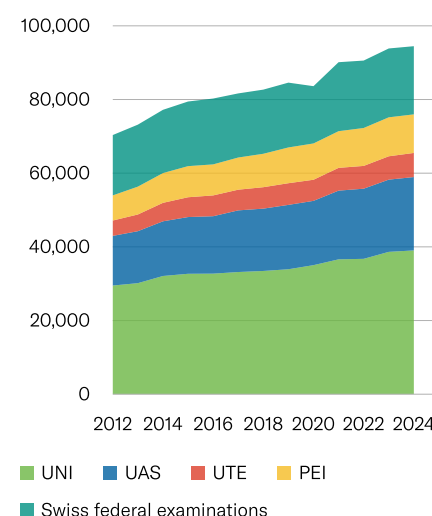


Despite a comparatively low baccalaureate rate, Switzerland has an above-average tertiary education rate of more than 50% compared to OECD countries (→ Figure 200). In 2022, this figure was thus well above that of neighbouring countries and above the OECD average of 47%. Taking into account professional education, which accounts for around one-third of all tertiary-level qualifications, Switzerland is thus able to qualify a high proportion of persons with tertiary-level qualifications despite a relatively low proportion of general education qualifications at

198 Graduations 2012–2024

All tertiary-level education qualifications without continuing education and training

Data: FSO (SHIS-studex); calculations: SCCRE



Reading example

The higher the ratio of the university degree rate to the baccalaureate rate (shown on the y axis), the greater the potential for university degrees is exploited: For example, the canton of Vaud has a baccalaureate rate of 45% and a tertiary-level graduation rate of 31% (utilisation rate: 0.69), while the canton of Basel Stadt has a rate of only 25% for university degrees with the same baccalaureate rate (utilisation rate: 0.56). With regard to the different baccalaureate rates, it can be stated that six out of ten young people in the canton of Ticino acquire a baccalaureate, while in the canton of Bern it is less than four. At the same exploitation rate (0.58), this results in three and a half university degrees in the canton of Ticino and a good two in the canton of Bern.

upper-secondary level. It makes sense to include professional education and training in this rate because other countries without a separate higher vocational education system often offer such programmes at universities.

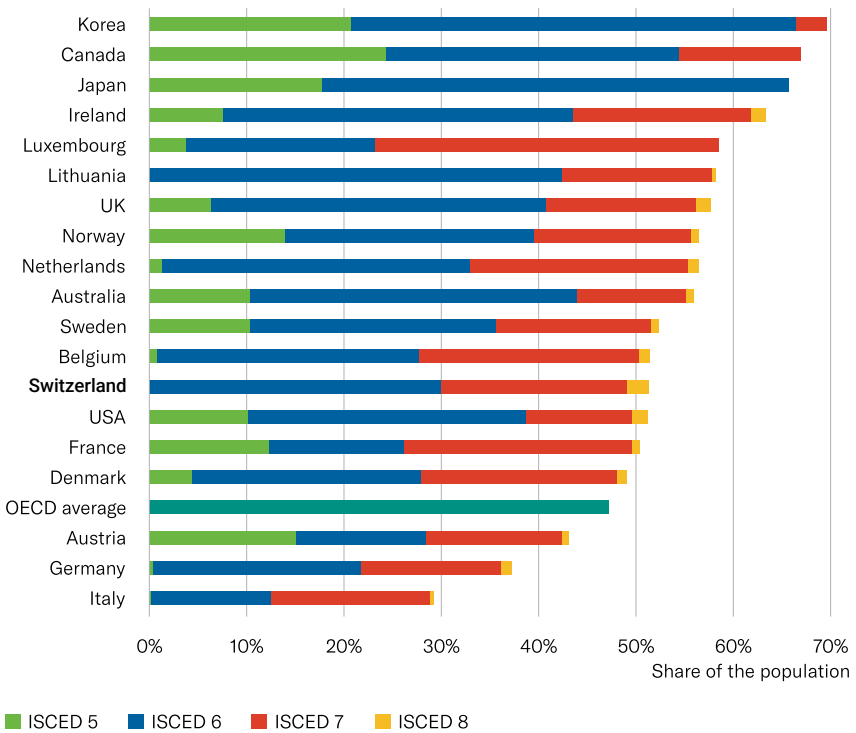
200 International comparison of education status of 25- to 34-year olds, 2022

Tertiary-level qualifications (higher education institutions and professional education)

Data: OECD; calculations: SCCRE

- ISCED 5 Short tertiary education programmes (short cycles)
- ISCED 6 Bachelor's including MAS (UAS/UTE) or equivalent graduations of PE
- ISCED 7 Master's including MAS (UNI) or equivalent graduations of PE
- ISCED 8 Doctorate; post-doctoral qualification

Unlike the Swiss nomenclature, international statistics record MAS qualifications as formal education at ISCED level 6 or 7.



The overall tertiary rate encompasses a wide range of qualifications that cannot be easily compared with each other. Thus only a differentiated view of the different qualification levels makes it possible to determine the level of education of the population of a country. While some tertiary systems focus on lower-level qualifications (short cycles and Bachelor's), postgraduate levels (Master's, Doctorate) dominate in other countries. Other than in countries with very high tertiary rates, more than 20% of the young population in Switzerland hold a postgraduate degree (Master's or higher). This corresponds to more than 40% of all tertiary sector graduates. As a result, Switzerland has an above-average tertiary education rate, and the proportion of highly qualified people in Switzerland's young workforce is very high.

Legal basis for HEIs

The federal government and the cantons are jointly responsible for coordinating and assuring quality in higher education. The legislative framework enacted by federal government is the Federal Act on Funding and

Coordination of the Higher Education Sector (HEdA)¹; for the cantons it is the Higher Education Concordat. An agreement between the federal government and the cantons on cooperation in higher education defines the scope for the two elements of the legislative framework, declares the aims of the Federal Act on the Funding and Coordination of the Higher Education Sector as joint objectives of the federal government and the cantons, and thus creates the basis for the joint bodies, namely the Swiss Conference of Higher Education Institutions (SHK), the Rectors' Conference (swissuniversities), and the Accreditation Council. As the supreme body responsible for higher education policy, the Swiss Conference of Higher Education Institutions is responsible for coordinating the activities of the federal government and the cantons in the higher education sector. The Rectors' Conference (swissuniversities) includes the rectors of UNIs, UASs and UTEs. It is responsible for coordination and cooperation amongst these institutions.

The Swiss Agency of Accreditation and Quality Assurance in Higher Education (AAQ) carries out the accreditation procedures, which are ultimately decided by the Accreditation Council – an independent expert body. Institutional accreditation is a prerequisite for the right to use reserved designations, in other words, firstly for the law that permits an institution to call itself a “university”, a “university of applied sciences” or a “university of teacher education”, and secondly for obtaining federal funding (Art. 28, para. 2 HEdA). Accreditation of programmes (BA and MA) is voluntary. In accordance with the Federal Act on the Funding and Coordination of the Higher Education Sector, the ten cantonal universities and the two Federal Institutes of Technology are currently (as of 2025) accredited as universities (→ *chapter Universities*, page 211). Ten higher education institutions are accredited as universities of applied sciences, one of which is organised under private law (→ *chapter Universities of applied sciences*, page 243). In addition, 19 higher education institutions are accredited as universities of teacher education, two of them under private law (→ *chapter Universities of teacher education*, page 269). Finally, there are 14 institutions that are accredited as UNI or UAS institutes; the majority of these are higher education institutions and institutions organised under private law.

Profiles of education types at tertiary-level education

The differentiation of tertiary-level education into different types of HEI and educational programmes, each with its own profiles and tasks, is one of the specific features of the Swiss education landscape. The federal government and the cantons are committed to a clear profile of offerings at tertiary-level education and have therefore declared “sharpening profiles at tertiary-level education” as one of their common education policy objectives (EAER & EDK, 2023). The various education types should complement each other and the permeability between the types and areas should be promoted in order to improve the career options of the individual.

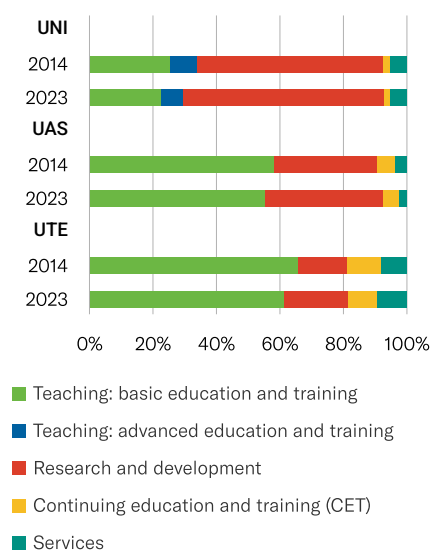
The various profiles of the higher education institution types, which play a role in how federal funding is assessed, are also reflected in the fact

¹ Federal Act on Funding and Coordination of the Higher Education Sector (Higher Education Act, HEdA) of 30 September 2011.

201 Share of performance types by HEI type

In FTEs of academic staff, 2014 and 2023

Data: FSO (SHIS-PERS); calculations: SCCRE



Types of performance according to Swiss Federal Statistical Office (FSO)

Teaching

Term for all activities which primarily concern the teaching of students (Bachelor's, Master's, Diploma and Doctorate) or are associated with them. A distinction is drawn between regular teaching (BA and MA programmes) and more advanced teaching (Doctorate).

Research and development (R&D)

The term refers to systematic, creative endeavours to expand knowledge and to use it to discover new applications and/or to repurpose tried-and-tested scientific achievements.

Continuing education and training

Term for all activities within the scope of continuing and executive education programmes in the post-diploma sector.

Services

Term for all academic and non-academic activities of a predominantly routine nature relating to neither research and development nor to teaching and that are primarily directed at audiences outside of the higher education institutions.

that the share of staff allocated to the various types of focus greatly varies. While the main focus of universities staff is on research, more than two-thirds of staff in general universities of applied sciences and universities of teacher education are allocated to teaching and continuing education and training. The strong focus on teaching at UAS and UTEs has not changed in recent years, even if there has been a slight pro rata shift towards research at the expense of teaching at all three types of HEI (→ Figure 201).

Various empirical studies document the expansion of research and development at UASs and UTEs over time. However, they also show that the differentiation between the profiles of HEI types prescribed by education policy is still largely fulfilled. The academic profile at universities thus has a stronger academic background and is more involved in research, while lecturers at universities of applied sciences and teacher education have more practical experience (Baumann, 2022; Baumann & Leišytė, 2022; Böckelmann et al., 2022).

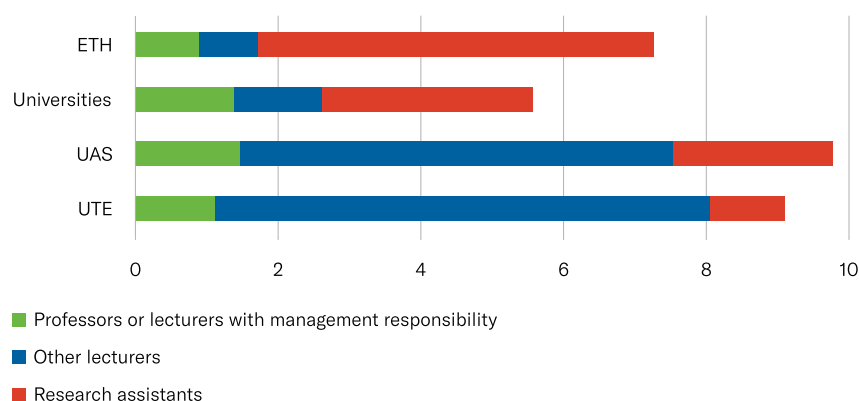
As a result of the lower research orientation of non-university HEIs (universities of applied sciences and universities of teacher education), compared to universities, the latter are less research-oriented, they also recruit fewer assistants and research associates. In addition, UASs and UTEs are not in a position to award doctoral degrees to their graduates. This requires cooperations with universities in Switzerland and abroad. Swissuniversities supports appropriate cooperation projects with universities in Switzerland and abroad on the basis of the Federal Act on the Funding and Coordination of the Higher Education Sector. This practice appears to be fundamentally successful. The third funding period in this regard (2025–2028) is currently underway.

The types of HEI differ both in terms of the weighting of the different performance types as well as in terms of the staff categories within the performance types. While assistants and research associates at universities also make up the largest proportion of teaching staff, lecturers are predominantly employed at non-university higher education institutions. At the Swiss federal institutes of technology, the share of assistants and research associates is even higher than at cantonal universities, which means that the supervision factor here is much better than at the universities (→ Figure 202).

202 Personnel resources in teaching, 2023

Academic teaching staff (including advanced education) in FTEs per 100 students

Data: FSO; calculations: SCCRE



In recent years, the personnel structures of the types of higher education institution have converged: The relative share of academic management staff at universities of applied sciences and teacher education (lecturers with management responsibilities) now corresponds more closely to that of universities (professors).

While the large group of assistants at federal institutes of technology means a good supervision factor, the high proportion of lecturers at UAS and UTEs has the same effect.

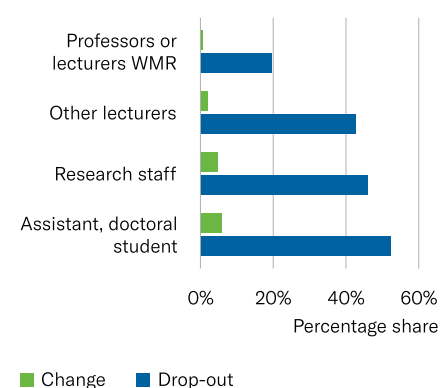
Changes in academic staff between types of HEI are quite rare. Over the last five years, on average, only a good 3% of academic staff have changed the type of HEI. At 6%, the change rates of the non-professional teaching staff, who are usually employed on a temporary basis, are almost twice as high. One-third of assistants or research associates at universities who change HEI type do so in conjunction with advancement in the staff category. However, leaving the higher education system as a whole is much more common than switching between types of HEI (→ Figure 203).

The types of HEI also differ in terms of the geographical origin of the academic staff. Generally speaking, the share of foreign nationals among academic staff and students is a measure of the appeal of a university. In the meantime, more than 50% of the teaching staff at the universities is made up of professors and assistants of foreign nationality. This share is significantly lower at universities of applied sciences and universities of teacher education (→ Figure 204). The relatively high proportion of foreign nationals, both among lecturers and among students, speaks to the high appeal of the Swiss higher education sector.

203 Mobility of university staff

Changes in academic staff between HEI types by staff category over the last five years (2019–2023)

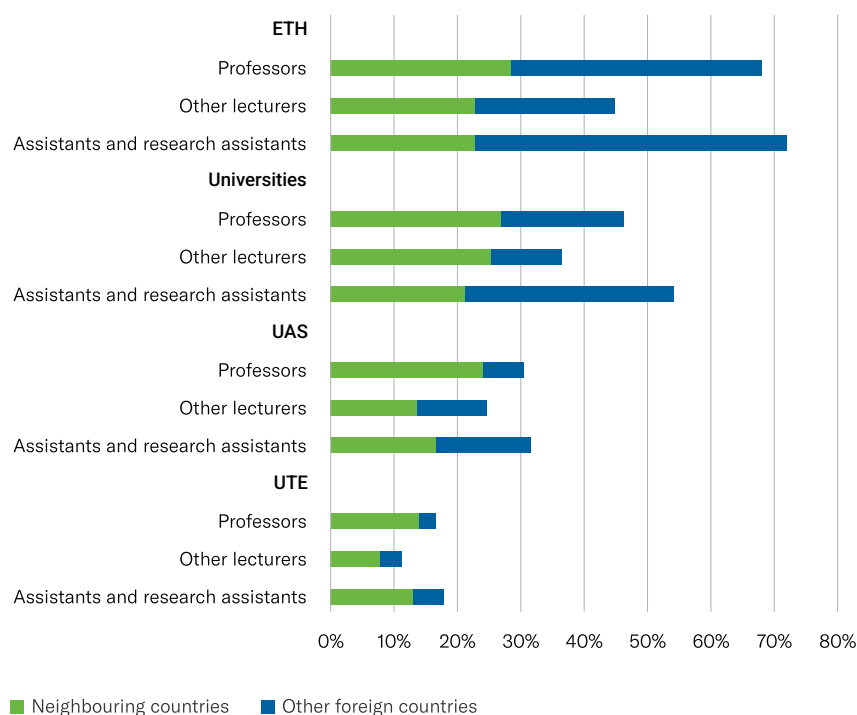
Data: FSO (SHIS-PERS); calculations: SCCRE



WMR With management responsibility

204 Academic staff by nationality, 2023

Data: FSO (SHIS-PERS); calculations: SCCRE



According to various studies, the local higher education institutions have in the past been quite successful in recruiting highly qualified foreign academics for teaching and research (*Lepori et al., 2015*). However, these studies generally cover the period prior to the exclusion of researchers working at Swiss higher education institutions from the most important European research programmes.

The quality of the university location as well as its ability to recruit the best academic talent are highly interdependent. According to empirical studies, the high degree of internationalisation among research personnel has a positive effect on scientific output (*Seeber et al., 2023*) and thus on the quality of the location, which in turn is decisive for its appeal as a place of work for the best academic talents.

Switzerland's suspended association with Horizon Europe – a framework programme for research and innovation of the European Union (EU) – was associated with greater uncertainty for researchers in Switzerland regarding research funding and cooperations, which has a negative impact on the position of Swiss higher education institutions in the competition for foreign academic staff. However, the consequences of non-participation in the European framework programme Horizon Europe have varying consequences for individual countries (*Cavallaro & Lepori, 2021*). Until re-association, which is planned for 2027, the federal government will pay for the participation of stakeholders from research, regardless of their participation status.

Funding of higher education

HEIs are financed from a range of sources by the federal government, cantons, and private individuals. While the sources of such funding potentially increase resources, they also make it difficult to manage the system of HEIs in a uniform manner. Except in the case of the federal institutes of technology (ETH), HEIs are in the remit of the cantons, which also bear the main burden of funding, with a share of over 50%. The ETHs, on the other hand, are funded by the federal government through lump-sum contributions. As with the funding of the cantonal universities, the basic financing of the universities of applied sciences and the universities of teacher education is also provided by the sponsoring cantons. In addition, there are inter-cantonal university contributions, and the UASs and HEIs receive basic contributions from the federal government.

The federal government contributes to the operating expenses of the two types of HEI mentioned. At the request of the Federal Council, the Swiss parliament approves the basic contribution amount for four-year periods. Reference costs, which are based on the average cost per person and subject, serve as a basis for the assessment. 20% of the of the operating costs are earmarked for universities and 30% for universities of applied sciences. The total of the basic contributions is allocated per HEI type, whereby different rates apply when allocating amounts for teaching and research. Funds for the universities are distributed as follows: 70% for teaching and 30% for research. At the universities of applied sciences, the share is 85% for teaching and 15% for research². The distribution of funds among the

2 Art.7 of the Federal Act on the Funding and Coordination of the Higher Education Sector

higher education institutions relies on performance-based assessment criteria, whereby the different university profiles are considered. The performance of a HEI is thus compared with that of all other HEIs within the same HEI type and placed in competition. Assessment of funding based on performance in teaching draws on data such as the number of students and the degrees awarded. Moreover, the federal government provides funding by means of construction grants and project-specific grants. The latter are used to promote joint projects among higher education institutions that are significant for all of Switzerland. The cantons' contributions are assessed per capita: Based on the Intercantonal University Agreement (IUV)³ or the Intercantonal Agreement on Universities of Applied Sciences (UAS)⁴, the cantons pay fixed per capita contributions for cantonal residents who study at a higher education institution outside their canton of origin (→ *chapter Universities, page 211*; → *chapter Universities of applied sciences, page 243*). Financing in the sector of higher education institutions based on the principle of demand-oriented basic funding of HEI – measured by student numbers – tends to create incentives to expand the number of courses offered. This applies in particular to universities of applied sciences, also because they have a higher cost ratio for teaching compared to conventional universities (*Lepori & Jongbloed, 2018*).

Around one-third of public spending on education goes to higher education. Of the approximately CHF 13 billion spent on higher education institutions in 2023, the federal government (including the Swiss National Science Foundation) and the cantons each contributed around 40% (→ Figure 205). The remainder comes from private sources (tuition fees, private research commissions, contributions from foundations and sponsoring). Of the federal government's share, more than half of the federal share went to the two federal institutes of technology, of which 86% of the total expenses are borne by the federal government. On average, the universities of teacher education have a similarly high share from one source of funding; 83% of these costs are borne by the cantons. Total expenditure in the tertiary sector in Switzerland is relatively high in absolute terms. When seen in relation to GDP, it is in line with a share of 1.3%, only in the upper mid-range of industrialised countries (→ Figure 206). Making such a comparison, however, requires considering the fact that some countries have higher tertiary education rates, resulting in higher GDP shares. The ratio of total expenditure to GDP is therefore of only limited use in country comparisons.

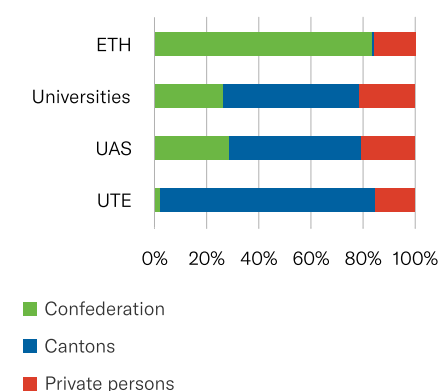
Scholarships

In Switzerland, education at higher education institutions and professional education institutions is predominantly publicly funded, while preparation for (advanced) professional examinations is predominantly privately funded. However, studying is associated with high private costs for all students, not least due to loss of earnings, which could lead to people from lower-income households deciding not to study for financial reasons. In addition,

205 Funding of HEIs by source, 2023

Share of expenses by donor

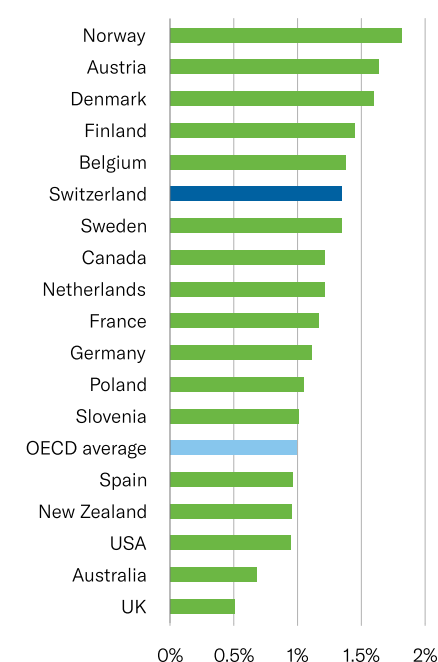
Data: FSO



206 Total expenditure in tertiary education, relative to GDP, 2020

Expenditure as a percentage of GDP

Data: OECD; calculations: SCCRE



³ Intercantonal agreement on the contributions to the education costs of universities (Intercantonal University Agreement, IUV) of 27 June 2019.

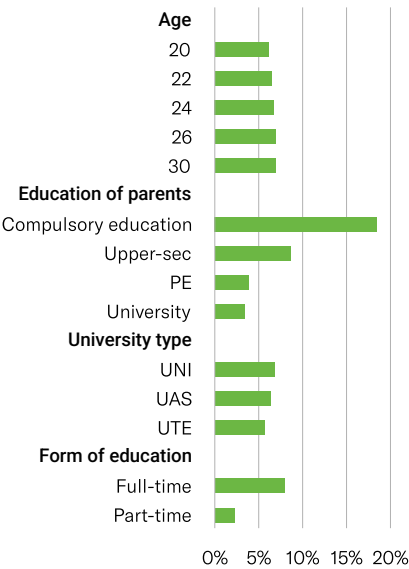
⁴ Intercantonal University of Applied Sciences Agreement of 12 June 2003.

The cantons are responsible for **awarding scholarships**. Based on their respective scholarship law, they decide who receives how much training subsidy. Since 2013, a Concordat has been in force to determine the rules and minimum standards for awarding training contributions. Cantons that do not meet the Concordat's provisions for tertiary-level education are not entitled to federal contributions. The Concordat, which 22 cantons have signed, only regulates minimum standards. The rates of scholarship recipients and the amounts of the contributions therefore continue to vary greatly between the cantons (FSO, 2024n).

207 Share of scholarships by age, education of parents, type of higher education institution and form of education

Share of Bachelor's students residing in Switzerland before starting their studies who receive a public scholarship

Data: FSO (SSEE 2024); calculations: SCCRE



students who receive little or no financial support from their family may be more likely to find themselves forced to take up employment while studying (FSO, 2021a). The multiple workloads could prolong studies or impair academic performance – and, in the worst case, lead to students dropping out of studies.

In order to counteract such effects, scholarships or student loans are provided in Switzerland, as in most other countries. The majority of international evidence suggests that scholarships and other financial support can help to positively influence the study decisions of economically disadvantaged persons (de Gendre & Kabátek, 2021; Engelhardt & Lörz, 2021; Martini et al., 2021). Furthermore, It has been shown that financial study aids can shorten the duration of studies and reduce the risk of dropping out (Angrist et al, 2022; Bettinger et al., 2019; Graziosi et al., 2021; Nguyen et al., 2019; Rattini, 2023). The results of a meta-analysis (Nguyen et al., 2019) also suggest that scholarship programmes that are linked to non-financial support measures such as proactive counselling or learning support are more conducive to academic success.

International comparisons with Switzerland are only of limited use, because such studies consider education systems that differ greatly from the situation here, for example with regard to tuition fees borne by the private sector or in terms of university admission procedures. The impact of scholarships on the admission and course of studies in Switzerland has not yet been studied. However, survey results indicate that scholarship recipients work less often or for fewer hours, which potentially leaves them with more time for their studies (FSO, 2021a). Of those who dropped out of a study programme, only 12% cited financial problems as one of the reasons for their decision; 4% of those surveyed cited the rejection of the grant application as the reason for dropping out (FSO, 2021a).

The average scholarship for tertiary-level education students in 2023 was around CHF 9,100 per year (FSO, 2024n). While the amount of scholarship contributions and the number of recipients remained largely stable between 2017 and 2022, there was a significant drop in the number of scholarship recipients in 2022 (–6% compared with the previous year). Due to the rising number of students, the rate of scholarship recipients – the number of recipients in relation to the number of persons in education – has also fallen steadily in recent years. The absence of statistics on the income and financial circumstances of (potential) students and their parents, combined with the limited transparency regarding the criteria for awarding scholarships, make it impossible to determine the reasons for the significant decline in the scholarship rate. However, survey results show that the share of students who submitted a grant application fell significantly between 2005 and 2020 (FSO, 2021a). One explanation for the relative decline in scholarship applications could be that many cantons now provide scholarship calculators on their websites, which make it easier to estimate the chances of obtaining a scholarship before submitting an application.

As expected, the probability of receiving a public grant is highly dependent on the education level of the parents (→ Figure 207), as this correlates with the family income. Students whose parents do not have a post-compulsory education qualification are much more likely to receive a grant than those whose parents have a tertiary education qualification. However, some students also receive a scholarship even though their parents have a tertiary

education. This indicates that even parents with a high level of education may have limited income and assets. As expected, the scholarship rate for full-time students is higher than for part-time students. On the other hand, there are no notable differences between the types of HEI and the age of the students.

Admissions to HEIs and professional education

Admission to a tertiary-level education requires an upper-secondary-level qualification, whereby admissions to professional education generally also require a certain number of years of practical experience, and admissions to a university also require a baccalaureate or equivalent previous education (cf. Higher Education Act). For universities, the primary admission path is via the baccalaureate, for universities of teacher education it is via the baccalaureate or specialised baccalaureate with an educational focus. Admission to a university of applied sciences requires a federal vocational baccalaureate in combination with an apprenticeship related to the field of study or a specialised baccalaureate with a field of study related to the study course. In addition to these admission routes, however, other options also exist for admission to the HEIs, which ensure that students can switch among programme types. Alternative admission types usually require an additional prior qualification. For example, admission to a university requires the applicant to have completed a vocational or specialised baccalaureate and pass a supplementary exam (“federal vocational baccalaureate – universities” or “specialised baccalaureate – universities”), while admission to a UAS with a baccalaureate generally requires one year of work experience (cf. UAS Admission Ordinance⁵). However, there are repeated calls for a further opening of the transitions, for example with reference to the shortage of skilled workers or social inequalities.

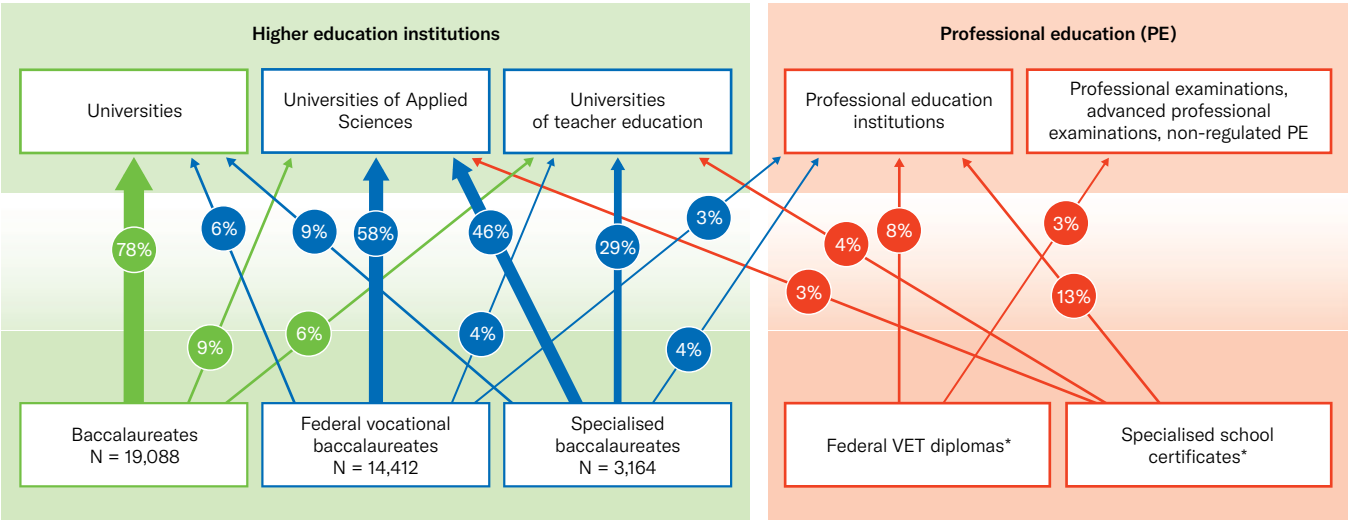
Despite the existing structural permeability, the current transition rates of baccalaureate students to the various types of HEI confirm that the majority of students enter a university via the regular admission system (→ Figure 208). The types of baccalaureate also differ in terms of transition rates to a tertiary-level qualification. This is highest among baccalaureate students (93% up to two years after graduation) and lowest among holders of a vocational baccalaureate (68%). Overall, it can be said that the transitions to higher education institutions work well and that the university-specific admission requirements and requirements of the various types of higher education institution are well coordinated (Eberle, 2025).

Of those who have acquired a federal VET diploma and have not started a federal vocational baccalaureate, only 11% transition to professional education in the first two years. The fact that the share of transitions to education leading to professional education and federal examinations is so low is due to the fact that the latter can usually only be completed after several years of professional experience (→ *chapter Professional education, page 303*). Eight years after graduation with a federal VET Diploma, the rate of transitions to tertiary-level professional education is 32% (2014 graduation cohort, excluding persons who subsequently obtained a federal vocational baccalaureate).

5 Ordinance of the University Council on Admission to UAS and UAS institutes of 20 May 2021.

208 Transitions to higher education institutions and PE

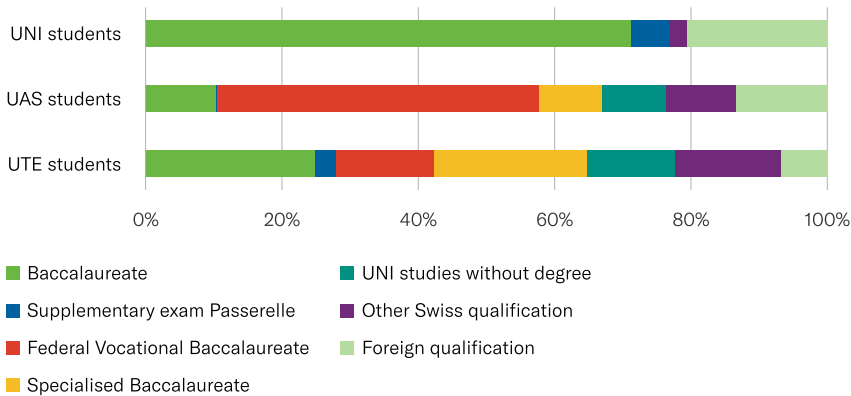
Transfers of graduate cohorts in 2020 up to two years after graduation from upper secondary level; transition rates of less than 3% are not shown
Data: FSO (LABB); calculations: SCCRE



With regard to the admission qualifications of Bachelor’s students, the baccalaureate is confirmed as the main feeder to the universities and the federal vocational baccalaureate as the main feeder to the universities of applied sciences, while the student body of the universities of teacher education is fairly heterogeneous in terms of access diplomas (→ Figure 209).

209 Admission certificates for Bachelor’s students by HEI type, 2023

Students starting at an HEI of the respective type for the first time
Data: FSO (LABB); calculations: SCCRE



Transfers and accessibility among HEI types

The modularisation of degree programmes under the Bologna system has made it easier to switch between higher education institutions and types of higher education institutions. This proves to be especially useful to those looking to switch from a Bachelor's to a Master's programme. Transfer to a different higher education institution type is possible within a specialised field, in which case the student must complete a maximum of 60 additional credits (CRUS *et al.*, 2010). In addition, in the case of Bachelor degrees obtained at a higher education institution of a different type, the HEIs may impose minimum quality requirements on the curricula and content of studies as well as a minimum grade. Within one HEI type, all Bachelor's graduates of the relevant field of study can attend consecutive Master's degree programmes without having to meet any additional requirements.⁶ For admission to specialised Master's programmes, on the other hand, higher education institutions can require additional knowledge and skills.

Although the access routes to Master's level have been increasingly standardised and the permeability between HEI types has been increased (Quiring, 2023), the share of Bachelor's graduates taking up a Master's degree at a HEI of another type is low (→ Figure 210). The highest permeability is found between UAS Bachelor's and UNI Master's at 18%. Comparatively little use is also being made of the opportunity to change university within the same type of university.

The **Bologna system** structures higher education into three cycles:

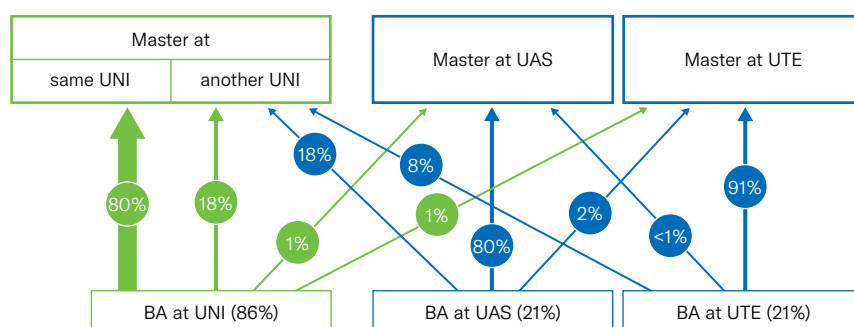
- 1st cycle: Bachelor
- 2nd cycle: Master
- 3rd cycle: Doctorate (PhD)

Previously legally valid university qualifications at the Licentiate and Diploma levels correspond to the 2nd cycle. Doctorate degrees can only be obtained at UNIs. However, cooperation arrangements (jointly managed doctoral programmes) exist between the UASs or UTEs and the UNIs (→ *chapter Universities of applied sciences*, page 243).

210 Rate of transfer to Master's level

Up to 2 years after completion BA, 2021; overall transition rate and distribution of Master's transitions by type of higher education institution at the Master's level

Data: FSO (LABB); calculations: SCCRE



Transitions to a Master's degree program after a Bachelor's degree at a UTE

Unlike in the case of teacher training for the primary levels, the training of lower-secondary level teachers requires a Master's degree for professional qualification, which is reflected in the transition rates (lower-secondary: 100%, primary level: 10%). For Bachelor's graduates in the field of lower-secondary education, 99% of the Master's degree program is at a UTE. Different transition rates depending on the field of study can also be found in the degree programme offered by the universities of applied sciences (→ *chapter Universities of applied sciences*, page 243).

International mobility

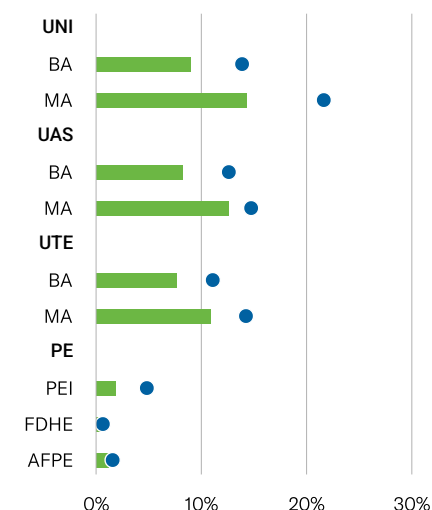
International exchange and cooperation activities promote the quality and competitiveness of institutions as well as the skills of both students and researchers. The EU's education and research programmes, such as Erasmus+ and Horizon Europe, are of particular importance for Switzerland due to the close economic and cultural ties with Europe. From 2014, however, Switzerland was only able to participate in the programmes with the

⁶ University Council Ordinance on the Coordination of Teaching at Swiss Higher Education Institutions of 29 November 2019.

211 Mobility rates by HEI type and level of study

Share of persons who completed at least one semester of study or an internship of at least three months (or 15 ECTS credits) abroad; graduation cohorts 2022 and 2018, excluding foreign-educated students

Data: FSO (EHA, eHBB); calculations: SCCRE



■ Graduation cohort 2022

● Graduation cohort 2018

BA Bachelor

MA Master

PEI Professional education institution (Diploma)

FDHE Federal Diploma of Higher Education

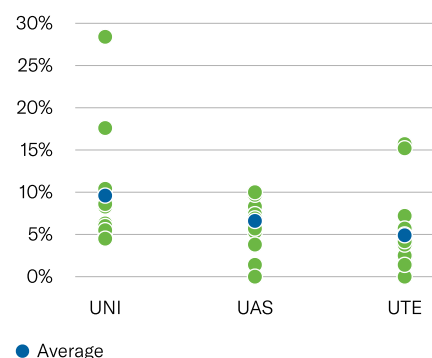
AFPE Advanced Federal Professional Examination (Federal Diploma)

For methodological reasons, the PE also includes shorter stays abroad.

212 Mobility rates by HEI type and institution

Share of persons who completed at least one semester of study or an internship of at least three months (or 15 ECTS credits) abroad; BA and MA graduation cohorts 2022, excluding foreign-educated students, only higher education institutions with at least 50 observations

Data: FSO (EHA); calculations: SCCRE



● Average

status of a third country. Thanks to transitional regulations, applications for tenders from the European Research Council (ERC) were once again submitted for the Horizon package in 2024 and 2025. From the programme year 2025, Switzerland will once again be able to participate in almost all Horizon Europe tenders. Since 2014, student mobility has been supported by the federal government as part of the interim solution Swiss-European Mobility Programme (SEMP) through the direct financing of outgoing and incoming mobility.⁷ Compared to full association, however, mobility is associated with higher organisational hurdles. In addition, strategic partnerships and cooperation projects as well as political participation remain significantly reduced, and in some cases have become impossible altogether. As of 2022, however, Switzerland has been able to participate in the “European higher education institutions” initiative, which promotes cross-border institutional cooperation projects in teaching, research, innovation and services. Twelve Swiss higher education institutions are now involved in such alliances: 58% of universities, 50% of universities of applied sciences and one university of teacher education that is integrated into a participating university of applied sciences (as of July 2025). Re-participation in Erasmus+ is planned from 2027.

Switzerland has committed itself to the goal of at least 20% of graduates of tertiary-level qualifications completing a study or internship abroad for at least three months or 15 ECTS credits. The quota is to be increased to 23% by 2030. However, an exact target check is not possible based on the available data. Although the surveys conducted by the “Graduate Studies at Higher Education Institutions” (EHA) provide information on how many students have completed an exchange semester in a given study cycle, they do not indicate how many students have been abroad once during their entire studies. The evaluation of this data suggests that the 20% target will only be achieved at universities – or at least in the period before the COVID-19 pandemic (→ Figure 211). Exchange activities declined significantly during the COVID-19 pandemic. The share of persons who spent at least one semester of study of at least three months (or 15 ECTS credits) abroad or completed a three-month internship outside Switzerland fell by one-third compared to the 2018 graduation cohort. Irrespective of the pandemic, the mobility rate varies between HEI types and is higher at Master’s level than at Bachelor’s level. In contrast, international mobility is not widespread among vocational and professional education and training graduates. This can largely be explained by the fact that there is practically no comparable education abroad and the education is usually part-time.

If we look at the mobility rates of the individual institutions for the different types of HEIs, we can see that there is also a great deal of variance (→ Figure 212). In the years leading up to the COVID-19 pandemic, the differences were even greater. The wide range suggests that higher education institutions can definitely promote international mobility. Examples of higher education institutions with comparatively high mobility rates are the University of St. Gallen, ETH Lausanne (EPFL) and the university of teacher education in St. Gallen. Generally speaking, it appears that a strong internationalisation of degree programmes – in other words, English-language degree programmes, global or intercultural courses – and an international

7 Outbound mobility: Swiss students studying abroad; inbound mobility: Foreign students studying at a Swiss university.

composition of students and lecturers, or collaboration with foreign partner universities can promote foreign mobility (*Movetia, 2023*). At individual level, students with parents who do not have a tertiary education are less likely to take part in exchange programmes than those whose parents have completed a tertiary qualification. This is due to the fact that, despite financial support from the state, such exchanges always require considerable private investment.

Demand for part-time programmes

Part-time degree programmes offer the opportunity to complete a course of study to persons who are already working, have to earn their own living, have family responsibilities or for other reasons cannot or do not want to complete full-time studies.

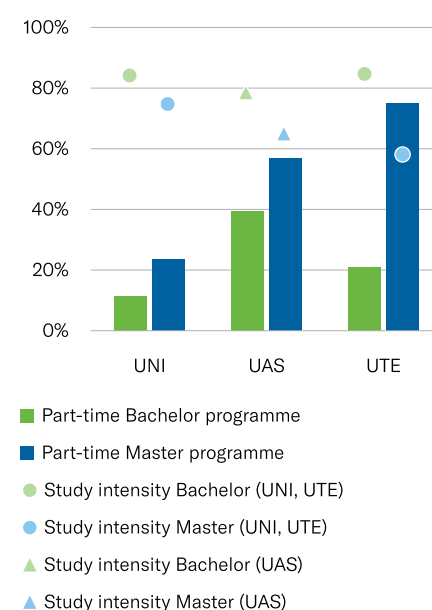
The amount of time spent by university students in gainful employment as well as home and family work – on average ten hours per week for gainful employment and six hours for home and family work (*FSO, 2025f*) – indicates the need to be able to complete degree programmes part-time or at least more flexibly. In particular, some universities of applied sciences and universities of teacher education explicitly offer part-time courses of study. Although no separate degree programmes exist for part-time students at other higher education institutions, it is possible to structure the degree programme flexibly to a certain extent. A third group of higher education institutions require continuous attendance due to their highly structured degree programmes.

Considering the share of students who state that they are studying part-time, there are substantial differences between HEI types and levels of study (→ Figure 213). Two to three times as many students at universities of applied sciences attend Bachelor's degree programmes part-time than at universities or universities of teacher education. The greater prevalence of part-time courses at universities of applied sciences has a historical background. The part-time study programmes for gainfully employed persons had a long tradition in previous schools. Based on administrative data, the figures on average study intensity, expressed as a percentage of a full-time course of study, show that this is around 85% at universities and universities of teacher education at Bachelor's level. At universities of applied sciences, where the study intensity is not calculated (as at universities and universities of teacher education) based on the number of credits evaluated, but rather based on the number of credits registered, it is 79%. As the survey methods are different, the figures cannot be directly compared. However, they may indicate that the average study intensity between HEI types may not differ as much as would be expected based on the (subjectively measured) shares of part-time students. One possible explanation for this is that “full-time students” at universities and universities of teacher education have a lower degree of study intensity than those at universities of applied sciences. The extent to which this could be due to institutional reasons cannot be answered based on the available data, nor can the question of whether students are reducing their workload in order to have more time for gainful employment, leisure time or studies. However, data from the “Social and Economic Situation of Students” (SSEE) survey shows that 40% of those who say they are studying part-time justify this by saying that they do

213 Share of students studying part-time

According to students (2024) and average study intensity according to administrative data (2022/23)

Data: FSO (SSEE, ASBOS), SERI (UAS financial reporting); calculations: SCCRE



Study intensity is defined as 100% if students attend courses worth 60 ECTS credits per academic year or have the corresponding grades evaluated.

Study intensity at UNI and UTE: For UNIs and UTEs, the calculation of study intensity is based on the number of credits evaluated (according to ASBOS).

Study intensity at UAS: For UASs, the calculation of study intensity is based on the number of credits registered (according to UAS reporting).

not have the financial means to study full-time. A quarter of them cited the reason for taking part-time studies as being that course content and practical work could be directly linked and that part-time studies corresponded better to people's ideas about how to organise their lives.

According to the comparison between the study levels, part-time students are much more strongly represented at Master's level than at Bachelor's level, and the study intensity is also lower. This can be explained by Master's programmes being less structured and Master's students already having a qualification that gives them easier access to a job within their field. However, the share of work-study Master's students at universities of teacher education is strikingly high; these are mainly students in the lower-secondary level degree programme. In this field of study, the Master's degree is considered the standard qualification and the Bachelor's degree – unlike teacher training at primary school level or most degree programmes at universities of applied sciences – is not yet a professional qualification. The fact that considerably more Master's students are nevertheless gainfully employed can probably be explained by the severe shortage of teachers. There is no information about how extensive employment during studies affects the graduation rate, the duration of studies, or the quality of the degree. In theory, both positive and negative effects are conceivable.

The option of part-time studies differs not only by HEI type, but also by field of study and language region (*FSO, 2020b*). At universities, part-time courses are most common in the humanities and social sciences, and least common in the technical sciences and medicine. At universities of applied sciences, the largest shares of part-time students are found in the fields of business and services, social work, engineering and IT, and applied psychology. In general, it appears that part-time studies are less common in French-speaking Switzerland than in German-speaking Switzerland.

Labour market opportunities

The **employment rate** is defined as the share of all graduates in employment. In 2021, there was a break in the time series due to the questionnaire being revised. From 2021 onwards, all persons who worked at least one hour for pay during the reference week, worked in a family business without pay or had a job even though they were absent from work were defined as gainfully employed. This definition applies to PE graduates from 2017. In the case of university graduates from 1981–2019, those who answered yes to the question of employment are considered to be in employment. Persons in a Regional Employment Agency (RAV) employment programme were not considered to be employed.

Over the past 20 years, between 84% and 97% of tertiary-level graduates were in employment one year after completing their qualification, with the share varying according to the type of education and economic situation (→ Figure 214). Overall, the employment rate has increased over time. However, the latest increase in 2021 is also likely to be related to the change in the recording or adapted definition of gainful employment (→ *margin text*).

Graduates of universities of teacher education and professional education have the highest employment rates. The lowest rate is among graduates from conventional universities. One explanation for the fact that the latter tend to be unemployed more often than graduates of universities of applied sciences might be, on the one hand, that the degree programmes at universities of applied sciences prepare students for specific professions. On the other hand, many graduates from universities of applied sciences have basic vocational education training and thus, on average, more professional experience, making it easier for them to enter the labour market (*Oswald-Egg & Renold, 2021*). In recent years, however, the gap in the employment rate between universities of applied sciences and universities has narrowed significantly.

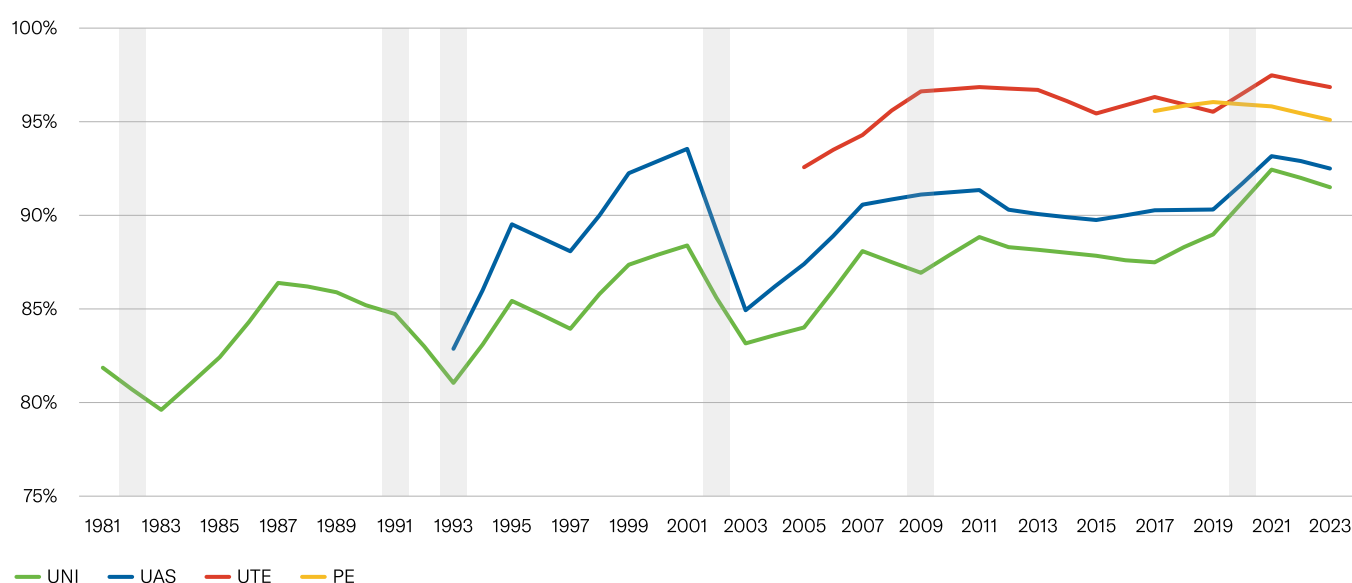
The labour market opportunities, which vary by education type, are still apparent five years after graduation from university (or four years after graduation from professional education), in accordance with the graduates'

survey (EHA or eHBB). Graduates of universities of teacher education and professional education have the highest employment rates, although the gap to universities of applied sciences and universities is smaller compared to one year after graduation. The extent to which the inactivity is an involuntary choice cannot be conclusively clarified based on the available data. However, the unemployment rate and the employment rate correlate inversely.

214 Employment rate of tertiary degree holders, 1981–2023

1 year after graduation; UNI: only graduates of the 2nd cycle (licentiate, diploma, Master); UAS/UTE: Graduates of the 1st cycle (Bachelor, diploma), if they have not started a Master's at the time of the survey, as well as graduates of the 2nd cycle; grey bars: years with negative economic growth; year 2021: revision of the survey questions/redefinition of "employment rate"

Data: FSO (EHA, eHBB), SECO; calculations: SCORE



International comparison of education quality

Comparing the quality of tertiary education internationally raises the question of which standards should or can be used. Here, university rankings are the best option, in the absence of better alternatives. These can be critically questioned as a measure of quality for individual higher education institutions or in general, for example because the evaluations depend heavily on the quantitative output of research achievements and not significantly on the quality of teaching, while not sufficiently taking account of the different academic cultures. Nevertheless, ranking lists have real significance for higher education institutions. They are not only taken into account by employers, but also influence students in their choice of university (Koenings *et al.*, 2020). Finally, the universities themselves post their ratings on their websites, which indicates a certain level of acceptance.

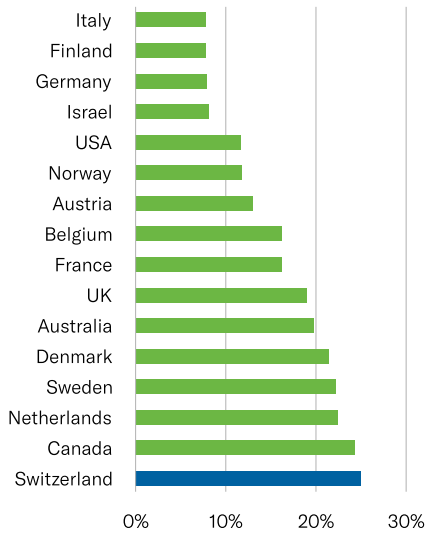
In order to enable the most meaningful comparison possible between countries, the share of students at ISCED level 6 (Bachelor's degree or equivalent) who attend one of the world's top 200 higher education institutions in their country – according to the Shanghai ranking – will be considered below (→ Figure 215). With this indicator, however, a country's performance depends not only on the measured quality or output of its tertiary

With the **evaluation criteria** used in standard university rankings, only UNIs in Switzerland have a chance of being rated very well. In the Shanghai Ranking (Academic Ranking of World Universities), seven Swiss universities have been ranked among the top 200 universities for several years. In terms of Bachelor students at universities, almost 80% of students are enrolled at one of the 200 best universities.

215 Share of students at a top 200 university, 2024

According to Shanghai Ranking 2024; ISCED level 6 students only

Data: Internet research SCCRE, UNESCO; calculations: SCCRE



education system but also on the design of the tertiary programmes. In addition, the indicator also depends on whether the way in which the number of students at universities is measured corresponds to the method of recording of the total number of students in a country. The indicator “Share of students at a top university” can therefore only approximate the quality or effectiveness of the tertiary education system. Switzerland has been at the top of the list since this indicator was calculated. According to the evaluation method used, around a quarter of students attend one of the 200 best-ranked higher education institutions here – twice as many as in the USA, the country with the most top universities.

Social disparity

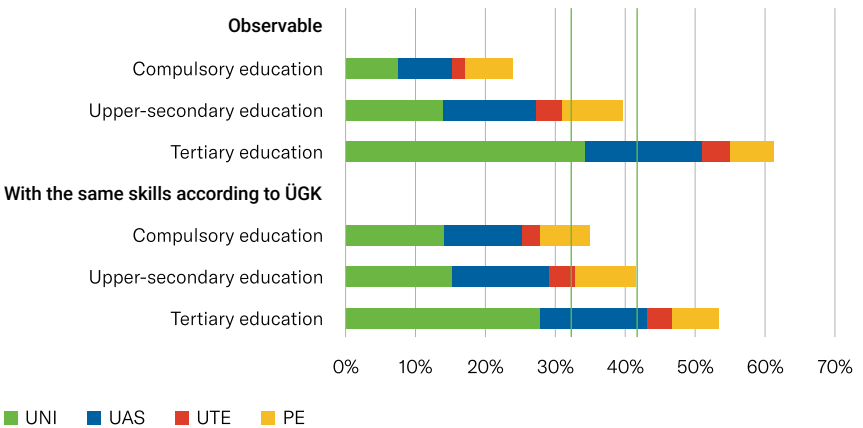
In Switzerland, as in most other countries, access to higher education institutions is related to social background (*Goastellec, 2022*). Children from academic families are much more likely to enter and successfully complete a higher education programme than those whose parents did not study (*Buchmann et al., 2016; Combet & Oesch, 2021; Zimmermann & Seiler, 2019*). Of those whose parents have a university degree, 55% go to a university (→ Figure 216). The figure is only 17% for persons whose parents have not completed post-compulsory education and 31% for persons whose parents have completed upper-secondary education. There are significantly greater disparities in access to universities than in access to UASs and UTEs. The different entry rates can largely be explained by the different skills at the end of compulsory education. With the same level of performance (according to the review of the national education objectives [ÜGK] 2016), they are only half as large. Disparities in access to universities are narrowing the most. The remaining differences can largely be explained by the level of requirements at lower-secondary level as well as the type of education attended at upper-secondary level, in other words, access to baccalaureate schools.

216 Admission rate to tertiary education by parents' highest level of education

Education type upon first admission to a tertiary education (including PE examinations); persons who took part in the ÜGK survey in 2016 and have been living in Switzerland continuously since 2015

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE

In a period of seven years after graduation from compulsory education, 38% have started a university qualification and 46% have started a tertiary-level qualification (green lines).



Professional education plays a special role in terms of access to tertiary education. Unlike access to higher education institutions, children whose parents have not completed post-compulsory education are barely underrepresented; children whose parents have a university degree are represented below the average. Professional education therefore has a balancing effect on disparities in access to tertiary education.

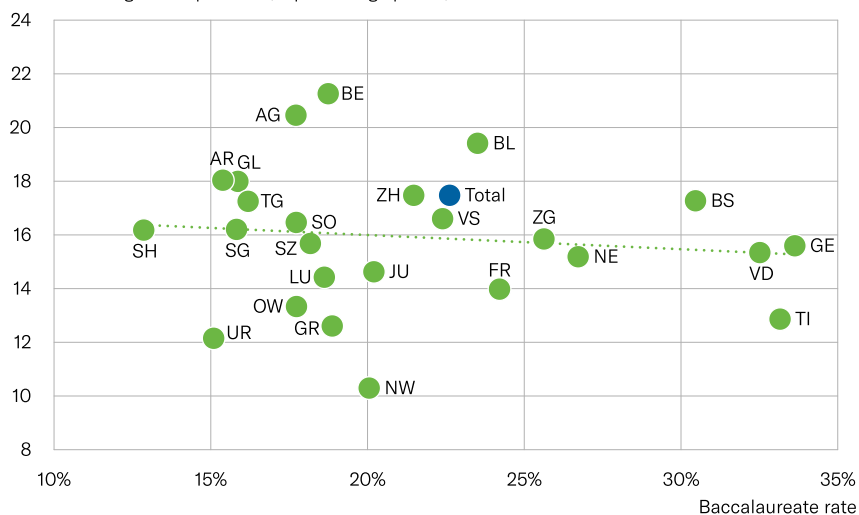
In view of the fact that the type of education attended at upper-secondary level has a decisive influence on whether someone later embarks on a higher education course, the question arises as to whether a higher baccalaureate rate leads to a reduction in social disparities. However, a comparison of baccalaureate rates and disparities in access to higher education between the cantons reveals no dampening effect of a higher baccalaureate rate ($\rightarrow$ Figure 217). There is no statistically significant correlation between social selectivity in access to higher education and the level of the (academic) baccalaureate rate. Neither does a link exist between the overall baccalaureate rate and social disparity in access to higher education. This may be explained by the fact that, with a higher baccalaureate rate, not only more children from disadvantaged families, but also more children from parents with a tertiary qualification attend a baccalaureate school.

217 Baccalaureate rate and social selectivity in access to higher education

Difference between the higher education entry rate of persons with parents who have a tertiary qualification and the corresponding rate of the overall sample; canton of residence at the time of the ÜGK survey; only persons who have been resident in Switzerland continuously since 2015; canton AI is not shown due to the small number of cases

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE

Difference in university admission rate between persons with parents with a tertiary qualification and the average of all persons (in percentage points)

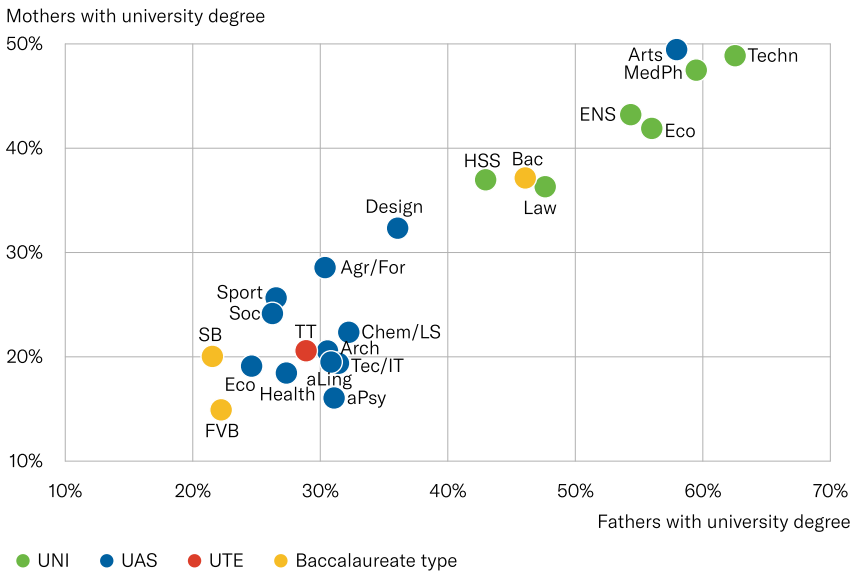


However, major differences by educational background exist, not only in the choice of HEI type, but also in the choice of field of study within a HEI type (→ Figure 218). Although the fields of study of the universities consistently have higher shares of students whose parents have a university degree, the difference in social origin between the students of the different fields of study is almost as great as between the students of the universities and the universities of applied sciences and teacher education. One special case is the field of study of the arts, which is offered at the universities of applied sciences. However, the student population there is comparable to that of universities, which can be explained in part by the fact that a large proportion of these students have a baccalaureate.

218 Education backgrounds of university students by fields of study, 2024

Bachelor's students residing in Switzerland before starting their studies

Data: FSO (SSEE), EDK (ÜGK 2016); calculations: SCCRE



Demand for tertiary education

Technological change in developed countries is increasing demand for a highly educated workforce. The sharp expansion of the tertiary sector that has been observed in Switzerland over the past 20 years reflects both the increased demand for highly qualified workers and the increased willingness of the population to spend more time in education. As long as the supply of persons with tertiary education grows at the same rate as the demand for persons with tertiary education, this increase will not lead to a decline in the wage advantage of persons with tertiary education (Acemoglu, 2002; Freeman et al., 1986).

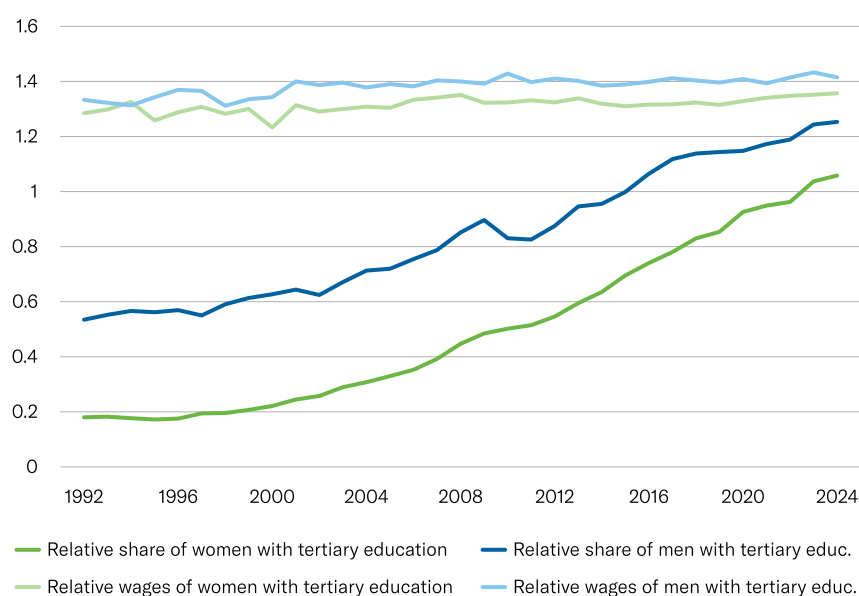
Based on data from the Swiss Labour Force Survey (SLFS), this development can be shown for the last three decades (→ Figure 219). While the ratio between persons with a tertiary-level qualification and persons whose highest educational qualification is post-compulsory education has more than doubled, the relative wage advantage of those with a tertiary-level

qualification has remained constant at around 1.4; this corresponds to an average of 40% more salary in each year of employment over the entire employment career. Supply and demand for tertiary-educated persons cannot simply be controlled by the state. It must therefore be assumed that, on the one hand, the labour market was able to well absorb the significant increase in such persons and, on the other hand, that young adults were guided by the signals of the labour market in their educational decisions.

219 Relative share and salary advantage of tertiary-educated persons, 1991–2024

Ratio between the shares of persons with a tertiary education and the share of persons with an upper-secondary education as the highest level of education (25–64 year olds); or median salary of persons with a tertiary education relative to the median salary of persons with an upper-secondary education as the highest level of education

Data FSO (SLFS); calculations: SCCRE



Reading example

In 2000, around two out of every three men with tertiary education completed upper-secondary education; today, there are five people with tertiary education for every four people with an upper-secondary education. While the ratio in the level of education of the population has almost reversed (tertiary-educated persons now constitute the majority of the population), the wage advantage of men with tertiary-educated education has remained practically constant at around 40%.

Over the past 30 years, both men and women with a tertiary education have enjoyed a constant wage advantage. The ongoing expansion of education was accompanied by a sharp increase in demand for highly-skilled workers of both genders.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

**CONTINUING EDUCATION
AND TRAINING**

UNIVERSITIES

Context

Unless otherwise specified, the term **“students”** used in this chapter includes all students at Bachelor’s, Master’s, licentiate and diploma levels, but does not include students at Doctorate or continuing education level.

Teaching is part of the core mission of the universities. The number of students and their choice of field of study are therefore of key importance when planning and adapting the range of courses (lectures, infrastructure). In addition, financing – especially at the cantonal universities – depends heavily on the number and origin of students (→ *chapter Tertiary-level education, page 189*; → *Efficiency/costs, page 230*).

Forecasts for the student figures

The number of students at universities is determined by several factors: the number of baccalaureate students (which in turn depends on demographic trends, preferences for baccalaureate education and institutional offerings), the rate of transitions to universities (which in turn depends on the economic situation and preferences for university education), the number of admissions with a foreign admission qualification (foreign-educated students) or with another Swiss qualification, the length of time spent in studies as well as the position of the individual higher education institutions compared to other universities. The higher education institutions themselves only have limited possibilities of influencing the number of students.

Over the past ten years, both the increase in baccalaureates as well as the increase in the transition rate to universities have led to an increase in student numbers (*FSO, 2024b*). The positive development of admissions to Bachelor’s and Master’s level with another Swiss qualification (e.g. supplementary exams federal vocational baccalaureate/specialised baccalaureate – university or graduations from universities of applied sciences [UAS] or from universities of teacher education [UTE]) or with a foreign admission qualification had the same effect.

For the development of student numbers up to 2033, the Federal Statistical Office (FSO) assumes in its reference scenario that the number of academic baccalaureates, the transition rate to universities and the number of admissions with another Swiss or foreign qualification will continue to increase (*FSO, 2024b*). Based on these assumptions, student numbers are expected to grow by just over 20% by 2033 (→ Figure 220). Depending on the assumptions made regarding the growth factors, growth of “only” 16% (scenario “low”) or even 26% (scenario “high”) is also possible. In absolute figures, the two scenarios differ by around 14,000 students in 2033, which corresponds to 11% of the student population in 2023 and reflects the high level of uncertainty with regard to future development. Regardless of the scenario, however, the student numbers will rise significantly over the next few years, which will lead to higher costs (→ *Efficiency/costs, page 230*). If student-teacher ratios were to be kept constant, around 1,900 full-time positions (+26%) would need to be created based on the “high” scenario. If the headcount remained the same, the student-teacher ratio would increase from 18.3 students per full-time equivalent (FTE) of the academic staff to 23.1.

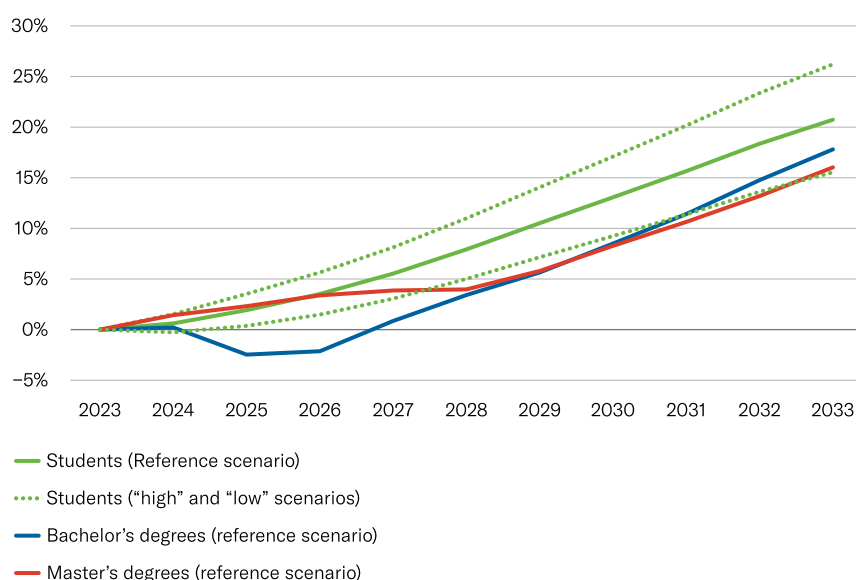
In line with the increase in student numbers, an increase in the number of graduations is also expected (+17% by 2033). The greatest increase in students and graduations is expected in the field of information and

communication technology (FSO, 2025g). Comparatively low growth is forecast in the humanities and social sciences as well as in law and economics.

220 Forecast development of student numbers and graduations, 2023–2033

Changes with respect to 2023

Data: FSO; calculations: SCCRE



Free choice of study courses

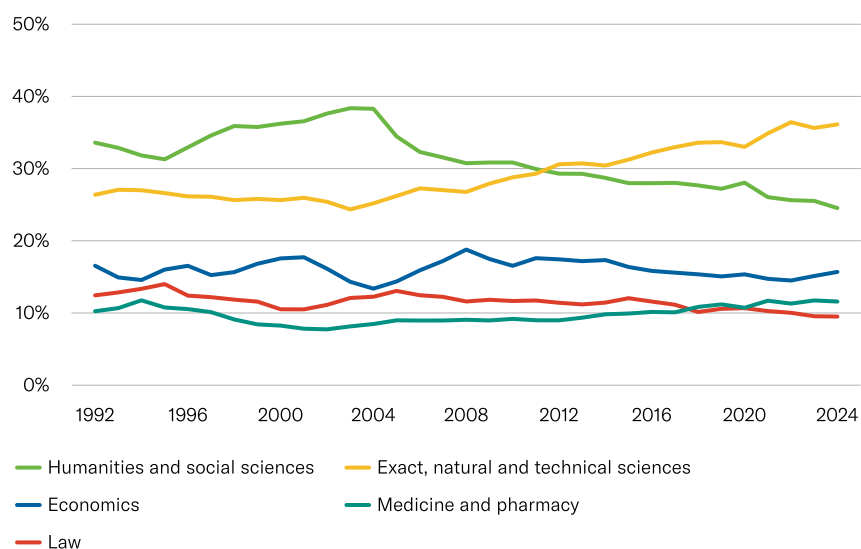
In Switzerland, examination-free access to universities with the baccalaureate is an important cornerstone that should be safeguarded in the long term (EAER & EDK, 2023). Unlike in most other countries, students are free to choose both the higher education institution as well as the field of study, which can have a positive effect on the course of study (Berlingieri et al., 2023). The only exceptions are the fields of medicine and sports science, which are currently subject to admission restrictions at German-speaking Swiss universities. Changes in the composition of student numbers in the individual fields of study therefore primarily reflect changes in student preferences. Various fluctuations can be observed over time. The share of new students in the humanities and social sciences has fallen steadily since the early 2000s, from 38% in 2004 to 25% in 2024 (→ Figure 221). In contrast, the share of exact and natural sciences has increased. In addition, the last fifteen years have seen a slight decline in the areas of economics and law and a slight increase in the area of medicine.

In order to control the number of **foreign-educated foreign nationals** there are admission restrictions at two higher education institutions – the University of St. Gallen and ETH Lausanne (EPFL).

221 Shares of student intake by groups of fields of study, 1992–2024

Admissions to the level Bachelor or licentiate/diploma students

Data: FSO; calculations: SCCRE

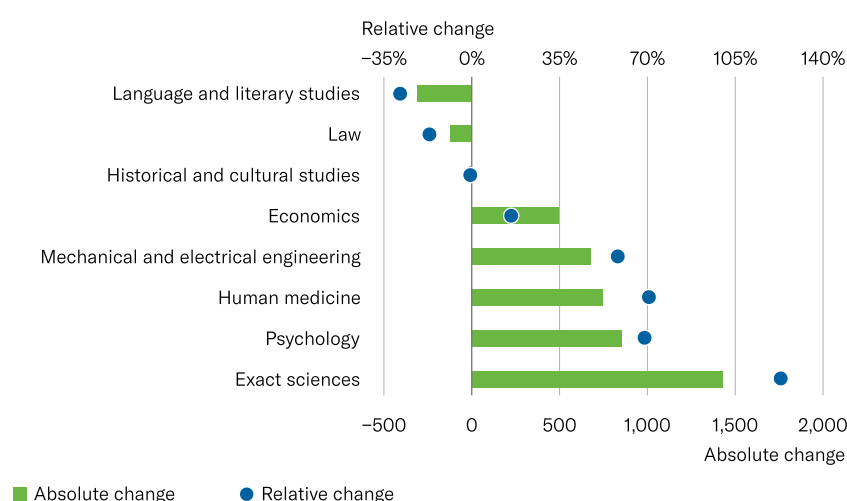


However, the changes shown do not indicate anything about the changes in absolute figures that are relevant for the organisation of studies – and later for the labour market. In addition, they conceal heterogeneous developments within a field of study. Figure 222, based on selected fields of study, indicates that, in the humanities and social sciences, language and literary studies are particularly affected by a decline in student numbers, while the number of students in psychology has actually increased. There are also more new students in economics, although the share of economics has declined overall. The question of whether the development of student numbers also reflects a change in demand on the labour market is difficult to answer. At all events, sharp increases or decreases in student numbers present the higher education institutions with the challenge of recruiting or, if necessary, reducing staff in a timely manner in order to ensure appropriate student-teacher ratios (→ *Efficiency/costs*, page 230).

222 Change in the number of admissions to Bachelor's degree programmes in selected fields of study, 2010–2024

In absolute figures and relative to the opening number of the respective field of study (in percent)

Data: FSO; calculations: SCCRE



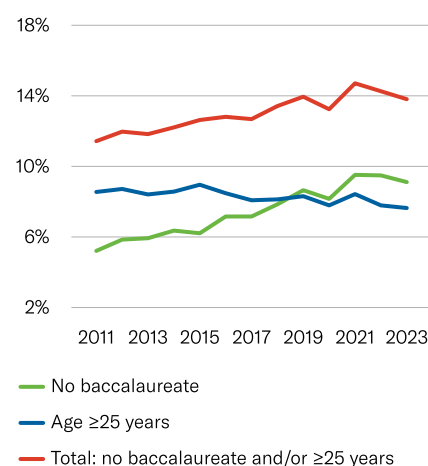
In view of the acute shortage of doctors, the federal government and the cantons have sustainably increased the number of training places in this field as part of the 2017–2020 special programme “Increasing the Number of Graduations in Medicine” in order to reduce dependence on foreign doctors. The aim was to increase the number of annual graduations in Human Medicine from almost 900 (in 2016) to over 1,300 in 2025, which is expected (*swissuniversities, 2021b*). However, dependence on foreign doctors remains high, while at the same time the demand for medical studies greatly exceeds study capacity. It is becoming apparent that the federal government and the cantons will have to allocate even more funds to expand study places and clinical internships over the next few years. However, with regard to later practice as a doctor, the question also arises as to whether the previous admission tests and selection procedures allow the “right” students to be admitted – persons who not only possess the skills required for their studies and the medical profession, but also have the desire to work as doctors in the long term. Evaluations of the university graduate surveys show that, of those who completed their studies in human medicine in 2018, one in seven to eight people was not working as a (junior) doctor just five years later.

In addition to the field of study, students are also free to choose the higher education institution. Upon admission to Bachelor's level (and consecutive Master's degree programmes), selection by higher education institutions for persons with a Swiss admission qualification is not permitted. As local education providers, universities can in principle have an influence on the choice of higher education institution (→ *Institutions, page 216*), but in fact the possibilities of influence are relatively small, as the majority of students choose the nearest university (*Denzler & Wolter, 2010*).

223 Share of students without an academic baccalaureate and of students aged 25+

Upon admission to a new Bachelor's degree programme; persons resident in Switzerland prior to commencement of studies

Data: FSO (LABB); calculations: SCCRE



According to the HEdA, eight **university institutes** organised under private law are accredited (as of July 2025): the UniDistance Suisse in Brig, the Institut de hautes études internationales et du développement (IHEID)² in Geneva, the Theological University of Chur, the University of Theology of Basel, the University Institute of Schaffhausen, the Franklin University in Sorengo, the International Institute for Management Development in Lausanne and the Swiss University Institute of Traditional Chinese Medicine (SWISS TCM UNI) in Bad Zurzach.³ The UniDistance Suisse and IHEID are recognised under contribution law and receive contributions from the federal government and the cantons.

Non-traditional students

The traditional access to universities is via the academic baccalaureate, whereby the transition to the universities is usually seamless or after one or two interim years. The typical student is therefore relatively young and has little or no professional experience. In addition, however, there is a growing group of non-traditional students who enter university via other paths and usually have already been working as well as completing vocational training. The share of students who started their studies when they were aged 25 or older or started without a baccalaureate is now 14% (→ Figure 223). This group has grown steadily in recent years, which can be attributed to the increase in the number of persons with the supplementary exam “Vocational baccalaureate – universities”. Non-traditional students can enhance the academic debate based on their professional and life experience. At the same time, higher education institutions are faced with the challenge of meeting the different needs of their students, for example through more flexible study models that enable them to work alongside their studies (→ *chapter Tertiary-level education*, page 189).

Institutions

According to the Higher Education Funding and Coordination Act (HEdA)¹, the university landscape comprises the ten cantonal universities, the two Federal Institutes of Technology (ETH) and the university institutions accredited under the Higher Education Funding and Coordination Act (→ *margin text*). The individual universities differ significantly in size (→ Figure 224). By far the largest university is the University of Zurich with approximately 22,000 students. The smallest universities include Neuchâtel and Lucerne, with less than 5,000 students, as well as the Università della Svizzera italiana (USI). The majority of universities are comprehensive universities, whereby the fields of study are composed differently depending on the university. The two ETHs, the Universities of St. Gallen and Lucerne and the Università della Svizzera italiana are specialised universities.

1 Federal Act on Funding and Coordination of the Swiss Higher Education Sector (HEdA) of 30 September 2011.

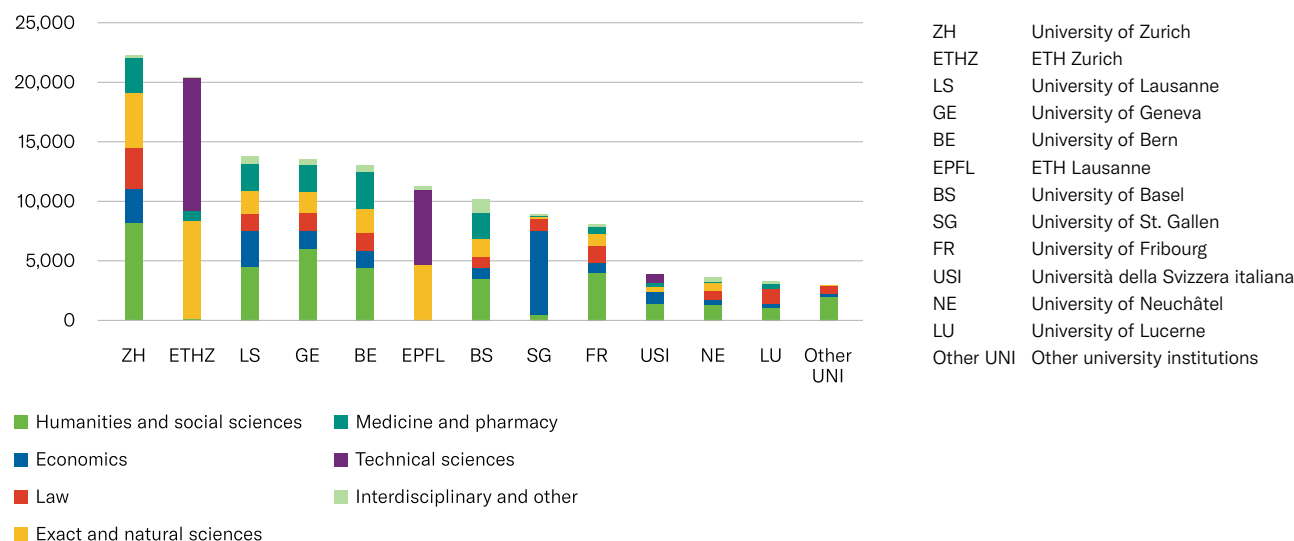
2 Since 2017, the IHEID has been recorded in the statistics of the Federal Statistical Office in the category “Other university institutions”. It previously counted as part of the University of Geneva.

3 Until the mid-2010s, the Kurt Bösch University Institute and the Swiss Graduate School of Public Administration (IDHEAP), both of which are integrated into universities, as well as the former Swiss Office for In-service Training of Upper Secondary Teachers (WBZ) – now the Swiss Centre for Secondary Schools, ZEM CES), were additionally classed as institutions of higher education.

224 Student numbers by institution, 2024

Bachelor's and Master's students

Data: FSO



Even if the majority of new students choose the nearest university (Denzler & Wolter, 2010), higher education institutions can attract prospective students from other regions, for example through an interesting range of subjects, attractive study conditions or their reputation. The market shares of the individual higher education institutions have thus shifted slightly over the last ten years (→ Figure 225).

ETH Zurich, which has always attracted students from all over Switzerland due to its range of subjects, was able to attract the most students, while the University of Fribourg suffered the greatest losses. The shifts can partially be explained by the changed demand for the individual fields of study. Demand fell most sharply in the humanities and social sciences, while it rose most sharply in the exact sciences and in the natural sciences. At ETH Lausanne (EPFL), the increase in market share is almost entirely attributable to the growing number of foreign students.

Origin of the students

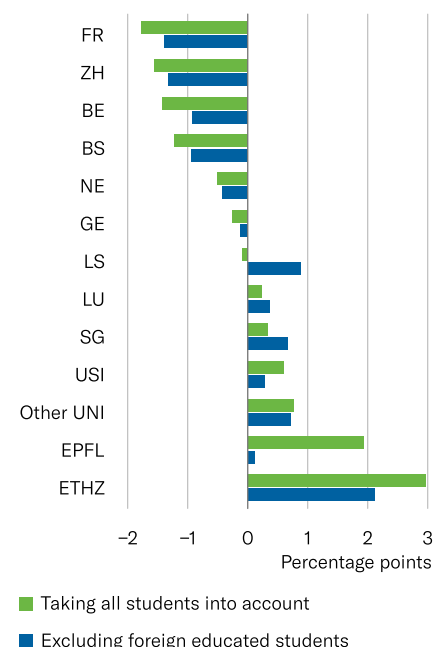
At universities, a good third of students come from the canton in which they are based, slightly more than two-fifths from another canton and one-fifth from abroad. However, the proportion of international students varies widely between levels of study – it is twice as high at Master's level than at Bachelor's level (31% versus 16% in 2024). Higher education institutions value international students because they enhance cultural diversity, promote intercultural exchange, bring new perspectives and contribute to international networking. In addition, a high degree of internationality in the student body is also seen as an indicator of the high quality and appeal of higher education and the high prestige of a university. However, a large number of international students also entails funding gaps.

On the other hand, the number of international students depends not only on the appeal of the individual higher education institutions, but also

225 Changes in market shares, 2014–2024

Measured by shares of students in the first and second cycle

Data: FSO (SHIS-studex); calculations: SCCRE

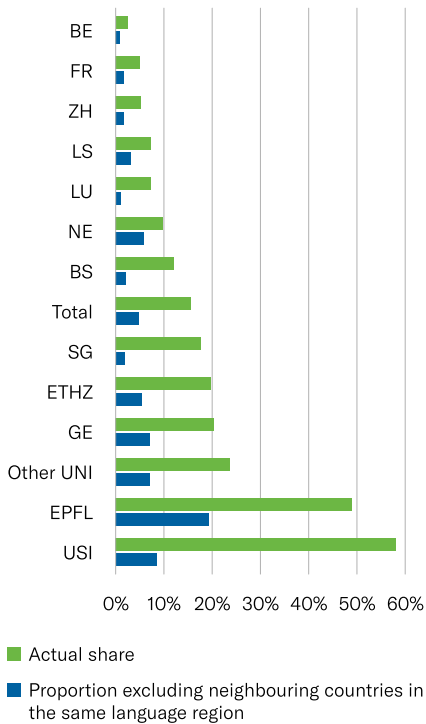


International students: Persons with foreign citizenship who had their place of residence abroad prior to commencement of studies.

226 Share of international students at Bachelor's level

By UNI, 2024

Data: FSO (SHIS-studex); calculations: SCCRE



on their geographical location. In border regions, the share of students from neighbouring countries is higher on average. By far the most international student body can be found at EPFL and USI (→ Figure 226). If we consider only foreign-educated students from countries that do not border Switzerland or come from neighbouring countries of another language region, it becomes apparent that at Bachelor level, only EPFL is affected by a “genuine” internationalisation.

Master's as a standard qualification at universities

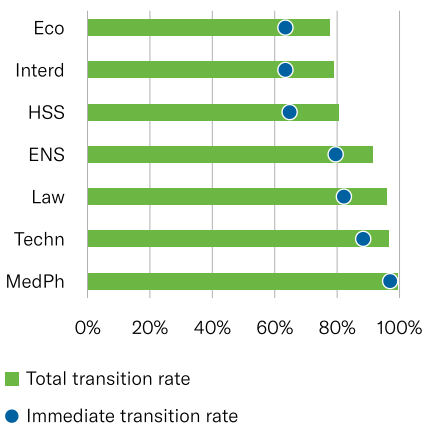
With the Bologna reform, the licentiate or diploma at universities has been replaced by a Bachelor's degree with labour market skills (after three years of study) and a Master's degree that builds on it (after a further one-and-a-half to two years of study). Although students have the option of entering the labour market after only three years of study with a university degree, the Master's degree has remained the standard degree at universities. On average, 87% of Bachelor students continue studies within three years, most directly following the Bachelor degree. However, the transition rate is not the same in all fields of study.

In the humanities, social sciences and economics, only around four out of five Bachelor's graduates start a Master's degree within three years of completing their Bachelor's degree, while in medicine and pharmacy, law and the technical sciences 96% or more continue with a Master's degree (→ Figure 227). Overall, the rate of transition to a Master's degree programme is slightly higher for men than for women, which can be attributed to the different choice of subjects. Most students also start their Master's degree at the same university where they completed their Bachelor's degree (→ chapter Tertiary-level education, page 189).

227 Rate of transition from Bachelor's to Master's degree programmes

By field of study; transition in same year or up to 3 years after Bachelor's degree 2020

Data: FSO (LABB); calculations: SCCRE

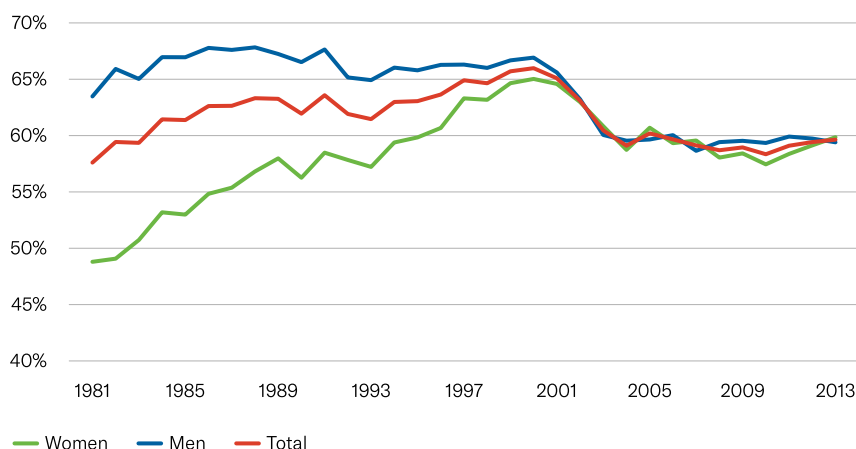


- Eco Economics
- ENS Exact and natural sciences
- HSS Humanities and social sciences
- Interd Interdisciplinary and other
- MedPh Medicine and pharmacy
- Techn Technical science

In today's Bologna system, around 60% of the students who started a Bachelor's degree at a university attain a Master's degree from a university within ten years of starting their studies (→ Figure 228). There are several reasons why this share is not higher: Firstly, around one quarter of students do not obtain a university degree at Bachelor level (→ Academic success – discontinued studies, page 220). Secondly, not all students transition to a Master's degree programme, despite the high transition rate. Thirdly, several students also drop out of their studies at Master's level. Due to the possibility of obtaining a first degree after just three years, more persons in the current system obtain a university degree than in the previous system with a licentiate and diploma. However, the share of those who graduate from university in their second cycle is considerably less in the Bologna system than in the old system (60% of the 2013 entry cohort compared with 66% of the 2000 entry cohort).

228 Share of students with a degree in the 2nd cycle of a UNI up to ten years after admission to a UNI, 1981–2013

Data: FSO (LABB); calculations: SCCRE



Academic staff and junior career pathways

A comparatively small share of the academic staff at universities consists of professors and (other) lecturers, but a larger share of non-professional teaching staff: (Senior) assistants, post-doctoral researchers, research associates and individuals writing their habilitation (→ *chapter Tertiary-level education*, page 189). While professors are generally employed on a permanent basis, the vast majority of non-professional teaching staff are employed on a fixed-term basis.

Of those who have completed their doctorate at a Swiss higher education institution, around a quarter take up a post-doctorate at a Swiss higher education institution; around 6% start a post-doctorate abroad as part of a mobility grant from the Swiss National Science Foundation (SNSF) (FSO, 2023d). However, the probability of subsequently obtaining a professorship at a Swiss higher education institution is relatively low. Eight years later, only a good half of those who started a postdoc or received an SNSF grant in Switzerland are still working in Switzerland. 7% hold a professorship at a Swiss higher education institution, 15% are still employed as postdocs and a good 21% work as research associates, lecturers or in another position (e.g. in the field of third space) (→ Figure 229). It is not known how many of the persons who emigrated abroad continue to work in the academic field or already hold a professorship.

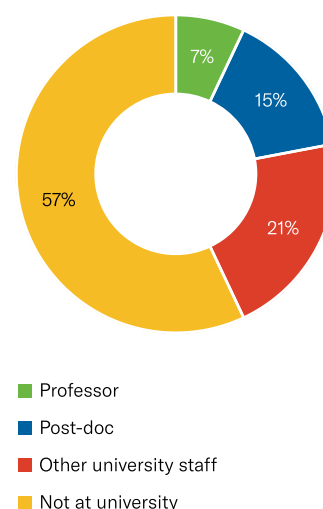
The path from a doctorate to a professorship is characterised not only by a high level of uncertainty, but also by precariousness. Fixed-term employment contracts make a significant contribution to this. Five years after completion of their Doctorate, around two-thirds of those working in the academic field at a higher education institution are still employed on a fixed-term basis; this share has only decreased slightly in recent years (→ Figure 230). Even eight years after the start of the postdoc phase, 60% still have a fixed-term position (FSO, 2024k).

In recent years, various initiatives have been taken to improve the phase between Doctorate and professorship: The number of assistant professorships with tenure-track contracts was increased, early self-employment was

229 Professional position 8 years after starting postdoc

Persons who started a postdoc in Switzerland in 2015 or received an SNSF grant and are gainfully employed in Switzerland eight years later

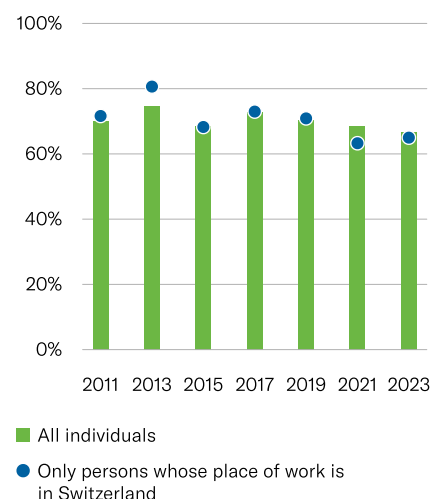
Data: FSO; calculations: SCCRE



230 Share of persons with fixed-term employment in academia, 2011–2023

5 years after completion of the Doctorate, measured against all PhD graduates employed in the academic field

Data: FSO (EHA); calculations: SCCRE



The **qualifications framework** for the Swiss higher education area summarises the skills to be achieved by the students at the end of each cycle in the following five categories: “knowledge and understanding”, “application of knowledge and understanding”, “judgement”, “communication skills” and “self-directed learning”.

promoted through temporary funding instruments, the postdoc phase was more clearly structured, and new career opportunities were created at universities. Based on a report on early-career researchers in Switzerland (*Haering et al., 2023*) the federal government and the cantons have launched a programme for the promotion of early-career researchers for the period 2025–2028 – although the funding has only been promised for 2025 and 2026 (as of July 2025). Action plans aim to test and implement measures to reduce precarious employment relationships, improve working conditions and shape transitions in academic and non-academic careers. In addition, the Swiss Conference of Higher Education Institutions (SHK) has adopted principles to be taken into account in the promotion of early-career researchers (*SHK, 2023*).

Effectiveness

A primary aim of university education is to prepare the students for professional activities that require academic knowledge. The Qualifications Framework for the Swiss Higher Education Area (nqf.ch-HS) (*swissuniversities, 2021a*) sets the minimum skills that students should have at the end of their studies. The desired learning outcomes are usually defined on the level of an individual programme of study, a module or a course unit. However, direct verification of the effectiveness of the acquisition of skills is difficult, as the standardised tests required are usually lacking. In order to nevertheless determine the effectiveness of university education, indicators of labour market integration are used below (for analyses on returns on education, see *chapter Cumulative effects, page 347*). Although these are not measures of competence, they do provide information on whether the skills acquired at a higher education institution are in demand on the labour market. Indicators of graduations or drop-outs can also provide information on the effectiveness of university education, but are at least as difficult to interpret as labour market indicators as a measure of the acquisition of skills. On the one hand, higher education institutions can control the graduation rate independently of the acquisition of skills. On the other hand, successful graduation also depends on factors over which the higher education institutions have no influence. In addition, the value of dropping out of studies on the labour market and the value of non-cognitive skills are discussed.

Academic success – discontinued studies

The graduation rate can be an indicator of the effectiveness of a degree programme or a higher education institution – but only on condition that the acquisition of the required skills is a necessary requisite for graduation and that, conversely, dropping out of studies means a lack of the required skills, which is not always the case in reality.

In the Bachelor’s programme, on average, 76% of students acquire a university degree within eight years of starting their studies, with between 4 and 15% completing their studies in a field of study other than the one they originally selected (→ Figure 231). If one adds the degrees at universities of teacher education (UTE) and universities of applied sciences (UAS)

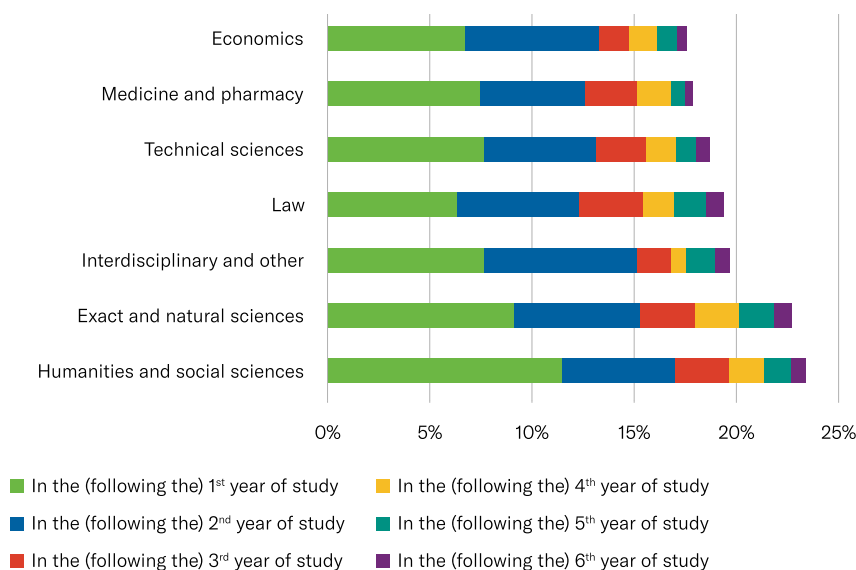
to this – in other words, the degrees after a change to a different university type – the graduation rate increases to 85% on average. However, the graduation rates differ significantly between the fields of study. In total, 10% dropped out of their studies, 2% left Switzerland without a qualification and 3% are still enrolled at a higher education institution.

By international standards, admission to the universities in Switzerland is regulated restrictively, which is reflected in the comparatively low baccalaureate rate. Measured against this, a substantial share of university students do not obtain a university degree. In their declarations on the common education policy objectives for the Swiss Education Area (*EAER & EDK, 2015, 2019, 2023*) the federal government and the cantons have thus repeatedly declared the goal of reducing the number of drop-outs in studies without lowering quality standards (Goal 5). In particular, the drop-outs that occur in a late phase of studies should be minimised as far as possible. As Figure 232 shows, the number of drop-outs in studies – i.e. departures from universities without a graduation – decreases with each academic year. Depending on the group of fields of study, the share of students who drop out of university studies in their third year or later is between 4 and 7% (average: 6%). This corresponds to between one-third and one-quarter of all drop-outs.

232 Time of drop-outs at UNI by field of study group

Bachelor's intake cohort 2017

Data: FSO (LABB); calculations: SCCRE

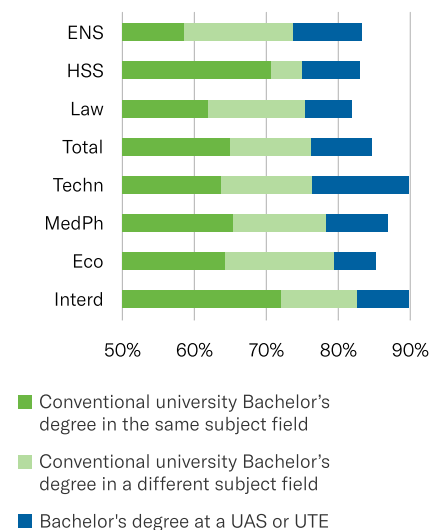


On average, 9% of students drop out of university studies in the first year of study (or after completion of the first year), 6% in year 2 and a further 6% in years 3–6. All in all, 21% leave the university education system without a graduation within six years of starting their studies.

231 Student success rates by group of fields of study

Bachelor's degree within eight years of starting a course at a UNI for 2015 admissions resident in Switzerland prior to commencement of studies

Data: FSO

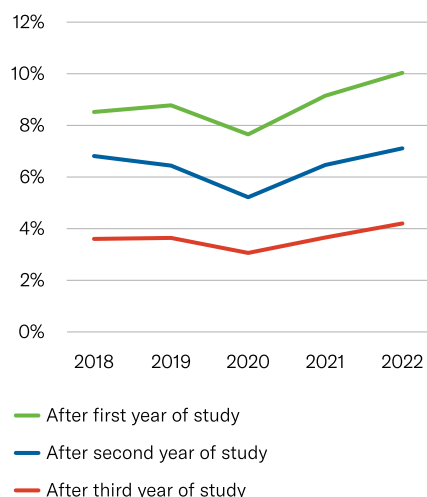


Eco Economics
ENS Exact and natural sciences
HSS Humanities and social sciences
Interd Interdisciplinary and other
MedPh Medicine and pharmacy
Techn Technical science

233 Share of drop-outs at UNI by previous academic year, 2018–2022

Persons in undergraduate studies and with place of residence (before commencement of studies) in Switzerland

Data: FSO (LABB); calculations: SCCRE



The year refers to the end of the respective academic year (e.g. 2018 = end of the 2017/18 academic year). In order to rule out the possibility that an interim year entered in the 2022/23 academic year is incorrectly defined as a drop-out, only the drop-outs up to 2022 are shown.

The development over time shows that the number of study drop-outs after the first and second years of study fell in the short term in 2020—the year of the outbreak of the COVID-19 pandemic (→ Figure 233). In the following year, the drop-out rate returned to the usual level. The slump in 2020 thus did not lead to students dropping out of their studies at a later date. The COVID-19 pandemic therefore appears to have had a positive impact on remaining in studies. Findings from Italy, which show that the pandemic has increased the number of credits acquired and the grades achieved, point in the same direction (*Binelli et al., 2024*). A longer individual learning time and the availability of lecture recordings contributed to this positive effect.

According to the declaration on the common education policy goals for the Swiss education area (*EAER & EDK, 2023*) the measures to reduce the number of study drop-outs should focus in particular on the transition from baccalaureate schools to universities (strengthening study and career guidance at baccalaureate schools, collaboration between the universities and the baccalaureate schools with regard to the choice of course of study as well as the advice and support to students at the start of and during their studies). This focus can, on the one hand, be justified by the expectation that a good fit as well as a high level of integration of the students will benefit the academic success of the students. On the other hand, the aforementioned measures do not restrict the universities in their function of selecting services, which is necessary to maintain quality requirements.

Various measures have been taken in recent years to increase the success of the studies. These include mentoring programmes, coaching, self-assessments, preparatory courses and information day events. Their effectiveness has not yet been systematically examined in Switzerland, nor have the findings been published.

In the international literature, only a few measures can be found that have a demonstrably positive effect on the success of the study (*Ibsen & Rosholm, 2024*). As the results of a systematic review and a meta-analysis of measures relating to student drop-out and success suggest (*Ibsen & Rosholm, 2024*), interventions that control the composition of students in individual courses by gender or ability have the greatest or most promising impact. For example, it could be shown for economics students that tutoring groups composed such that students with similar abilities were placed in a group reduced the drop-out rate (*Booij et al., 2017*). Women-only courses attended once a week also reduced the drop-out rate (*Booth et al., 2018*). Positive effects also tend to be found for certain (repeat) courses as well as for feedback and support measures such as mentoring programmes, in which students are supervised by lecturers (*Ibsen & Rosholm, 2024*). For example, findings show that supportive text messages can reduce the drop-out rate during potentially stressful study phases (*Deighton et al., 2019*). The positive effects of course repetitions on academic performance and graduation rates (*Chen & Jiang, 2024; Tafreschi & Thiemann, 2016*) were also demonstrated using the example of a Swiss university. Another example of positive intervention is the signing of a target agreement to adhere to the recommended curriculum (voluntary commitment), accompanied by a reminder each semester. This measure increases the success rate of studies while shortening the duration of the study (*Brade et al., 2024*).

Perhaps the most important predictors of academic success include the students' educational background, their former academic performance and their willingness to learn (*Larsen et al., 2013*). For Switzerland, too, findings

from the cantons of Aargau and Zug confirm a positive connection between good grades at baccalaureate and the probability of successfully completing a course of study (*Diem, 2021, 2024*). The extent to which the influence of the baccalaureate grade can be explained by cognitive abilities and technical skills – or by non-cognitive skills such as learning techniques or willingness to learn, which are likely to correlate positively with the baccalaureate grades – cannot be explained with the available analyses. However, it can be shown that the probability of successfully completing a university course also correlates strongly with the skills measured at the end of compulsory education (→ Figure 234). Persons who successfully completed their Bachelor's degree at university performed better at the end of compulsory education than people who dropped out of their studies (→ Figure 235).

These results are remarkable insofar as persons entering university are subject to strong positive selection. The probability of attending and successfully completing baccalaureate school depends heavily on the PISA points achieved (*SCCRE, 2023*).

Value of a discontinued course on the labour market

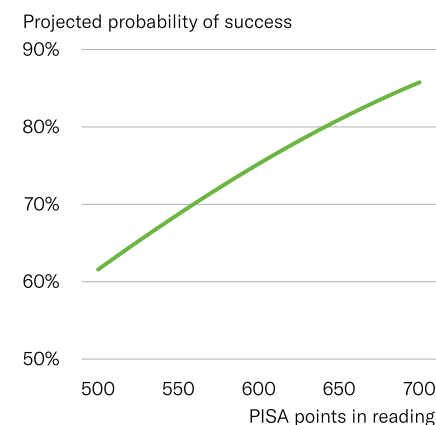
In view of the fact that at least 10% of all university students leave the higher education system without graduating, it is interesting to see how those who drop out of studies are accepted into the labour market. However, it is not easy to estimate the value of dropping out of studies, as it can be assumed that the cognitive and non-cognitive skills of those who drop out differ from university graduates and those who have not entered higher education.

In general, the results of the international research literature indicate that drop-outs have a considerably lower degree of employment opportunities and lower wages than university graduates (*Berlingieri & Bolz, 2025; Di Stasio & van de Werfhorst, 2016; Giani et al., 2020; Heigle & Pfeiffer, 2019; Neugebauer & Daniel, 2022*). There are at least three explanations for this: Firstly, university graduates were able to acquire more knowledge and skills due to the longer period of training. Secondly, with their university degree, they have formal proof – a certificate of knowledge and skills – on which employers are able to rely – even more so in Switzerland than in other countries. Thirdly, dropping out of study can be interpreted as a negative signal for non-observable cognitive and non-cognitive skills. Studies that compare the labour market opportunities of school drop-outs with those of persons who did not start studies after completing upper-secondary education yield different findings. Some note that study drop-outs have better employment opportunities and higher wages (*Berlingieri & Bolz, 2020; Giani et al., 2020; Matković & Kogan, 2012*), others find no differences or even a lower level of labour market opportunities (*Ghignoni et al., 2019; Hällsten, 2017; Neugebauer & Daniel, 2022*). The differences in results can partially be attributed to the fact that the value of drop-out varies depending on the country and context. In addition, labour market opportunities also depend on the proven skills and experience of those who drop out of studies. This indicates that good academic performance, a professional proximity between studies and work, a job-relevant internship or informally acquired job-relevant skills increase employment opportunities (*Daniel et al., 2019; Di Stasio & van de Werfhorst, 2016; Neugebauer & Daniel, 2022*).

234 Probability of completing a degree at a UNI depending on PISA performance

Persons enrolled in a university course who took part in the 2012 PISA survey

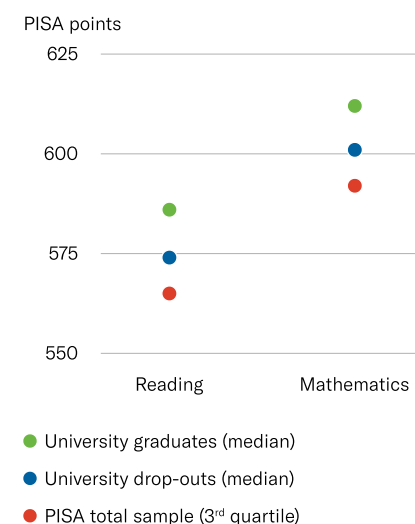
Data: SCCRE (SEATS I); calculations: SCCRE



235 PISA performance of successful/unsuccessful UNI students

Persons who participated in the 2012 PISA survey

Data: SCCRE (SEATS I); calculations: SCCRE



In the **Discrete Choice Experiment** by *Diem et al. (2025)*, profiles of different candidates were presented to employers. They were asked to compare two applications and indicate which person they would choose for the position of Executive Assistant. The description of the selection sets included both drop-outs and baccalaureate students who had not entered a higher education institution. The sets presented differed according to the type of activity since graduating from the baccalaureate (working and travelling, trainee programme) or the subject of study (Business Administration, Law, German Studies, Philosophy), the time since graduating from the baccalaureate, salary expectations and gender.

The light green shade means that the salaries of these groups of persons do not, statistically, differ significantly from those of the comparison group “worked and travelled” or, in the case of women, from those of men.

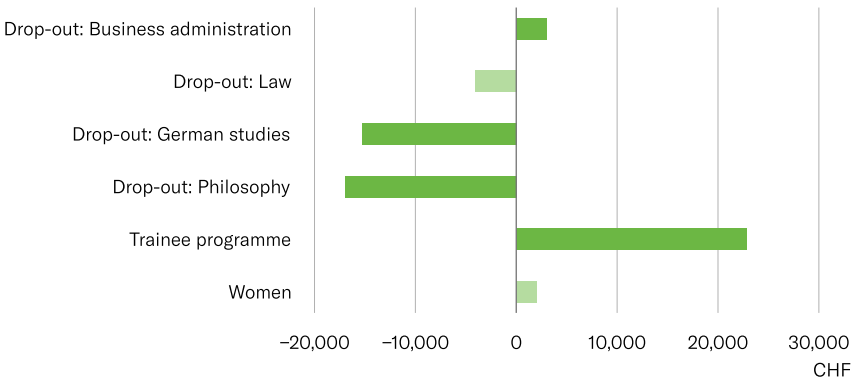
Non-cognitive skills are defined as personality traits and abilities that differ from purely cognitive abilities such as intelligence or memory performance (→ *chapter Cumulative effects*, page 347). Examples of non-cognitive skills include patience, teamwork, motivation, perseverance, openness, willingness to cooperate or curiosity.

A survey experiment conducted in Switzerland amongst employers (→ *margin text*) for the first time provides indications of the monetary value of dropping out of studies compared to work and travel experience (*Diem et al., 2025*). The results show that the persons responsible for recruiting staff hardly reward a person who has dropped out of a course of study for a position as an assistant to the management in monetary terms (→ Figure 236). They would even pay around CHF 15,000 less per year to a person who has dropped out of non-subject-related studies than to a baccalaureate student who has spent their time travelling and working since completing their baccalaureate. They would pay the highest salary to persons who completed a trainee programme. According to the study, it is worth dropping out of studies compared to the option of not pursuing further formal qualifications, but only in monetary terms if the studies are related to the future professional activity. If this is not the case, the drop-out leads to a lower living income – also taking the loss of income during the course of study into consideration. Vocational, non-formal education can also be much more profitable than dropping out of studies.

236 Value of a discontinued course of study

For the position of Executive Assistant compared to work and travel experience

Data: *Diem et al (2025)*



Non-cognitive skills

Apart from cognitive abilities, non-cognitive skills can have a strong impact on educational success (*Molnár & Kocsis, 2024; Sorrenti et al., 2025*). At university level, findings show that the observed learning strategies, motivations and attitudes together explain about as much variance in academic success as subject-specific and general knowledge combined (*Molnár & Kocsis, 2024*). The results presented by Shan and Zölitz (2025) for economics students at a Swiss university also provide indications that conscientiousness and a competitive orientation have a positive impact on grades in business (→ Figure 237).

However, personality traits can play a role not just in an educational trajectory, but also in subsequent labour market success. The results of a meta-analysis (*Cabus et al., 2021*) suggest that conscientiousness and openness lead to higher earnings, while tolerance (consideration, willingness

to cooperate, empathy) and neuroticism (low emotional stability) are associated with lower earnings.

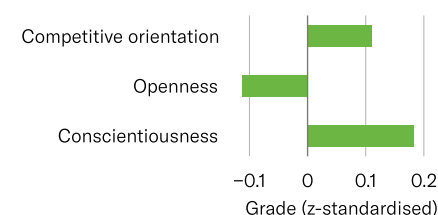
Although personality traits by definition have a certain stability, there is room for development – even in higher education. The results of an intervention study at a Spanish university to increase resilience show that students' resilience increased as a result of the intervention (*Rodríguez-Planas et al., 2023*). The more vulnerable students in particular benefited from the intervention. However, no effects on academic performance could be found. As the findings of a study from Switzerland suggest (*Shan & Zölitz, 2025*), the personality traits of peers can also influence own personality traits. Students who were in a group together with more conscientious, open and competitive fellow students became more conscientious, open and competitive themselves. The effects on conscientiousness and competitive orientation were still traceable even three years after the experiment. Analyses of the mechanisms revealed that the students primarily adopted those characteristics that had a positive effect on examination grades.

One explanation for individual success is also attributed to the grit level, which is related to the ability to overcome challenges and setbacks and to stick to goals even when faced with obstacles (→ *margin text*). Data from Switzerland shows that the grit level of university graduates (according to data from the university graduate survey) is higher than that of baccalaureate students (*Albiez et al., 2025*). There are two explanations for this: Firstly, the grit level may actually have increased over the course of training. The second explanation is that people with a higher grit level are more likely to transition to a university and graduate than people with a lower grit level (selection effect). The mechanism of the selection effect is supported by the finding that the probability of starting a Master's degree program after completing the Bachelor's degree also correlates positively with the grit level (based on the data from the graduate survey). It can also be shown that in fields of study in which the transition rate to Master's level is comparatively low – and thus selection effects can be more pronounced – the difference in grit level between Bachelor's and Master's graduates is significantly greater than in fields of study in which almost all students are starting a Master's degree (→ Figure 238).

237 Correlation between personality traits and final grade

In the field of Economics

Data: *Shan & Zölitz (2025)*

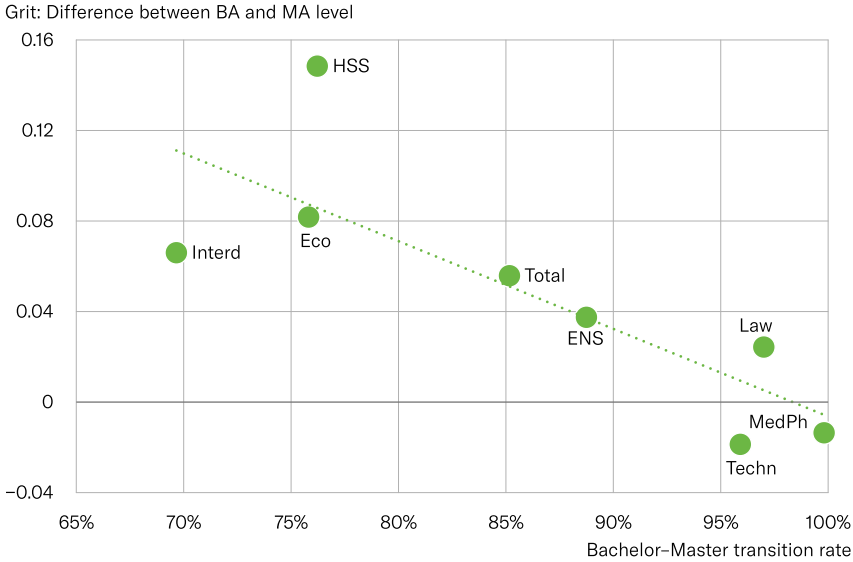


The **personality trait grit** measures the ability to pursue long-term goals persistently and not be discouraged by setbacks (*Duckworth et al., 2007; Schmidt et al., 2019*).

238 Differences in grit between Bachelor's and Master's graduates and transition rate from Bachelor's to Master's level

By groups of fields of study; 2022 graduate cohort (for information on the grit level) or 2019 Bachelor's degree cohort (for information on the transition rate)

Data: FSO (EHA, LABB); Calculations: SCCRE



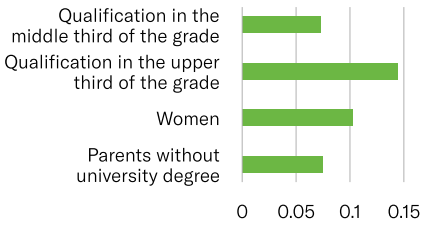
- Eco Economics
- ENS Exact and natural sciences
- Hum Humanities and social sciences
- Interd Interdisciplinary and other
- MedPh Medicine and pharmacy
- Techn Technical science

Grit is measured on a scale of 1 to 5. The average for Bachelor's graduates is 3.60, and for Master's graduates 3.65. The difference is statistically significant.

239 Grit by final grade, gender and educational background

Difference to persons with graduation in the lower third of the scale, to men and to persons with parents who have a university degree

Data: FSO (EHA); calculations: SCCRE



There are sometimes positive correlations between non-cognitive and cognitive skills (*Shan & Zölitz, 2025*). Regarding grit level, it can also be observed that persons who achieved better grades in their studies compared to students in the same field of study at the same university have a significantly higher grit level than persons with lower grades (→ Figure 239). In addition, the grit level also varies according to socio-demographic characteristics: Women, older students and persons whose parents do not have a university degree have higher grit values than men, younger students and persons whose parents have a university degree. There are also indications that grit influences graduates' employment opportunities. Persons with a higher grit level are more likely to be employed one year after completing their studies in an occupation appropriate to their education, in other words, in professional positions that require a university degree or are appropriate to the specialist qualifications acquired during their university studies. In this context, however, it is unclear whether the grit level has a causal effect on the quality of employment or whether there is a reverse causality.

Labour market success

Successful integration into the labour market is a key criterion for evaluating tertiary education, as it provides information on the extent to which the studies have equipped students with skills relevant to the labour market. However, the employability of the graduates does not depend only on their education at the higher education institution, but is also influenced by the skills which the students acquired even before they started their studies. The state of the regional labour market also has an impact on labour market

opportunities. Ultimately, the labour market success of graduates also depends on selection made during studies.

The vast majority of graduates successfully integrate into the labour market. According to the 2023 university graduate survey, one year after completing their Master's degree, an average of 91% of university graduates are in employment (→ *chapter Tertiary-level education, page 189*) and 4% are unemployed as defined by the International Labour Organization (ILO). This means that they are at least as well integrated into the labour market as 25 to 30-year-olds with upper-secondary education (their highest qualification). Inactivity or unemployment is sometimes an entry-level phenomenon. Five years after graduating, the share of unemployed individuals is at only 5% and the ILO unemployment rate is at 1.5%, which is considerably below the Swiss average of all employed individuals. Of those higher education graduates who are in employment one year after graduating, the vast majority (91%) are in suitable employment based on their education, in other words, work that requires a university degree or is at least appropriate to the specialist skills acquired during the course of study.

However, when it comes to starting a career, there are clear differences between the fields of study in terms of both labour force participation and the quality of employment (→ *Figure 240*). In the humanities, which are less career-specific, and in interdisciplinary studies, entering the job market is associated with rather greater difficulties, which, in addition to a below-average employment rate, is primarily reflected in a higher share of persons who are not adequately trained. However, comparatively low employment rates can also be found in law and natural sciences. Among graduates in 2018, the share of persons in training-appropriate employment increased by an average of 3 percentage points between the first and fifth years after completing their studies.⁴

The **unemployment rate according to ILO**

is defined as the share of the unemployed in the total labour force. Unemployed refers to persons who were not employed during the reference week, who in the previous four weeks actively sought work and were available to take up employment. The group of the employed and unemployed constitute the labour force.

A Belgian study suggests that **internships** – especially volunteers – increase recruitment opportunities (*Toback et al., 2024*). In Switzerland, around a third of university students have already completed an internship and a further third intend to complete another internship, although the proportions vary greatly depending on the field of study (*FSO, 2023c*).

⁴ The most recent cohort of graduates is shown in *Figure 240*. The values relating to the time “1 year after graduation” come from the 2022 cohort and not from the 2018 cohort.

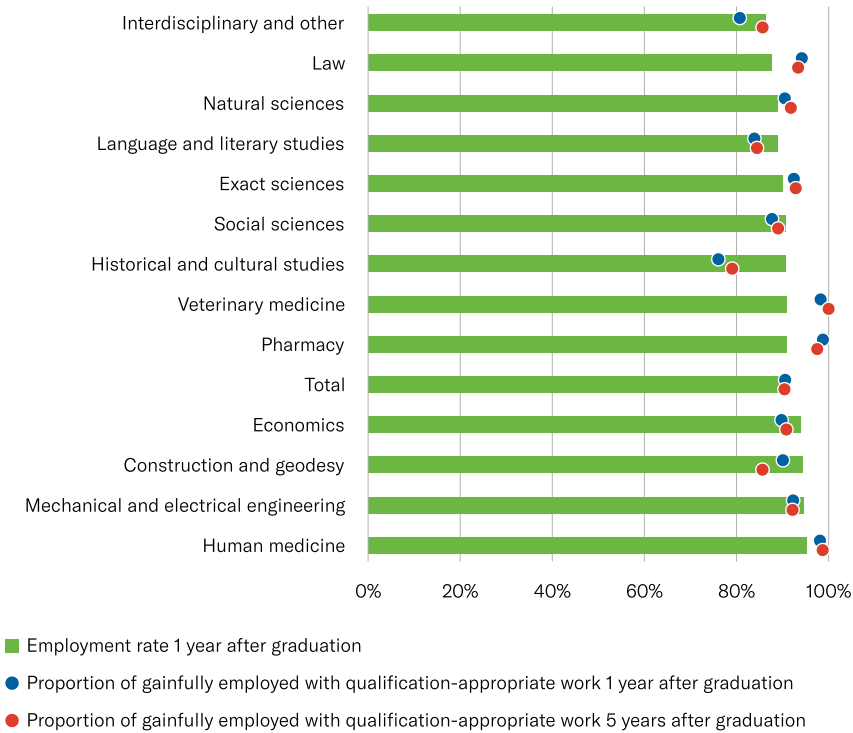
240 Labour market situation 1 year and 5 years after completion of studies, 2023

Graduates at Master's level; graduation cohort 2022 (1 year after graduation) or 2018 (5 years after graduation)

Data: FSO (EHA); calculations: SCCRE

Employment in **jobs appropriate to education** refers to persons whose professional position a) requires a university degree or b) displays a clear match with professional skills acquired during higher education (level 4 and 5 on a scale from 1 "not at all appropriate" to 5 "highly appropriate").

The categories of the "overarching/other" fields of study as well as those with less than 50 observations are not shown, but are included in the average value.



Entry into the labour market varies depending on the study cycle. According to the data from the university graduate survey, Bachelor's graduates are more likely to be inactive, more likely to be unemployed and more likely to be inadequately employed than persons who have completed a Master's degree. The best job market opportunities are those with a Doctorate. However, it is unclear to what extent these differences can be attributed to the different duration of study or to the selection between study cycles.

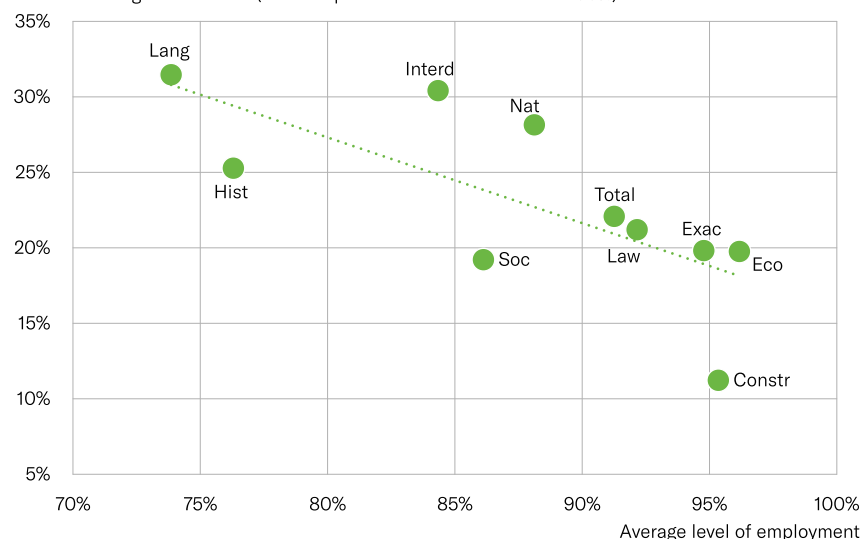
The level of employment or the desire for a higher workload can also indicate how well graduates are absorbed by the labour market. One year after graduating with a Master's degree, the average level of employment is a good 90%, with it varying between 74% (language and literary studies) and 99% (mechanical and electrical engineering) depending on the field of study. Of those graduates who work less than 90%, one-third cite the lack of full-time positions as the reason for their reduced workload. Overall, 6% of Master's graduates would like a higher level of employment, most often in language and literary studies (20%) and historical and cultural studies (16%). The fact that more persons in fields of study with a lower average level of employment would like to see their level of employment increased (→ Figure 241) confirms the assumption that part-time work is not always a free choice. This correlation exists regardless of gender, children and standardised income.

241 Level of employment and desire for a higher level of workload 1 year after Master's degree, 2023

Fields of study with at least 50 observations

Data: FSO (EHA); calculations: SCCRE

Desire for a higher workload (sub-sample: Persons with workload <90%)



Average level of employment:

Total from main and secondary employment

Desire for a higher workload:

Share of persons with a level of employment of less than 90% who want to increase their workload by at least 5% FTE.

Lang	Linguistics and literary studies
Hist	Historical and cultural studies
Interd	Interdisciplinary and other
Soc	Social sciences
Nat	Natural sciences
Exac	Exact sciences
Constr	Construction and geodesy
Eco	Economics

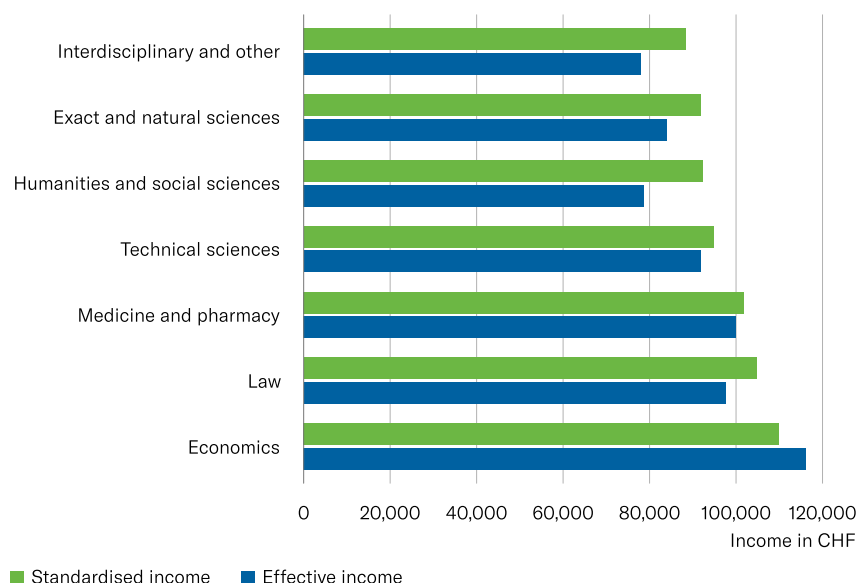
Five years after graduating with a Master's degree, gross income from employment, projected to a full-time position, amounts to around CHF 100,000. However, there are major wage differences between the fields of study (→ Figure 242). These are all the greater when the effective incomes are considered, as the average level of employment is also lower in the fields of study with lower wages. Graduates of economics earn the highest wages, followed by law, medicine and pharmacy. As women are more likely to choose subjects with lower earnings prospects, their standardised income is somewhat lower than that of men. By contrast, the incomes projected to full-time employment do not differ for the same field of study five years after graduation.

Results of a **field experiment** in Germany, in which disadvantaged high school graduates were provided with information on the costs and income of higher education and on the long-term earnings prospects of university graduates from different disciplines, suggest that such an information intervention leads to more informed persons choosing more financially rewarding subjects (Peter *et al.*, 2024). The positive effect was evident in both women and men.

242 Estimated income 5 years after Master's degree, 2023

At the age of 31, based on quantile regressions (median wage); standardised income relates to main occupation; effective income also includes income from secondary employment, overtime and bonuses.

Data: FSO (EHA); calculations: SCCRE



Efficiency/costs

If one wants to assess the efficiency – in other words, the relationship between the use of funds (input) and the achievement of goals (output) – adequately in university education, not only comparable and suitable data for the output is required (effectiveness), but also for the inputs. Both requirements are only partially met, which means that both assumptions and compromises have to be made. Regarding costs, although the accounting models between the universities have been broadly harmonised, there is no data available on student numbers in full-time equivalents. Data on study intensity is available (based on the number of evaluated ECTS credits), but it is not suitable for calculating the costs per student full-time equivalent due to methodological reasons. In view of the difficulty of adequately measuring efficiency, the following remarks focus on the costs of the universities and their incomes, with international comparisons being made in the *chapter Tertiary-level education* (page 189). In addition, the impact of changes in field of study on the duration of studies is discussed and the evaluation of studies from the perspective of the graduates is examined.

Financing the universities

The amount of money that the universities (can) spend on education depends largely on the income that they receive from the federal government and the cantons and which they generate themselves. In Switzerland, expenditure on research and teaching is largely covered by contributions from the public sector (→ *chapter Tertiary-level education*, page 189). At the

Federal Institutes of Technology, the federal government's global budget covered 70% of expenses in 2023. At the cantonal universities, 12% of the expenses were covered on average by basic federal contributions under the Higher Education Funding and Coordination Act, two-fifths by contributions from the cantons in which the university is located and 10% by contributions from other cantons under the Intercantonal University Agreement (IUV)⁵ for students from outside the canton. However, the share of contributions from outside the canton varies greatly between universities, depending on the share of students from outside the canton.

The basic federal contributions to cantonal universities have risen continuously in nominal terms since 2012. In real terms, however, they have been stagnating since 2021 or even declining (→ Figure 243). As the number of students at cantonal universities has also risen continuously and growth is also expected in the coming years, the basic contributions per student are falling. Between 2017 and 2028, the decline is expected to be 14% (taking into account the inflation forecast). In view of the increasingly scarce funds, efficiency issues will therefore come even more strongly to the fore, such as the question of whether cooperation can save costs.

Between one-quarter and one-fifth of the expenses are covered by competitively acquired third-party funds. Most of these come from federal funding institutions (SNSF, Innosuisse) and from international research programmes. Private third-party funds raised in the form of private research contracts and from foundations cover around 8% of the expenditure.

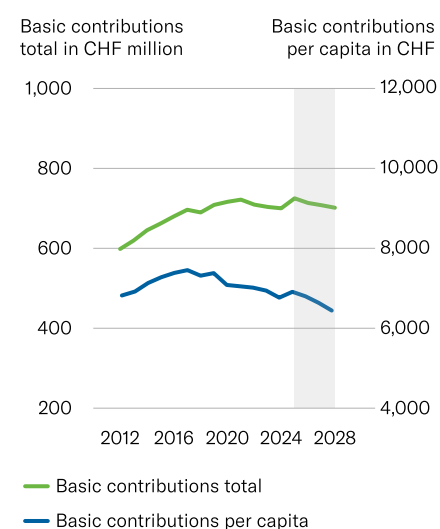
The tuition fees only cover a good 2% of the total costs. At most universities, these lie between CHF 1,000 and 1,700 per year, only at the University of St. Gallen (CHF 2,460 to 2,860) and at the Università della Svizzera italiana (CHF 4,000) are they considerably higher. Most higher education institutions charge higher fees for students who were resident abroad at the time they obtained their admission to university. The additional tuition fees – between CHF 300 and 4,000 per year – can be explained by the higher administrative costs on the one hand, and on the other hand by the funding gap created by the university cantons due to the lack of IUV contributions. Within a higher education institution, tuition fees are generally the same for all fields of study.

However, as the costs of the individual degree programmes vary widely (→ *Student-teacher ratios and costs by field of study*, page 232), the contribution of students to the costs of their studies is also very different (→ Figure 244). With tuition fees of CHF 1,600 per year, students contribute between 2 and 17% of the costs of the teaching (basic education), depending on the field of study.

243 Development in basic contributions, 2012–2028

Basic contributions 2012–2024 and (grey background) the planned values for 2025–2028 (as of July 2025), deflated

Data: FSO, FSO (SHIS-studex), Swiss Confederation, SECO; calculations: SCCRE

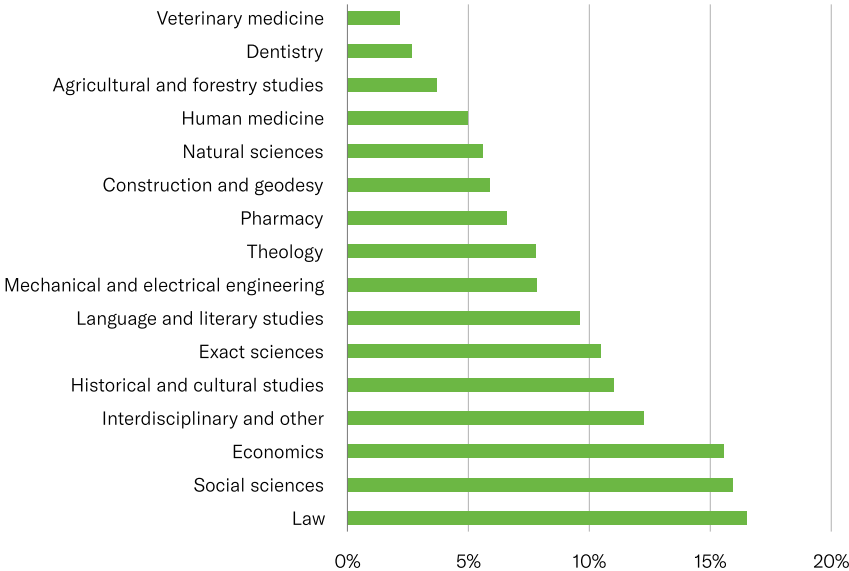


⁵ Intercantonal agreement on the contributions to the education costs of universities (Intercantonal University Agreement, IUV) of 27 June 2019.

244 Share of teaching costs borne by students with tuition fees, by field of study

For tuition fees of CHF 1,600 per year; referring to the full costs of teaching in basic education in 2023

Data: FSO; calculations: SCCRE



In view of the scarce public funds, efforts are being made to increase tuition fees – especially for international students. However, the EU is calling for a ban on discrimination for students from EU countries. An increase in tuition fees could relieve the financial burden on the public sector – or close part of the funding gap in teaching caused by the cut in public resources – and, according to research results, increase efficiency (*Dipierro & De Witte, 2024*). However, one possible consequence of an increase in tuition fees is that children from educationally disadvantaged backgrounds would be less likely to study (*Kroth, 2015*).

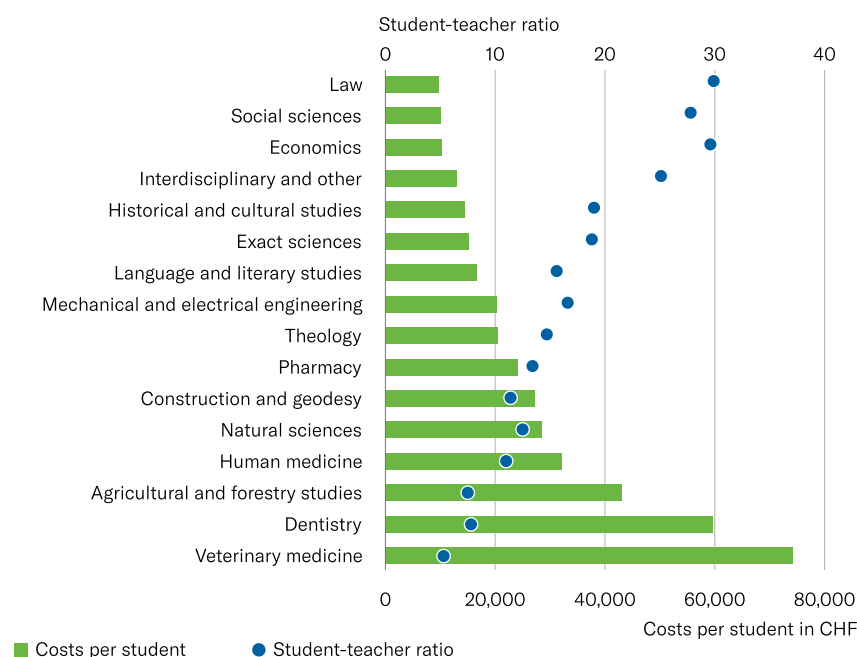
Student-teacher ratios and costs by field of study

If the **costs** for research are taken into account in addition to those for teaching, the annual expenditure per student ranges from CHF 18,000 (law) and CHF 150,000 (agricultural and forestry sciences).

The annual teaching costs per student vary widely depending on the field of study. The expenditure ranges from around CHF 10,000 (law, social sciences and economics) to CHF 74,000 (veterinary medicine) (→ Figure 245). Projected to the total duration of a Bachelor’s and Master’s degree programme of six to seven years on average, the public sector contributes between CHF 50,000 (law) and more than CHF 480,000 (veterinary medicine).

245 Costs by field of study, 2023

Data: FSO



Costs per student

Annual costs for teaching (basic education and training) per student

Student-teacher ratio

Number of students per FTE on the academic teaching staff (basic education and training)

Basic training includes the Bachelor's and Master's levels.

The differences in costs between the fields of study can largely be explained by the different student-teacher ratios. It is difficult to ascertain what the optimal ratio would be for individual subjects or how far individual subjects and universities are from this optimal ratio. Consequently, the question remains of whether the same results could be achieved with less intensive teaching or whether the student-teacher ratio in certain fields of study should actually be stepped up in order to facilitate more effective education. In general, there are indications that larger classes are associated with lower grades (*Kara et al., 2021*).

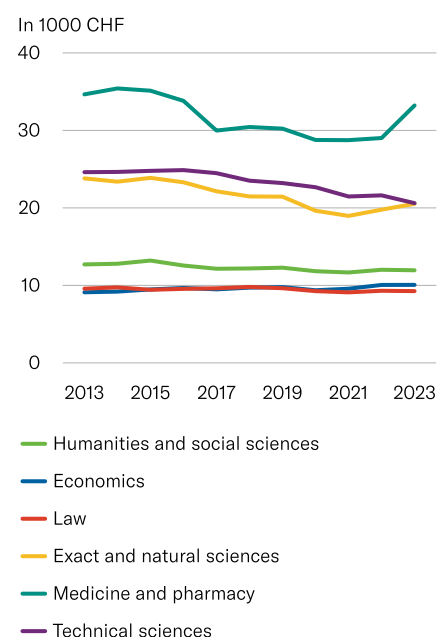
The costs per student in the technical sciences as well as in the exact and natural sciences have fallen since 2013 (→ Figure 246). The cost reduction can be explained by a substantial reduction in student-teacher ratios (more students per academic staff) in the exact sciences as well as in mechanical and electrical engineering (→ Figure 247). In the field of medicine and pharmacy, costs fell in 2017 and rose again in 2023, which is largely attributable to human and veterinary medicine. A change in the allocation to the cost units can partially explain the recent increase in costs.

Changes in student-teacher ratios are related, among other things, to the development of student numbers; for example, the sharp increase in student numbers in the exact sciences over the last ten years led to a deterioration in student numbers of student-teacher ratios. Conversely, the decline in student numbers in the humanities subjects resulted in an improvement in student-teacher ratios in these subjects, although this was not the intention based on educational reasons. The challenge is to identify unnecessary cost drivers while at the same time providing the necessary resources for high-quality teaching.

246 Development in costs per student by field of study group, 2013–2023

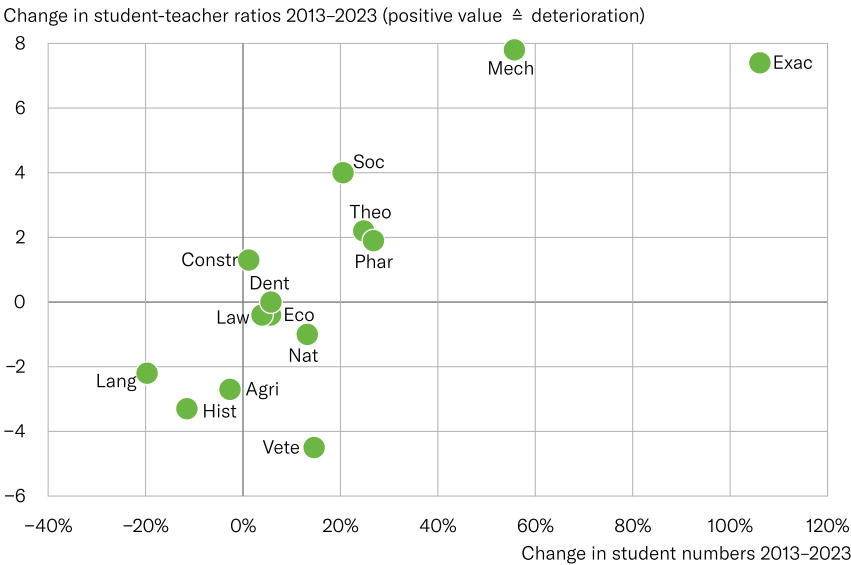
Costs for teaching (basic education) per student in basic education (adjusted for inflation)

Data: FSO; calculations: SCCRE



247 Change in student numbers and student-teacher ratios, 2013–2023

Data: FSO; calculations: SCCRE



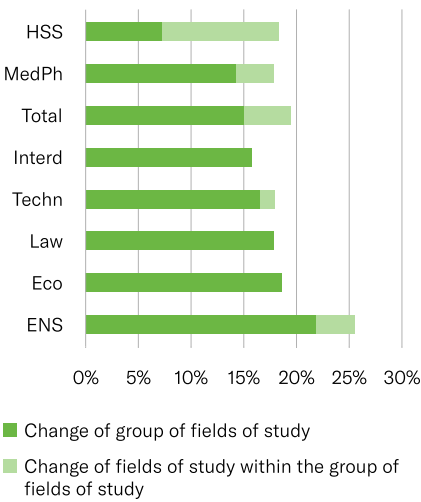
Reading example

Between 2013 and 2023, the number of students in the social sciences increased by 20% and the student-teacher ratio worsened by just under four students per academic staff.

248 Rate of change of field of study at Bachelor’s level

By field of study group at the time of admission; persons who completed their Bachelor’s degree in 2022 or 2023 (first degrees only)

Data: FSO (LABB); calculations: SCCRE



- Eco Economics
- ENS Exact and natural sciences
- HSS Humanities and social sciences
- Interd Interdisciplinary and other
- MedPh Medicine and pharmacy
- Techn Technical science

Change of subject and length of course

On average, one in five students changes field of study over the course of their Bachelor’s degree program. However, the change rate varies greatly between the individual field of study groups (→ Figure 248). In the humanities and social sciences – a field that encompasses many different fields of study – there are also several changes within the study group itself. Students studying a special subject at their baccalaureate school that is not closely related to the subject of study and students from cantons with a higher baccalaureate rate have a higher risk of changing subject area (*Diem, 2016, 2024*). It is also clear that poorer baccalaureate grades are associated with a higher probability of a change of subject (*Diem, 2021, 2024*). The switching rates have also proven to be relatively stable over time (*Diem, 2021; Nennstiel & Brosy, 2023*).

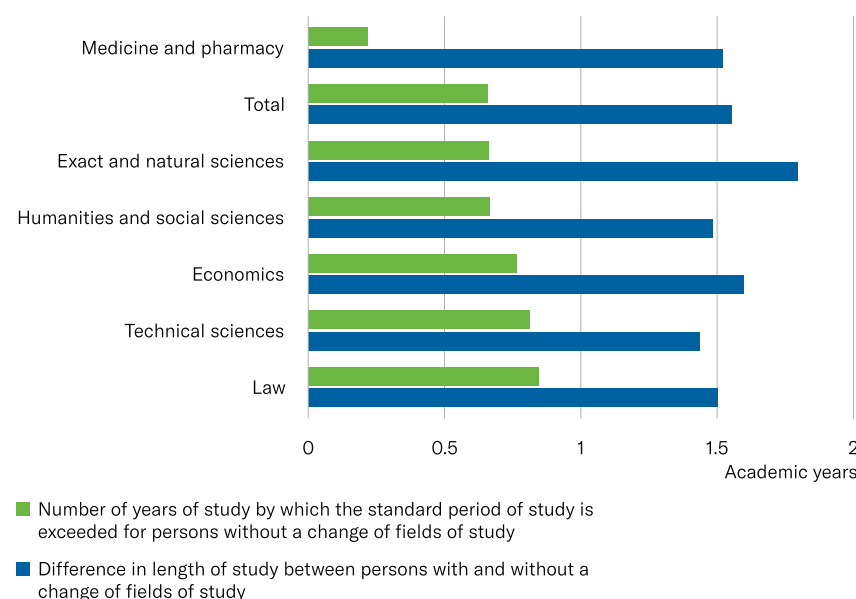
A change of subject can make sense if it prevents dropping out of studies. However, it can also lead to a longer duration of studies and thus to higher costs if the academic achievements acquired in the original subject cannot be credited in the new subject. Evaluations of the data from the FSO programme “Longitudinal analyses in the field of education (LABB)” show that the duration of the study at Bachelor’s level, with around four years, is on average about one year above the standard period of study. Separate evaluations for Bachelor’s graduates with and without a change in field of study show that even students without a change exceed the standard period of study by an average of 0.2 to 0.8 years of study, depending on the group of fields of study (→ Figure 249). Possible reasons for this include repeating courses, modules or years of study, changing the direction of study within the field of study or studying part-time (→ *chapter Tertiary-level education,*

page 189). Students who have changed their field of study need another year and a half longer than those who have not changed their field of study. The observation that baccalaureate students with a delayed start of studies change their field of study less frequently than those with a seamless start of studies (Diem, 2024) indicates that more time for choosing a course of study can reduce the probability of changing the field of study.

249 Length of study at Bachelor's level

By field of study group at the time of graduation; persons who completed their Bachelor's degree in 2022 or 2023 (first degrees only)

Data: FSO (LABB); calculations: SCCRE



Definition of study duration

Time between first admission to a Bachelor's degree at a UNI and first Bachelor's degree at a UNI.

Evaluation of the course of study

Students start their studies with certain ideas and expectations. However, the realities during the course of study or upon admission to the labour market may deviate from the original ideas – especially if the choice of course of study was made based on limited information. If graduates of Bachelor's and Master's programmes are asked one year after completing their studies whether they would choose the same course of study again, one in five people answers that they would no longer choose the same field of study. This proportion seems quite high – bearing in mind the fact that around one-fifth of students have already corrected their original choice of course of study during the Bachelor's degree program. However, this high share is not only a phenomenon at universities, it is also found at universities of applied sciences (→ *chapter Universities of applied sciences, page 243*).

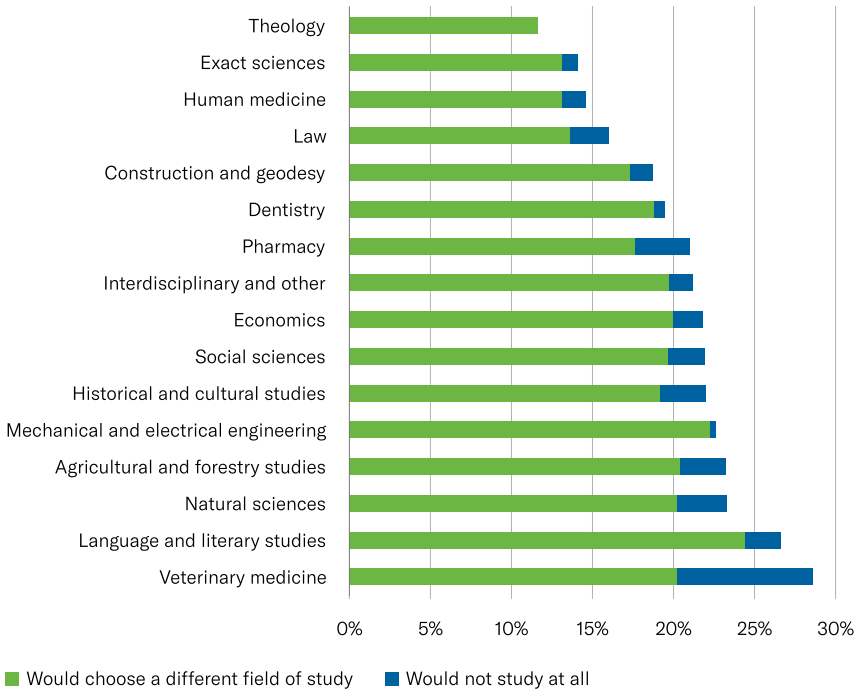
There are no major differences between Bachelor's and Master's graduates. However, the share of persons who would no longer study the same field of study varies widely by field of study (→ Figure 250). The highest shares are found in language and literary studies as well as in mechanical and engineering sciences. Theology, human medicine and the exact

sciences have the lowest preference for another subject. The share of those who would no longer study at all is 2%, with this share being by far the highest among veterinary medicine graduates.

250 Share of persons who would no longer choose the same subject

Bachelor's and Master's degree cohorts 2022

Data: FSO (EHA); calculations: SCCRE



Equity

Equal opportunities in university education are considered below using access to and participation in education as the criteria. It looks at disparities between men and women as well as differences in social origin and migration background.

Gender differences

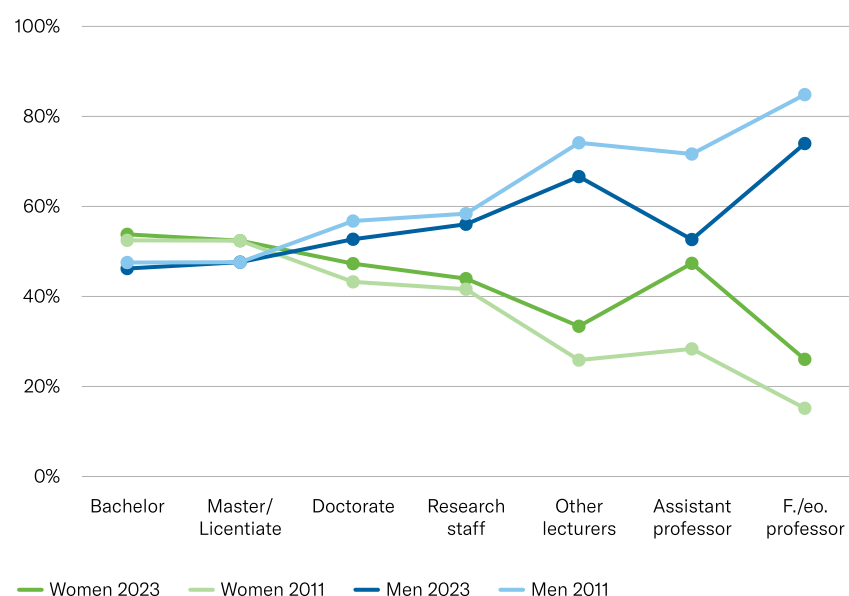
Measured against the total number of students at universities, the gender distribution is largely balanced, with women slightly outnumbering men (2024/25 academic year: 52%). However, the choice of subjects is highly gender-specific. Men are significantly over-represented, especially in the exact sciences and engineering sciences, while women are significantly over-represented in the language, literature and social sciences, in dentistry and veterinary medicine as well as in pharmacy. Over the past 25 years, the share of women has increased steadily, while gender segregation has not decreased (→ Figure 251). Today, the distribution of the two genders tends to be even more unequal across the fields of study than it was 25 years ago. To

investigate the explanatory factors for gender-specific study preferences, a Swiss study (*Combet, 2024*) conducted a choice experiment in which baccalaureate students had to choose between two subjects that differed in certain characteristics. The results show that the characteristics of thinking style (abstract versus creative) and affinity for work tasks (technical versus social) have the greatest impact on gender-specific choice of study. The intensity of mathematics, the competitive climate and the subsequent work-life balance also have a certain influence. On the other hand, materialistic characteristics such as later income or career status cannot explain the gender-specific differences. Results of a German field experiment on the effect of intensive student counselling on the choice of studies also suggest that prospective students are more likely to opt more frequently for a gender-atypical subject after intensive student counselling (*Erdmann et al., 2023*).

While the majority of Bachelor's and Master's degrees are obtained by women, the gender ratio is reversed at subsequent levels. The share of women decreases as academic career progresses (leaky pipeline). This applies in particular to the highest career levels (→ Figure 252): The proportion of women drops from 47% and 44% for Doctorates and research associates (with a Doctorate) to 33% and 32% for other lecturers and associate professorships and finally to 23% for full professorships (total f./eo. professors: 26%). By contrast, the gender ratio is surprisingly balanced among assistant professorships (47%), which can be interpreted as a result of efforts to increase the proportion of women in professorships. Based on a cross-sectional view, the leaky pipeline partially reflects previous inequalities. The actual differences in the chances of transition and success are therefore likely to be somewhat smaller overall. For persons with a Doctorate, it can be shown that a similarly high proportion embark on a post-doctorate (*FSO, 2023d*). Although the transition rate of postdocs to a Swiss professorship is somewhat higher for men, it is no longer statistically significant after taking other variables into account (*FSO, 2023d*).

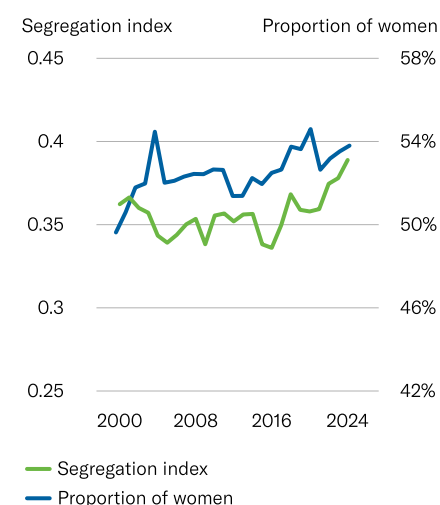
252 Leaky pipeline: Gender ratios pursuing an academic career, 2011 and 2023

Data: FSO (SHIS-studex, SHIS-PERS), swissuniversities; calculations: SCCRE



251 Share of women and gender segregation at study intake, 2000–2024

Data: FSO; calculations: SCCRE



The **segregation index** (Duncan or dissimilarity index) measures how many persons would have to change their field of study in order to achieve a balanced gender distribution. The value range is between 0 (even distribution) and 1 (total segregation).

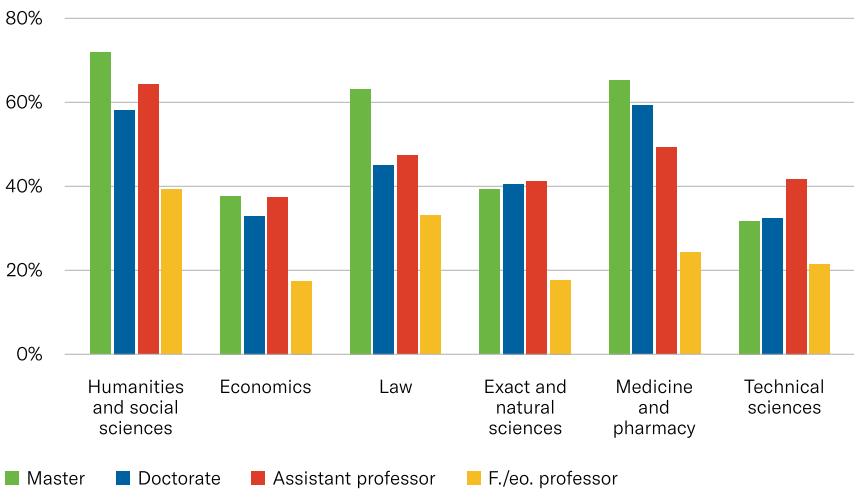
The category "full/extraordinary professorship" comprises full, extraordinary and associate professors. Only persons with a degree of employment of at least 50% are included in the 2011 data in this category. In addition, the associate professors were entered in the category of "assistant professor" with a temporary appointment in 2011. The category "research associates" only includes persons with a Doctorate.

The figures show the gender ratios in 2011 and 2023 (cross-sectional view) and not the results of a specific cohort. The actual chances of transition and success are therefore likely to be less uneven than shown in the chart.

An examination of the possible explanatory approaches of the leaky pipeline argues against the thesis that women are disadvantaged or discriminated against due to their minority position (Osterloh & Rost, 2025). The results rather suggest that the decreasing share of women over the course of their career is due to self-selection effects. This shows that men and women have different career motivations, family needs and resources depending on the field of study, which lead to different careers in the various fields of study and to different degrees of leaky pipelines. However, it cannot be ruled out that self-selection is also influenced by perceived obstacles, such as the difficulty of reconciling an academic career with care work.

253 Share of women by field of study and position in academic career, 2023

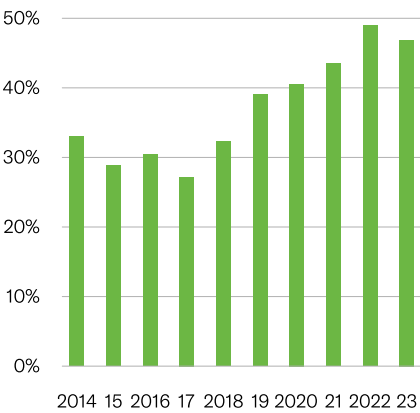
Data: FSO (SHIS-studex, SHIS-PERS); calculations: SCCRE



The figures show the gender distribution in 2023 (cross-sectional view) and not the results of a specific cohort. The actual chances of transition and success are therefore likely to be less uneven than shown in the chart.

254 Share of women in new appointments, 2014-2023

Data: FSO (SHIS-PERS); calculations: SCCRE



A new appointment is the first appointment of a person at professorship level (including assistant professorship/associate professorship).

Considering the entire academic career from a Master’s degree to an extraordinary or full professorship, the share of women falls most sharply in the field of medicine and pharmacy (→ Figure 253). In all fields of study, the share of women increases at the transition to the last level (full/extraordinary professorship). In the fields of humanities and social sciences dominated by women and in law, the share of women also falls sharply between the Master’s and Doctoral levels.

For many years, the goal of increasing the share of women with professorships has been pursued with federal programmes and specific funding instruments. As the development of gender relations between 2011 and 2023 shows (→ Figure 252), this has been achieved at least in part. In the case of new appointments, the share of women increased continuously from around 30% in 2014–2017 to 47% in 2023 (→ Figure 254). This means that the share of women in new appointments is even slightly higher than in non-professional academic staff.

Social background

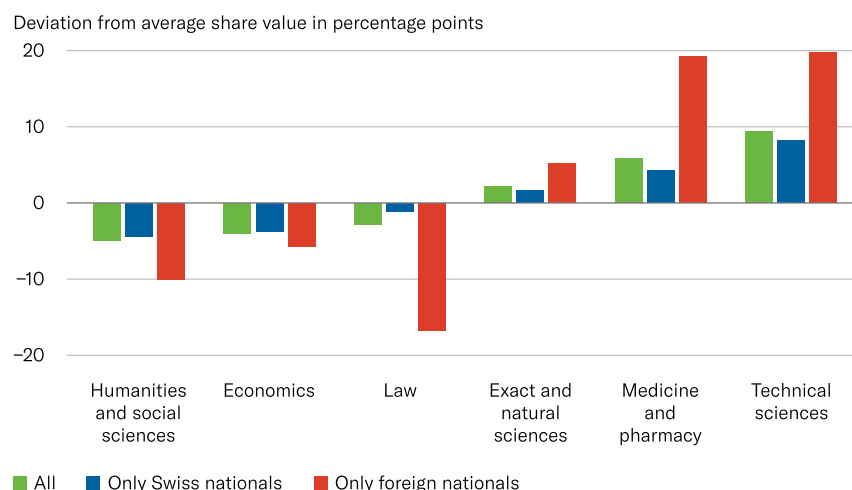
Children from academic families are much more likely to enter and successfully complete complete university studies than children whose parents did not study (→ *chapter Tertiary-level education, page 189*) (Buchmann et al., 2016; Burger, 2023; Combet & Oesch, 2021; Zimmermann & Seiler, 2019; Diem, 2024). These unequal opportunities can largely be attributed to the different educational pathways at upper-secondary level, which depend on social origin (Burger, 2023) and are partially explained by different skills at the end of compulsory education. However, social disparities exist not only in terms of the probability of starting a course of study, but also in terms of the choice of field of study (→ Figure 255). Students whose parents have a university degree are significantly more likely to choose a subject in the fields of medicine, pharmacy and technical sciences and less likely to choose a subject in the humanities, social sciences and economics than students whose parents have not studied. Among students of foreign nationality, the subject preferences are even more pronounced depending on the parents' educational background, although here the low preference of academic children for studying law is also noticeable.

Regardless of the parents' educational background, study results show that students often follow their parents' choice of subject, especially that of the same-sex parent (Altmejd, 2024). As labour market opportunities differ depending on the field of study, inequalities in the choice of field of study can lead to unequal labour market opportunities later on.

255 Choice of subject depending on parents' educational qualifications

Deviation of the share of students whose parents have a university degree from the average;
Bachelor's degree admissions 2020–2023

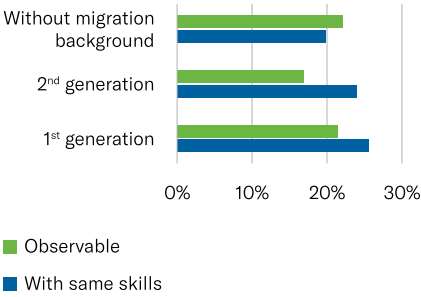
Data: FSO (LABB); calculations: SCCRE



The proportion of students whose parents have a university degree is 55% for Swiss nationals and 57% for foreign nationals; the overall average is 55%.

256 Admission rates at UNI by migration background

Data: FSO (LABB), EDK (ÜGK 2016);
calculations: SCCRE



Migration background

Persons with a migration background are underrepresented at universities, with second-generation migrants in particular less likely to study at university (→ Figure 256). However, the lower probability of studying at a university is mainly due to the (weaker) skills the individual acquired by the end of compulsory schooling. With the same skills at the end of compulsory education, first- and second-generation migrants are even more likely to study at university than persons without a migration background (*Burger, 2023*). This finding is consistent with the explanation that, on average, they have higher educational aspirations and a stronger preference for general education schools (*Abrassart et al., 2020; Kamm et al., 2023a, 2023b*). Findings from Germany show the following: Some of the differences can be explained by the fact that persons with a migration background are more optimistic and that they have information deficits with regard to vocational education and training (*Neumeyer & Will, 2024*).

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

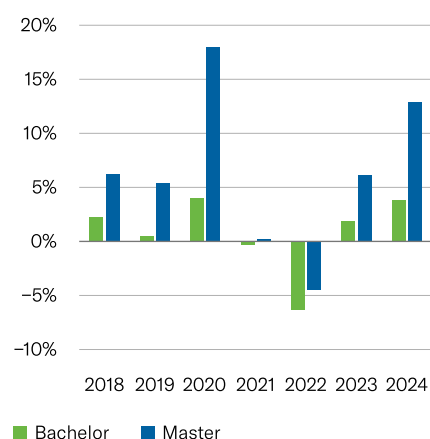
UNIVERSITIES OF APPLIED SCIENCES

The **facts and figures** in this chapter refer only to the UAS; teacher training and the universities of teacher education (UTE) integrated into the UAS are not taken into account. These are dealt with in the *chapter Universities of teacher education* (page 269). Continued education and training is addressed in the *chapter Continuing education and training* (page 321).

257 Change in the number of admissions

Compared to previous year

Data: FSO (SHIS-studex); calculations: SCCRE



Context

Teaching is part of the core mission of the universities of applied sciences (UAS). The number of enrolled students is therefore of paramount importance as the universities of applied sciences need to make appropriate adjustments to their course offering – not only the infrastructure and individual lectures but also the staffing. The funding provided to higher education institutions is highly dependent on student numbers (→ *chapter Tertiary-level education*, page 189; → *Efficiency/costs*, page 261).

Demographics and intake of universities of applied sciences

The number of students depends on many factors. A key indicator is the number of persons who have completed a federal vocational or specialised baccalaureate or an academic baccalaureate; it depends on demographics and the provision of schools at upper-secondary level. Another important factor is the transition rate to universities of applied sciences, which is influenced by the economic situation and competition on the labour market (Bächli & Tsankova, 2023). Other factors include the number of students entering with other Swiss or foreign admission qualifications, the duration of the (Bachelor's) course and the transition rates from the Bachelor's to the Master's studies.

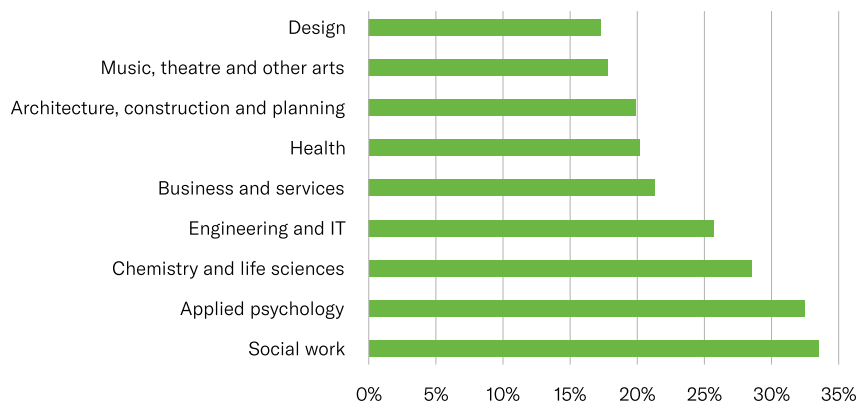
Overall, the development of the various factors has led to a steady increase in the number of students since the universities of applied sciences were founded. With around 78,000 Bachelor's and Master's students, a provisional high was reached in 2021, which was slightly exceeded again in 2024. However, the number of students declined in 2022 and 2023, which is due, amongst other things, to the fact that the number of federal vocational baccalaureates has hardly increased since the mid-2010s and even declined significantly in 2022 and 2023. In addition, the COVID-19 pandemic also had an impact on the number of new students, particularly at Master's level. In 2020, the number of Master's admissions rose before falling significantly again in 2022 (compensation effect) (→ Figure 257). At Bachelor level, the impact of the COVID-19 pandemic was significantly lower and the number of admissions increased only moderately. The decline in admissions at Bachelor level in 2022 is primarily due to the fact that fewer federal vocational baccalaureates, academic baccalaureates (2021) and specialised baccalaureates (2022) were counted.

However, the impact of short-term fluctuations in recorded baccalaureate qualifications on the number of UAS admissions is weakened by the fact that many persons only start studying at a university of applied sciences after a certain time lag. On admission to a course of study at a university of applied sciences, just under a quarter of students are 25 years of age or older, although the share varies widely depending on the field of study (→ Figure 258). Higher shares of older students can be found in particular in fields of study that offer part-time courses of study. Within a field of study, the share of older students amongst persons with an academic baccalaureate and (system-related, due to the still new training programme) a specialised baccalaureate is generally lower, while it is highest amongst persons without a Swiss baccalaureate.

258 Share of students aged 25 and older at Bachelor degree intake, 2023

Resident in Switzerland prior to commencement of studies; fields of study with at least 500 admissions

Data: FSO (LABB); calculations: SCCRE



Forecast for student numbers

For the development of student numbers up to 2033, the Federal Statistical Office (FSO) assumes in its reference scenario that the number of federal vocational baccalaureates, the transition rate to universities of applied sciences after the federal vocational baccalaureate and the number of admissions with an academic baccalaureate or with another Swiss or foreign qualification will increase (FSO, 2024a). It is also assumed that the number of admissions to Master's level will likewise increase. Overall, an increase in student numbers of 18% or just under 14,000 students is expected between 2023 and 2033 (→ Figure 259). Depending on which assumptions are made regarding the growth factors, growth could also amount to just 12% ("low" scenario) or 24% ("high" scenario), which illustrates the uncertainty surrounding future development. In absolute terms, the "high" and "low" scenarios differ by around 9,000 students in 2033, which is the equivalent of 12% of the student numbers in 2023. Regardless of the scenario, the student numbers will rise significantly over the next few years, which will lead to higher education costs (→ *Efficiency/costs*, page 261). In addition, the infrastructure will need to be expanded if the overcapacity is not to be absorbed by distance learning. In order to maintain consistent student-teacher ratios in the "high" scenario, 1,400 new full-time positions (+24%) would need to be created. On the other hand, if the headcount remained the same, the student-teacher ratio would increase from 13 students per full-time equivalent (FTE) of the academic staff to 16.1.

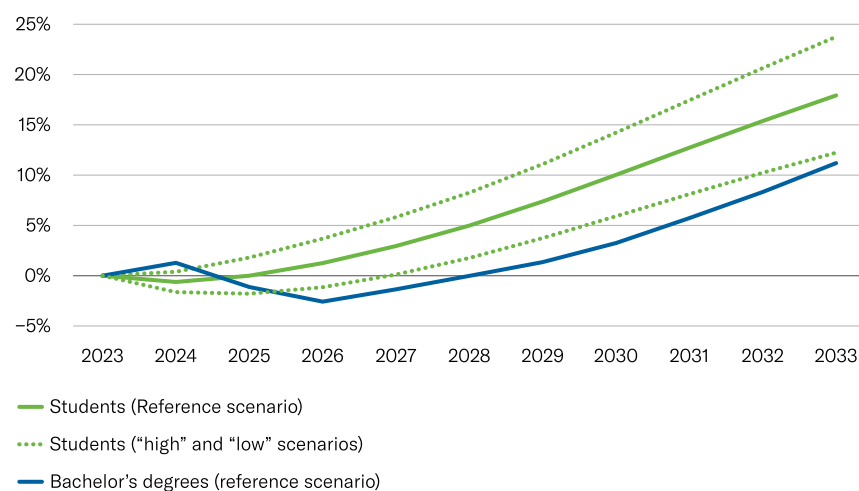
Due to the development of student numbers in the early 2020s, the number of Bachelor's degrees is expected to stagnate between 2024 and 2029 or even decline in individual years. An increase can only be expected again following this. By contrast, growth is expected for Master's degrees over the entire period.

In 2023, the **student numbers** came to about 64,000 persons at Bachelor level and 13,000 at Master level (total: 77,000 students).

259 Forecast development of student numbers and graduations, 2023–2033

Change compared with 2023

Data: FSO; calculations: SCCRE



Restructuring of universities of applied sciences

Until the early 2020s, the ZHAW, the ZHdK and the Zurich University of Applied Sciences (HWZ) were merged under the umbrella of the Zurich University of Applied Sciences (ZFH). The University of Applied Sciences of the Grisons (FHGR, formerly the University of Applied Sciences in Chur [HTW]) and the Eastern Switzerland University of Applied Sciences (OST) were jointly run as the University of Applied Sciences of Eastern Switzerland (FHO) until 2019.

Institutions

According to the Federal Act on Funding and Coordination of the Higher Education Sector (HEdA)¹, the current landscape of universities of applied sciences includes nine public-law universities of applied sciences, one private university of applied science (Kalaidos) and six institutes of applied sciences accredited under the Higher Education Act² (as of July 2025). Most universities of applied sciences consist of several subschools that are geographically distributed across different locations and usually have their own management and administration.

The individual universities of applied sciences vary considerably in size (→ Figure 260). Only 2 to 3% of students are enrolled at the three smallest universities of applied sciences – Kalaidos, the University of Applied Sciences of the Grisons (FHGR) and the Zurich University of the Arts (ZHdK). By far the largest university of applied sciences is the Haute école spécialisée de Suisse occidentale (HES-SO), which was founded as a joint university of applied sciences of all the cantons in Western Switzerland, followed by the Zurich University of Applied Sciences (ZHAW). In total, only 1% of students are enrolled at the six institutes of applied science.

The two largest fields of study – economics and services (31%) and engineering and IT (18%) – as well as the fields of study of architecture, construction and planning (5%) are offered by all public universities of applied sciences with the exception of the ZHdK. All other fields of study can only be studied at specific universities, where the fields of

¹ Federal Act on Funding and Coordination of the Higher Education Sector (HEdA) of 30 September 2011.

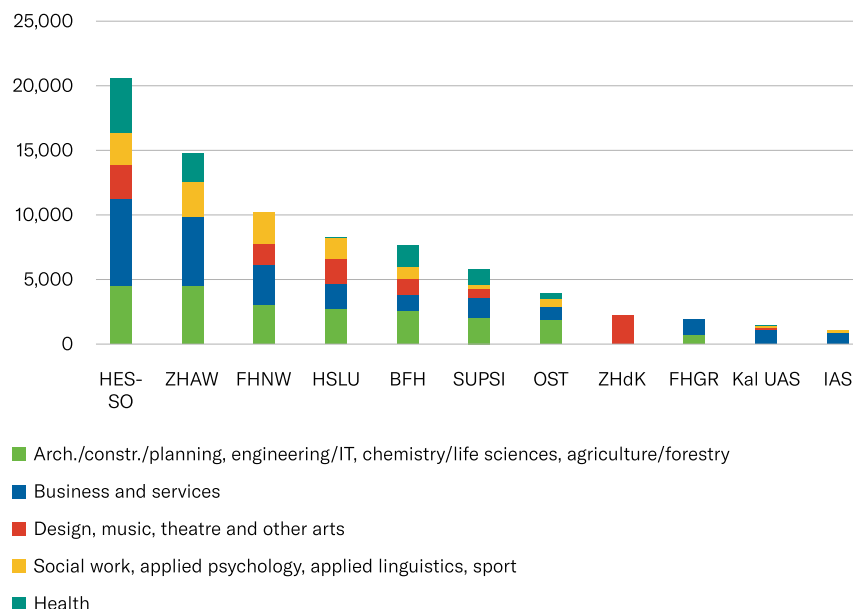
² The Swiss Federal Institute of Sport Magglingen (SFISM) is a public-law institution. The other institutes of applied science – University of Applied Sciences in Business Administration Zurich (HWZ), Swiss Business School (SBS), Les Roches Global Hospitality Education, César Ritz Colleges Switzerland and Swiss UMEF – are private institutions.

study of agriculture, forestry, sport and applied linguistics are only available at one or two universities of applied sciences or institutes of applied sciences.

260 Number of students by university of applied sciences, 2024/25

Excluding continuing education and training students

Data: FSO



HES-SO	Haute école spécialisée de Suisse occidentale
ZHAW	Zurich University of Applied Sciences
FHNW	University of Applied Sciences and Arts Northwestern Switzerland
HSLU	Lucerne University of Applied Sciences and Arts
BFH	Bern University of Applied Sciences
SUPSI	Scuola universitaria professionale della Svizzera italiana
OST	Eastern Switzerland University of Applied Sciences
ZHdK	Zurich University of the Arts
FHGR	University of Applied Sciences of the Grisons
Kal UAS	Kalais University of Applied Sciences
IAS	Institutes of Applied Sciences

If the development of the student shares of the individual universities of applied sciences between 2014 and 2024 is considered, it can be seen that the market share of the HES-SO fell the most sharply (→ Figure 261). A decline in the share of students can also be observed at the OST, the Bern University of Applied Sciences (BFH) and the ZHdK, while the other universities of applied sciences were able to expand their market share.

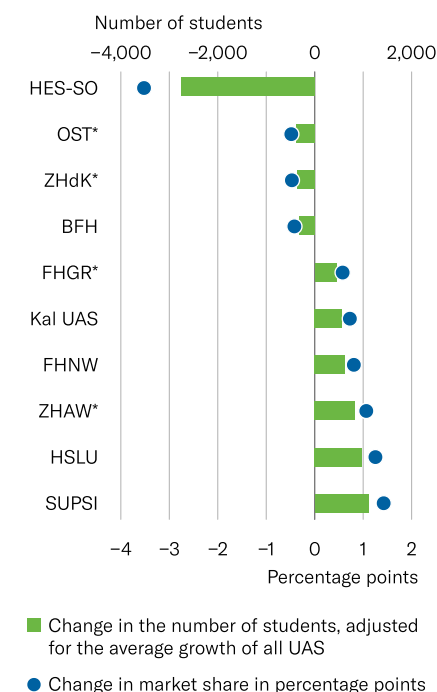
Admissions and departures of students

The slight overall shifts in the market shares of the individual universities of applied sciences may obscure the fact that they compete between one another for students. This becomes clear when one considers the admissions of students from outside the supporting region (incoming) and the departures of students from the supporting region (outgoing). Additions and departures can indicate expected or perceived differences in the quality of education or the appeal of a higher education institution in general. However, they are also important for the individual universities of applied sciences and supporting regions given that student numbers remain constant overall, as they have an impact on funding (→ *Efficiency/costs, page 261*).

Three universities of applied sciences – the Lucerne University of Applied Sciences and Arts (HSLU), the FHGR and the ZHAW – recorded positive balances for the four largest fields of study, which are offered in all supporting regions (with the exception of the social work degree programme

261 Change in market shares, 2014–2024

Data: FSO (SHIS-studex); calculations: SCCRE



* The change compared to their predecessor schools was calculated for OST, FHGR, ZHdK and ZHAW.

in the canton of Grisons) and together account for around two-thirds of all students (→ Figure 262). At these universities of applied sciences, the number of students from outside the supporting region (incoming) exceeds the number of students studying at a university of applied sciences outside the supporting region (outgoing). OST loses the most students, which is mainly attributable to the area of economics and services. At the HES-SO, the negative balances can be partly explained by the fact that the French language is uncommon outside the supporting region, while conversely, German is also spoken in two supporting cantons of the HES-SO.

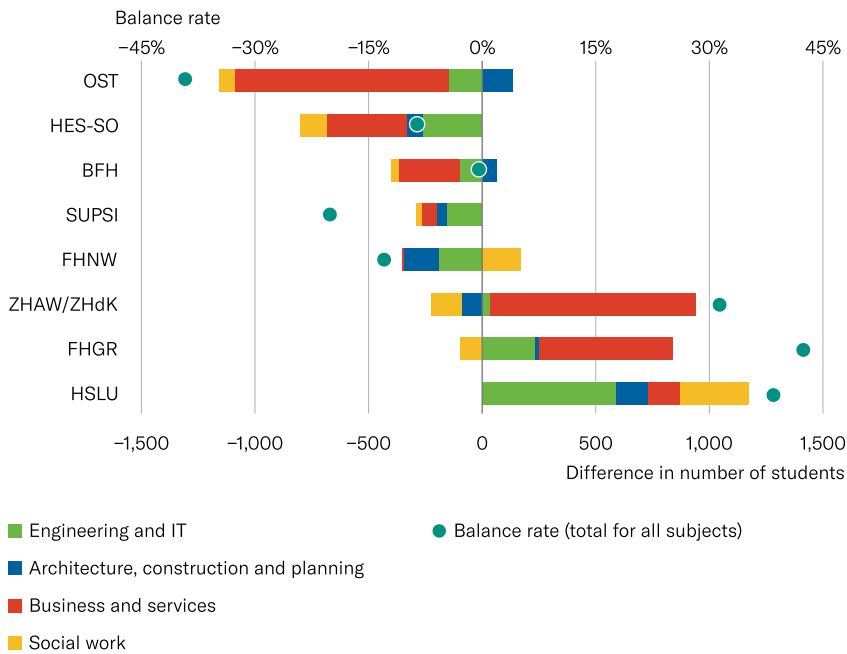
262 Difference between student admissions and departures by university of applied sciences, 2024

Only students resident in Switzerland prior to starting the course

Data: FSO (SHIS-studex); calculations: SCCRE

The **balance rate** indicates, as a total for all fields of study, the difference between the number of students from outside the supporting region (incoming) and the number of students from the supporting region who study outside (outgoing) relative to the number of students from the supporting region.

The calculations do not include private subschools or subschools financed by foundations (e.g. Swiss Distance University of Applied Sciences, which is part of SUPSI). In the cantons that are sponsors of two universities of applied sciences (Bern and Schwyz), the students were allocated to the two respective universities of applied sciences according to their distribution.



The picture presented by the positive and negative balances are largely confirmed if all fields of study are included in the comparison and if the differences between admissions and departures are considered in relation to the number of students from the region of origin. In general, a broad range of subjects has a positive effect on the net migration, which explains the lower negative balance rate of the BFH compared to the University of Applied Sciences Northwestern Switzerland (FHNW) when all fields of study are taken into account. The value of the balance rate also depends on the size of the university of applied sciences and its supporting region. Of the two universities of applied sciences in Italian-speaking Switzerland, the Scuola universitaria professionale della Svizzera italiana (SUPSI) loses a considerably larger share of students to universities of applied sciences other than the HES-SO despite its comprehensive range of studies. Of the two Zurich universities of applied sciences, both have a positive balance.

Differences between private and public schools

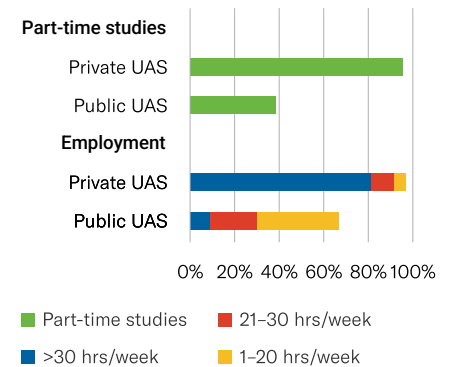
Private and public higher education institutions differ in many respects: in the funding of education, the range of courses offered and the composition of the students. As the training costs have to be covered in full by tuition fees, the private providers focus specifically on working people. They offer their degree programmes predominantly on a part-time basis and the share of classroom teaching is usually low. According to Kalaidos, with a study duration of eight semesters for a Bachelor's degree, employment of between 80 and 100% while studying is possible. Survey results show that 96% of students at private higher education institutions pursue their studies part-time (→ Figure 263). Over 80% state that they work more than 30 hours per week. This is considerably more than at public higher education institutions, even if only part-time students are taken into consideration. The question arises as to whether the quality of education can still be guaranteed with such a high level of employment. As institutional accreditation only checks the quality assurance system, it remains to be seen whether the quality of education and the requirements for students are ensured at a high level.

The self-selection of students at private schools is reflected in the composition of the students (→ Figure 264). Students at private higher education institutions are two and a half years older on average. In addition, they are less likely to come from a home where the parents have a tertiary education and more likely to have a migration background. However, some of the differences in origin can be explained by the different subjects offered.

263 Part-time studies and gainful employment while studying

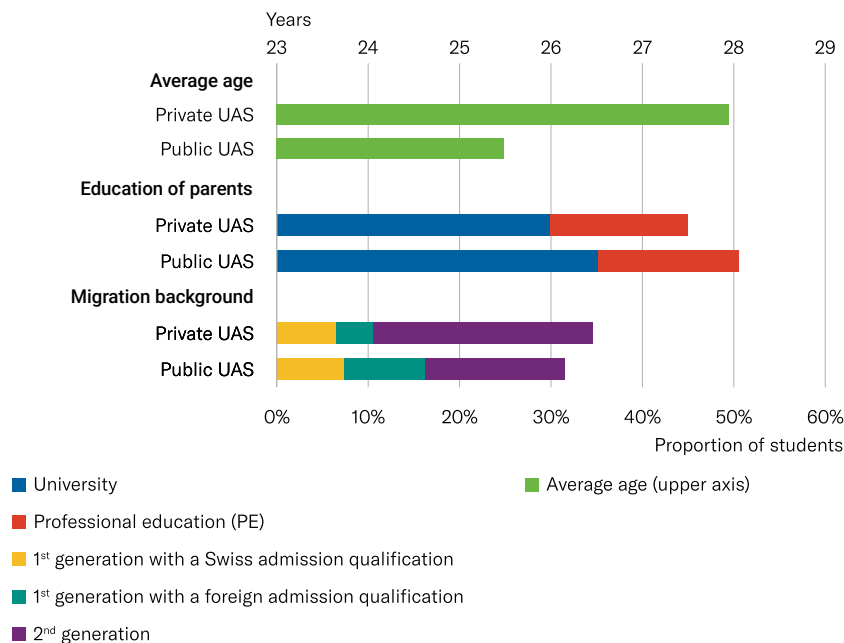
Dissemination in public and private schools

Data: FSO (SSEE 2024); calculations: SCCRE



264 Characteristics of students in private and public schools

Data: FSO (SSEE 2024); calculations: SCCRE



Practice-integrated STEM-degree

As a measure to combat the shortage of skilled workers, the universities of applied sciences have also been able to offer practice-integrated Bachelor's degree programmes (PiBS) in the STEM field since 2015. These enable persons with a baccalaureate or a federal vocational baccalaureate with a non-subject field of study to gain the requisite work experience while studying at a university of applied sciences. For this purpose, students must sign a four-year training contract with a partner company. Although the PiBS lead to a certain softening of the original admission regulations, which contradicts the aim of enhancing the profile, the number of cases is very limited.

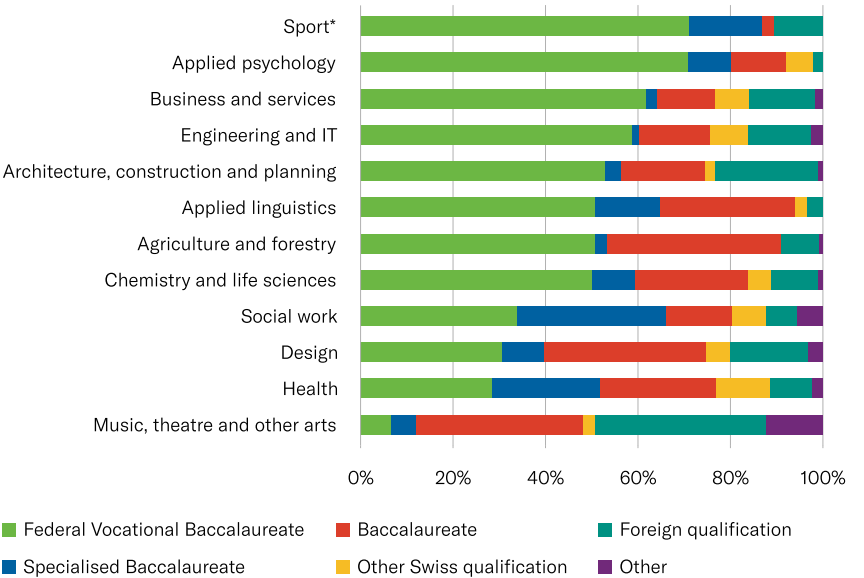
Special rules apply in the **field of study of health**: In some cases, admission is possible without prior work experience (transitional arrangement according to Art. 73 para. 3 HEdA). This provision is to be repealed in the next few years.

Admission to universities of applied sciences

The regular method of admission to universities of applied sciences is via the vocational or specialised baccalaureate. However, the Higher Education Funding and Coordination Act provides for three primary methods of admission to Bachelor's studies at a university of applied sciences (Art. 25 para. 1 HEdA): The first – considered the main path – is by means of a federal vocational baccalaureate, supplemented by a programme of vocational education and training in a vocation related to the field of study. The second route entails completing an academic baccalaureate combined with at least one year of work experience. The specialised baccalaureate in an occupational field related to the field of study is the third method of guaranteeing admission to a university of applied sciences. Other admission channels are also possible (Art. 25 para. 2 HEdA and UAS Admissions Ordinance³) (*swissuniversities*, 2015). For example, persons with a vocational or specialised baccalaureate whose occupational field is not related to the field of study of the university of applied sciences are admitted if they can prove at least one year of professional experience in an occupation related to the field of study. Another option is to complete professional education and training. The universities of applied sciences also have the option of setting additional entrance exams ⁴ and do so in many fields (applied psychology, design, health, social work, music, theatre and other arts, applied linguistics, sport); in some cases, a numerus clausus is also adopted.

265 Enrolments for a Bachelor's degree by admission qualification, 2024

Data: FSO (SHIS-studex); calculations: SCCRE



* The values are based on case numbers of <50 students.

3 Ordinance of the University Council on Admission to universities of applied sciences and institutes of applied sciences of 20 May 2021.
4 In the fields of art and applied linguistics, these tests replace the requirement to prove at least one year of work experience.

Formal admission criteria help the universities of applied sciences to develop a distinct profile. They differ from those of universities (UNI) in that they are directly accessible to persons with a federal vocational or specialised baccalaureate. At least a year of work experience is also required. Compared to professional education, in particular professional education institutions, the baccalaureate is a key differentiating feature of universities of applied sciences as a basic admission requirement.

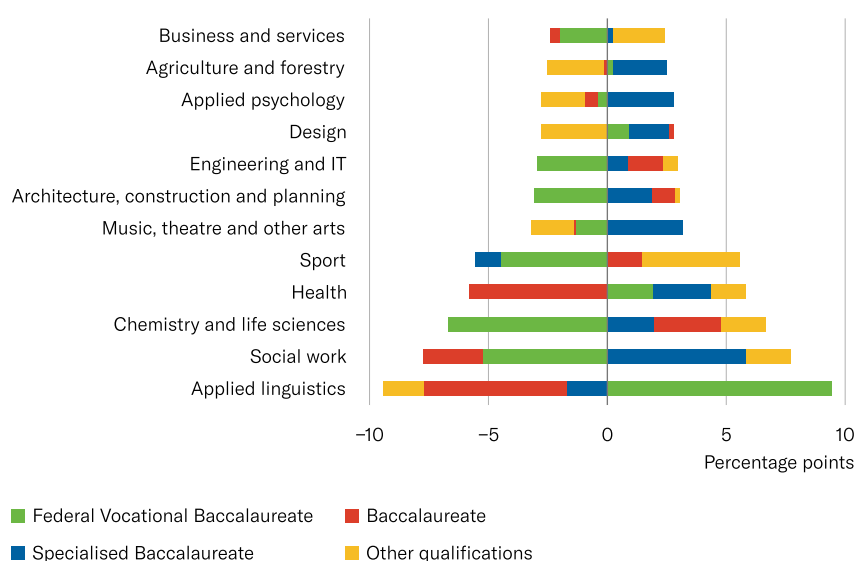
With almost 50% of all admission qualifications (or 56% of all Swiss admission qualifications), the federal vocational baccalaureate remains the most important means of access to universities of applied sciences. However, the range of admission qualifications of the recruited students is very broad and the composition of the qualifications varies widely from one field of study to another (→ Figure 265).

In the five years between 2018/2019 and 2023/2024, the share of the federal vocational baccalaureate fell by an average of 3 percentage points. The decline also affected fields of study in which the federal vocational baccalaureate is firmly anchored, such as architecture, construction and planning, engineering and IT or business and services (→ Figure 266). By contrast, there were significant increases in the federal vocational baccalaureate in applied linguistics and health. The share of specialised baccalaureates and the “other qualifications” category, about half of which consist of professional education qualifications (including the transition from a professional education institution to a university of applied sciences), have increased overall. By contrast, there was no increase in the number of academic baccalaureates. Overall, the development of admission qualifications does not indicate a softening of the profile of a university of applied sciences.

266 Change in admission qualifications on entry to Bachelor's courses between 2018/19 and 2023/24

Change based on the average for 2018 and 2019 versus 2023 and 2024; only students resident in Switzerland prior to starting the course

Data: FSO (SHIS-studex); calculations: SCCRE

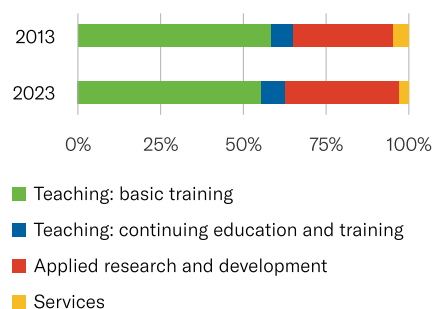


The category “other qualifications” comprises the sub-categories “other Swiss qualification”, “foreign qualification” and “other” whereby the first sub-category is by far the biggest.

267 Composition of human resources by activity type, 2013 and 2023

Measured in FTEs; without the area of administration and central services

Data: FSO



Performance mandate and profile development

Like universities and universities of teacher education, the universities of applied sciences are subject to a four-fold performance mandate. Their core tasks include education (teaching in basic education), continuing education and training, applied research and development including knowledge and technology transfer as well as services. The principal mandates of universities of applied sciences are to provide scientifically sound education of experts who can quickly make a productive contribution in the labour market and to engage in applied research and development. This is also reflected in the time spent by the staff (→ Figure 267). Over the last decade, the share of applied research and development has increased, while that of services has declined. This raises the question of whether the decline in services is partly due to the fact that corresponding commissioned work has been re-labelled as research and development. However, the observation that the number of research articles has increased during the period under consideration indicates that there is indeed more research activity. Research results also suggest that universities of applied sciences have a positive impact on labour market demand in that more high-skilled jobs are in demand in the STEM field (*Schultheiss et al., 2023*).

The pronounced practical and labour-market orientation of universities of applied sciences is one of the key differences from the teaching delivered at universities. Amongst other things, this is ensured by the practical orientation and experience of the teaching staff and via practical projects and work experience during the course of study (*Baer-Baldauf, 2020*). Compared with professional education and training, on the other hand, the teaching at universities of applied sciences is more strongly based on science and research. In the area of research, the application orientation is an important distinguishing feature from the universities, while professional education has no explicit research mandate.

Strengthening the profiles of the courses offered at the tertiary level is a declared objective of the federal government and the cantons (*EAER & EDK, 2023*; objective 4 of the joint declaration on education policy). The aim is to reinforce the characteristics of each profile and to continue seeking a sharper distinction between the individual types of HEI with a view to making them complementary to one another in teaching and research. The findings of an exploratory analysis (*SSC, 2020*) suggest that this is working, as there is little sign of convergence between universities of applied sciences and universities.

Extra-occupational study programmes and part-time studies

Offering a wide range of extra-occupational degree programmes is a characteristic feature of universities of applied sciences (→ *chapter Tertiary-level education, page 189*). In comparison with universities and universities of teacher education, the strong professional and practical orientation of the degree programmes at universities of applied sciences and their admission of persons with a federal vocational baccalaureate or professional education means that these programmes more frequently attract people who were already in employment before starting their studies and want to remain so during the course. Accordingly, the universities of applied sciences have

always offered work-study or part-time degree programmes. These programmes allow students to pursue employment or other commitments alongside their course of studies.

On average, one in three students at a university of applied sciences completes a part-time course of study. However, the share of part-time students varies widely between the fields of study (→ Figure 268). The highest shares are found in the areas of business and services as well as applied psychology. Overall, the share of part-time courses has increased by 10 percentage points since 2014, underscoring the demand for this form of study.

Evaluations of the survey on the economic and social situation of students show that three out of five students stated that they had decided to study part-time for financial reasons or because of the combination of study content and practical work. For just under two-thirds of part-time students, employment takes up more space in their lives than their studies (FSO, 2020b).

Education at Master's and Doctoral level

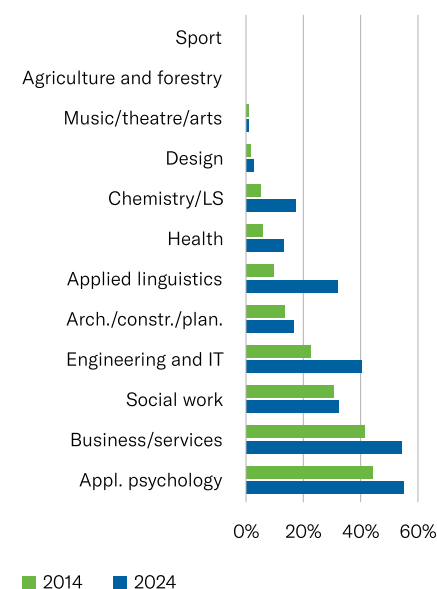
At universities of applied sciences, the Bachelor's degree is considered the standard qualification for gaining professional-level skills, with the exception of music, where the Master's degree is considered the standard qualification. However, a Master's degree is possible in all fields of study. The average transition rate to a Master's degree (within two years of completing a Bachelor's degree) is 21% (Bachelor graduates in 2021). 17% start their Master's studies at a university of applied sciences, 4% at a university of applied sciences and less than 1% at a university of teacher education (→ *chapter Tertiary-level education, page 189*). However, the demand for Master's degree programs varies widely depending on the field of study. By far the highest transition rates are to be found in the arts, sport and applied psychology (→ Figure 269). In the arts, the frequent transitions to a Master's degree can be attributed to the field of music. In applied psychology and sport, the high rate of Master's transitions can be explained by the fact that a Master's degree is required for the title of "psychologist" and for the ability to teach at lower-secondary level. Demand for Master's degree programmes in the fields of social work, health, agriculture and forestry is very low, with just under one in ten people with a Bachelor's degree starting a Master's degree. The graduate surveys also show that graduates with better final grades are more likely to embark on a Master's degree than those with lower grades.

The transition rate to a Master's degree program has increased in recent years, specifically by an average of 4 percentage points between the 2012 and 2021 Bachelor's degree cohorts. The increase in the transition rate can be seen in all fields of study except for the arts and applied linguistics.

268 Share of part-time students by field of study, 2014 and 2024

On admission to the Bachelor's course; part-time students including extra-occupational students

Data: FSO (SHIS-studex); calculations: SCCRE

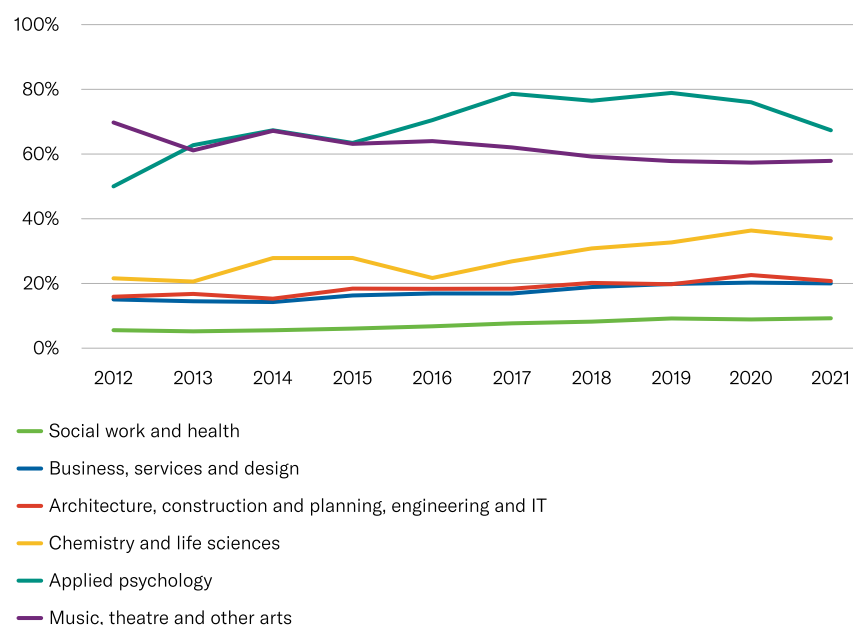


LS Life Sciences

269 Transition rate to a Master's degree programme

In the two years following graduation from a UAS bachelor's degree, 2012–2021; including transitions to a Master's degree from a UNI or UTE; only selected fields of study

Data: FSO (LABB); calculations: SCCRE



Some of the Bachelor's graduates continue to qualify in professional education and training. Of those who graduated in 2013 and 2014, 7.5% began a corresponding training in the following eight to nine years. The shares in turn vary widely by field of study. The highest rates can be found amongst graduates in the fields of business and services (12%). A further 2% of Bachelor's graduates started further studies in a Bachelor's degree at a university.

Only universities are entitled to award the highest academic achievement, i.e. a Doctorate.⁵ However, universities of applied sciences are able to offer Doctoral courses in collaboration with a university. This cooperation enables universities of applied sciences to train their young scientists with a specific UAS profile by helping to design the education and training and by ensuring practical and application-oriented research. At the same time, the involvement of universities guarantees access to scientific research at the universities as well as high scientific standards.

To promote these forms of cooperation, the Swiss Conference of Higher Education Institutions (SHK) has been supporting Doctorate courses since 2017 through project-related contributions based on cooperation between a university of applied sciences and a university. This collaboration can be with either a Swiss or a foreign higher education institution (for fields of study where Swiss universities are not well established). However, due to the federal government's cost-cutting measures, the financial resources for the contribution period 2025–2028 could only be committed for the years 2025 and 2026.

⁵ University Council Ordinance on the Coordination of Teaching at Swiss Higher Education Institutions of 29 November 2019.

Effectiveness

The primary aim of the teaching at universities of applied sciences is to turn out students who are qualified for the labour market, which requires the application of academic knowledge and methods plus design and artistic skills (see Art. 26 Paragraph 1 HEdA). The Qualification Framework for the Swiss Higher Education Sector (nqf.ch-HS) sets out the minimum skills that students should have at the end of their studies (*swissuniversities, 2021a*). So far, neither national nor international tests exist that can be used to review the stated skills in a standardised manner for Switzerland. Nevertheless, indicators of labour market integration are used to obtain clues as to the effectiveness of UAS education. These indicators may not represent the skills directly, but they can provide information as to whether there is demand in the labour market for the skills acquired at the higher education institution. Analyses of the return on education can be found in the *chapter Cumulative effects* (page 347).

Moreover, the effectiveness of the education is also measured using the indicator “success rate” or “drop-out rate”. However, this can equally only be interpreted as a measure of skills with reservations: On the one hand, academic success can be controlled by the higher education institutions independently of the skills achieved; on the other hand, it also depends on factors that cannot be influenced by the higher education institutions. Other indirect indicators of the effectiveness of education are the evaluation of the degree programme from the perspective of the graduates and the value of non-cognitive skills.

Evaluation of the course of study

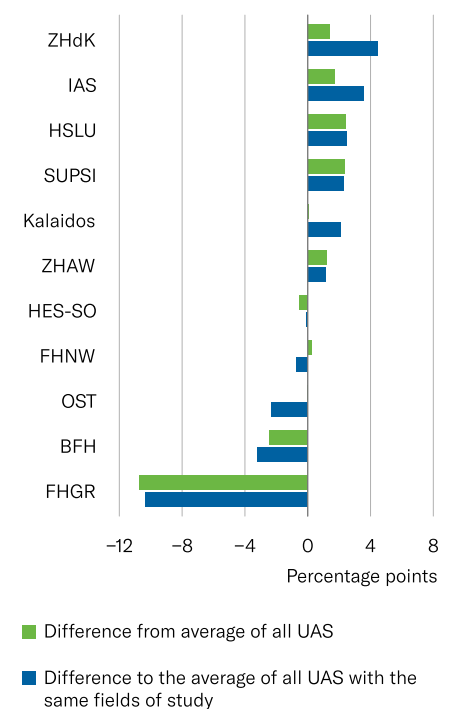
Graduates’ evaluation of the degree programme can give an indication of the quality of the education, but it also depends on the expectations with which the students chose their subject or higher education institution. When asked whether they would choose the same subject at the same higher education institution again, a good 70% of those surveyed answered yes in 2023. However, approval varies widely depending on the field of study: It ranges from 64% (applied linguistics and design) to 82% (applied psychology). Regardless of the field of study, there are also differences between the universities of applied sciences (→ Figure 270). At the FHGR, the share of students who would opt for the same course of study again is by far the lowest. However, the BFH also has below-average shares. If only the differences within a field of study are taken into consideration, the highest values are found at the ZHdK. For the same fields of study, the difference between the higher education institution with the highest and lowest approval rates is 15 percentage points. Assuming that the survey results reflect the quality of education, there are such large differences between the universities of applied sciences that they can significantly influence the quality of teaching – for example through the design of study structures, curricula, the recruitment of lecturers or university didactic measures.

The **qualifications framework** for the Swiss higher education sector summarises the skills to be achieved by the students at the end of each cycle in the following five categories: “knowledge and understanding”, “application of knowledge and understanding”, “judgement”, “communication skills” and “self-directed learning”.

270 Evaluation of course of study by university of applied sciences, 2023

Share of graduates who would choose the same subject again at the same higher education institution: Difference from average of all UAS (71%)

Data: FSO (EHA); calculations: SCCRE



Successful completion of studies

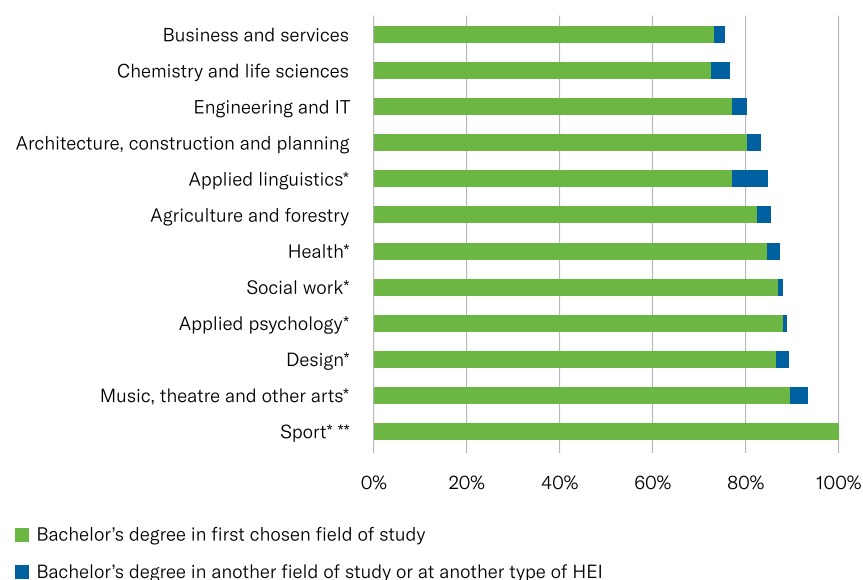
Assuming that the successful completion of studies reflects the acquisition of the target skills (and thus of the quality of the education), the graduation rate can provide an indication of the effectiveness of the education at universities of applied sciences. However, the rate also depends on the selection strategy and/or the quality standards that a higher education institution applies. For example, a low graduation rate can also point to high quality standards in a degree programme and, conversely, a high graduation rate may be an indicator of low standards. The graduation rate can only serve as a reliable indicator of the effectiveness of education if the qualification requirements of higher education institutions are not lower than those expected by the labour market.

In addition, the graduation rate is determined not only by the requirements of higher education institutions and the quality of education, but also by the composition of the student body. However, the universities of applied sciences can apply these through selection both at the time of admission and during the course of study. This is because, unlike universities, which are not allowed to select their Bachelor's students except in the fields of medicine and sport sciences, universities of applied sciences are free to vet prospective students through corresponding entry procedures – and make use of this option in various fields of study.

271 Degree success up to 8 years after commencement of the Bachelor's degree program by field of study

For the 2013 admission of students who were living in Switzerland prior to starting the course

Data: FSO



* Field of study with aptitude test

** Values based on student numbers of <50

On average, four out of five students earn a Bachelor's degree within eight years of starting their studies, with the graduation rate varying between 76 and 100% depending on the field of study (→ Figure 271). As expected, graduation rates are higher in fields of study with an aptitude test than in fields where this type of assessment is not carried out.

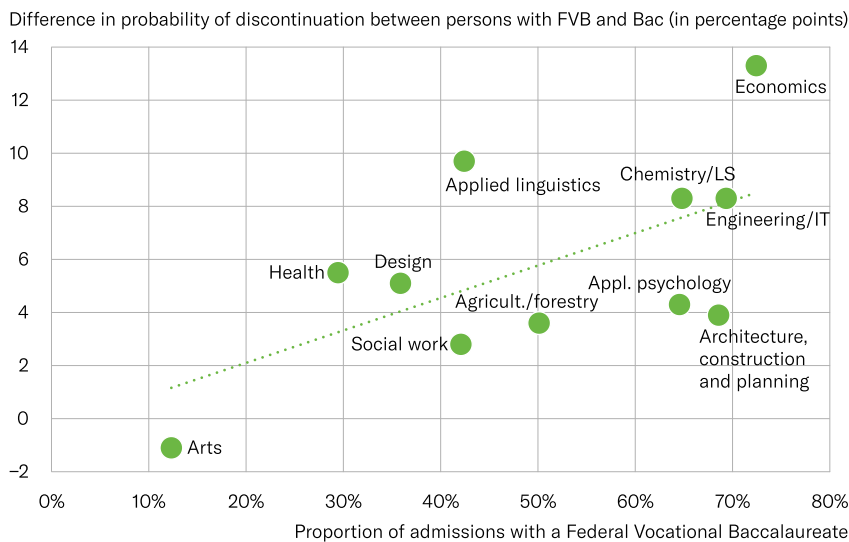
Of those who have not graduated, 15% have dropped out of their studies, 2% are still studying and 2% have left Switzerland. Persons with an academic baccalaureate (Bac) generally have a lower probability of dropping out of their studies – leaving the higher education system without a completed qualification – than persons with a federal vocational baccalaureate (FVB) (→ Figure 272). Here, too, the difference varies by field of study. It is highest in the field of study of business and services, while students with an academic baccalaureate do not perform better in the field of study of music, theatre and other arts. Generally speaking, the differences in the drop-out probability are greater in those fields of study in which the share of students with a federal vocational baccalaureate is higher.

Persons with a specialised baccalaureate have an even higher probability of dropping out than persons with a federal vocational baccalaureate. This applies in particular in the area of health.

272 Difference in the drop-out probability between persons with a federal vocational baccalaureate and an academic baccalaureate

And share of admissions with a federal vocational baccalaureate; Bachelor's degree admissions 2016–2018 with place of residence before start of studies in Switzerland

Data: FSO (LABB, SHIS-studex); calculations: SCCRE



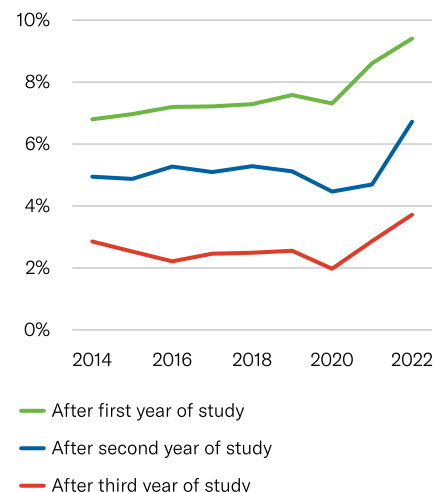
The **probability of dropping out** measures the probability of leaving the higher education system without a qualification if other characteristics are the same (gender, age, nationality, part-time studies and university of applied sciences).

The drop-out rate in 2022, i.e. after the COVID-19 period, increased significantly in all academic years; this is reflected in the development of the share of students who dropped out after the first, second or third year of study (→ Figure 273). Although there are indications that a good economy increases the probability of dropping out of studies (particularly drop-outs after the second or third year of study), analyses of the LABB data suggest that the higher drop-out rate in 2022 cannot be explained, or only partially explained, by the economy. Late consequences of the COVID-19 pandemic can also be

273 Share of drop-outs by academic year completed, 2014–2022

Persons in their undergraduate studies who were resident in Switzerland prior to starting the course

Data: FSO (LABB); calculations: SCCRE



The year refers to the end of the respective academic year (e.g. 2018 = end of the 2017/18 academic year). In order to rule out the possibility that an interim year entered in the 2022/23 academic year is incorrectly defined as a drop-out, only the drop-outs up to 2022 are shown.

largely ruled out as an explanation for the increase in drop-outs. When the COVID-19 pandemic broke out in 2020, the number of drop-outs fell slightly, particularly amongst second and third-year students, which could potentially lead to higher drop-out rates later during the course of studies. However, this would not explain the higher drop-out rates of students in the first year of study. As the causes are unclear, we must wait and see whether the increase in drop-out rates is a continuing trend or not.

Around one third of those who have dropped out of their Bachelor's degree programme will start another training course in the area of professional education within ten years. This share is particularly high amongst former students in the field of business and services (40%).

Labour market success

Successful labour market integration is a key criterion for evaluating the education delivered at universities of applied sciences, as these institutions are mandated to provide education that is relevant to the world of work. Successful and rapid labour market entry therefore provides an indication of whether the course of study has provided students with skills that are relevant to the labour market. However, the graduates' employability depends not only on their higher education but also on the skills they brought with them at the time of enrolment, on selection by the university of applied sciences during the course of studies, on work experience, and on the regional labour market situation at the time of graduation.

Overall, graduates of universities of applied sciences integrate relatively well into the labour market. The 2023 graduate survey shows that, according to the definition of the International Labour Organisation (ILO) (→ *chapter Universities, page 211*), 92% are gainfully employed and 4% are unemployed on average one year after graduation. Five years after graduation, the proportion of unemployed individuals according to the ILO is still at 4% and the unemployment rate at 1% (for the 2018 graduation cohort), which is considerably lower than the average for the Swiss working population. Four out of five persons (81%) who are in employment one year after graduating from a university of applied sciences are in an occupation that requires a university degree or corresponds to the professional qualifications acquired during the course of study. The reason why this figure is not higher may be due to the fact that certain positions are equally suitable for graduates of professional education (particularly from the professional education institutions) or holders of CET certificates (e.g. MAS).

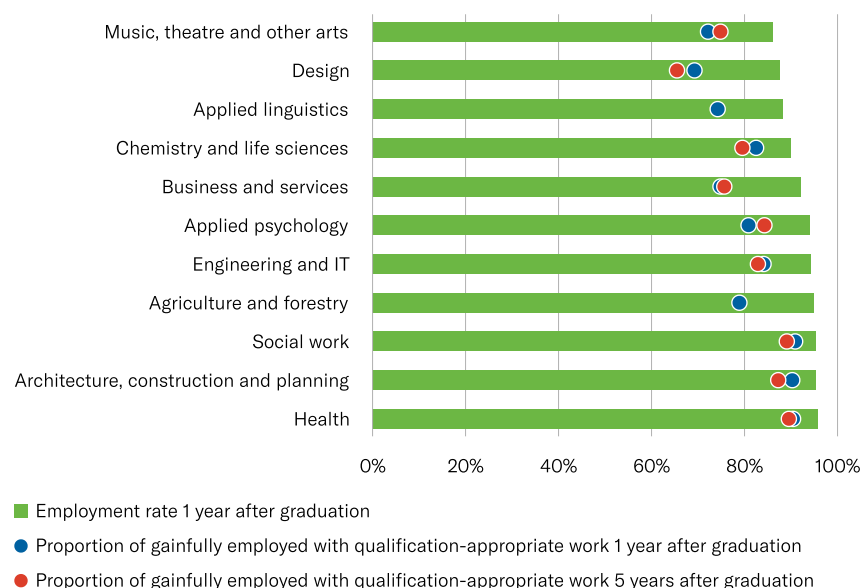
However, there are clear differences between the individual fields of study in terms of both labour force participation as well as in the quality of employment (→ Figure 274). The highest employment rates and shares of persons in qualification-appropriate work can be found in the areas of health, architecture, construction and planning, and social work. The employment rate is lowest in the areas of music, theatre and other arts, as well as in design, although in these areas the current admission restrictions attempt to alleviate some of the expected difficulties in labour market integration through strict selection. Surprisingly, however, the share of persons in training-appropriate employment is also significantly below average in areas where high demand could be expected due to the shortage of skilled workers. This applies in particular to the business and services

sector. The share of persons in employment who completed their studies in 2018 and are employed in a training-appropriate manner increased by an average of 1 to 2 percentage points (from 79 to 80%)⁶ in the time between the first and fifth years after completing their studies. As a result, the share of persons employed in a non-qualification-appropriate occupation remains substantially high even five years after graduation, indicating that this cannot be just an entry-level phenomenon. In general, as expected, it appears that graduates with lower final grades are much more likely to be employed in an occupation not in line with education than those with better grades, which indicates that non-qualification-appropriate occupation is often not a free choice.

274 Labour market situation 1 year and 5 years after completion of studies, 2023

Graduates at Bachelor's level, provided they have not begun a Master's course, and at Master's level; data points with case numbers < 50 are not shown

Data: FSO (EHA); calculations: SCCRE



Employment in **jobs appropriate to education** refers to persons whose professional position a) requires a university degree or b) displays a clear match with professional skills acquired during higher education (level 4 and 5 on a scale from 1 "not at all appropriate" to 5 "highly appropriate").

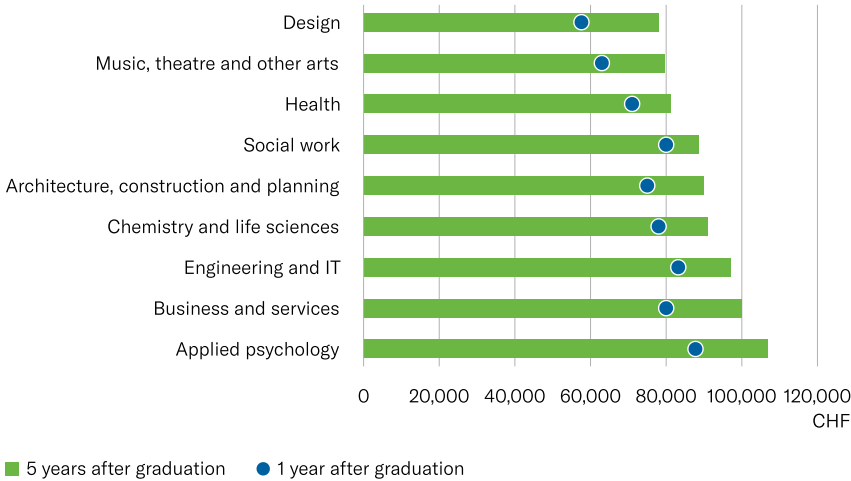
Income also varies widely between the fields of study (→ Figure 275). Gross income from employment, projected to a full-time position five years after completion of studies, is on average between CHF 80,000 and 110,000 (median values). The lowest incomes are in the areas of design, music, theatre and other arts, which are also characterised by low employment rates. Wages are also similarly low in the healthcare sector, where there is a major shortage of skilled workers. Strong wage growth can be observed in the first five years after graduation. On average, the salary increases by CHF 17,000 over a period of four years.

⁶ The increase in education adequacy is not correctly reflected in Figure 274, as different cohorts are mapped. The figures for one year after graduation are based on the 2022 graduation cohort, whereas those for five years after the completion of studies relate to the 2018 cohort.

275 Standardised gross income from employment 5 years after graduation by field of study

Median income of 2018 Bachelor's level graduates, provided they have not started a Master's degree, and median income at Master's level; only fields of study with a sample size of at least 50 persons

Data: FSO (EHA); calculations: SCCRE



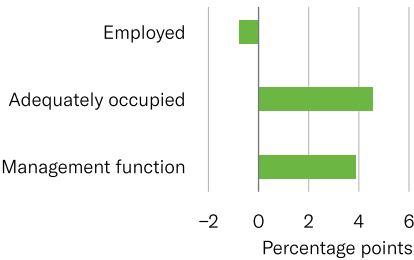
Non-cognitive skills

The **grit** measures the ability to pursue long-term goals persistently and not be discouraged by setbacks (Duckworth et al., 2007; Schmidt et al., 2019). It is measured on a scale of 1 to 5.

276 Connection between grit level and labour market opportunities 1 year after graduation, 2023

Change in the probability of being employed and, if employed, of being employed in jobs appropriate to training or of assuming a management position if the grit increases by 1 unit

Data: FSO (EHA); calculations: SCCRE



Non-cognitive skills such as perseverance, motivation, conscientiousness, competitive orientation, openness, curiosity or willingness to cooperate can have an impact on educational success (Molnár & Kocsis, 2024; Shan & Zöhlitz, 2025; Sorrenti et al., 2025). In addition, these skills can also influence future labour market opportunities. Results of a meta-analysis (Cabus et al., 2021) suggest, for example, that conscientiousness and openness lead to higher earnings, while tolerance (consideration, willingness to cooperate, empathy) and neuroticism (low emotional stability) are associated with lower earnings.

Although personality traits have by definition a certain level of stability, they can be changed. Research results show that student resilience can be increased through interventions (Rodríguez-Planas et al., 2023) and that peers have an influence on personality traits (Shan & Zöhlitz, 2025). One explanation for individual success is attributed to the personality trait grit, which refers to the ability to overcome challenges and setbacks and to stick to goals even when faced with obstacles (→ margin text). Evaluations of the graduate survey show that Master's graduates have a higher grit level than those with a Bachelor's degree. In addition, persons who completed an apprenticeship or were in regular employment before studying at a university of applied sciences have a comparatively higher grit level. This observation is consistent with the finding that young people with a higher grit level choose vocational education and training comparatively more frequently than a general education school (Albiez et al., 2025). Differences are also shown by university of applied sciences and field of study. There is no statistically significant correlation between the grit level and the probability of being employed one year after graduation (→ Figure 276). However, it is clear that gainfully employed graduates with a higher grit level are more likely to take up a profession that is appropriate to their education and more likely

to hold a management position than those with a lower grit level. In these contexts, however, it is unclear whether the grit level actually has a causal influence on labour market opportunities or whether, conversely, the type of activity influences grit.

Efficiency/costs

Assessing the efficiency of the universities of applied sciences – that is, the relationship between the use of resources (input) and the achievement of objectives (output) – relies on comparable data relating to the costs (inputs) and a suitable measure for output (that is, effectiveness) being available. While comparable data is available for the individual universities of applied sciences on the cost side, it is difficult to comprehensively measure effectiveness and thus efficiency (as described in the chapter Effectiveness). The focus is therefore primarily on the costs of the universities of applied sciences and their income.

Funding of universities of applied sciences

A good 60% of basic education at public universities of applied sciences is funded by the cantons and just under 30% by the federal government, while private income accounts for 10% (→ Figure 277). A good two-thirds of the cantonal contributions stem from the supporting cantons themselves and a quarter to a third from cantons outside the supporting region. The latter pay the contributions for their students from outside the canton to the respective canton of the university of applied sciences as part of the Intercantonal Agreement on Universities of Applied Sciences (FHV)⁷.

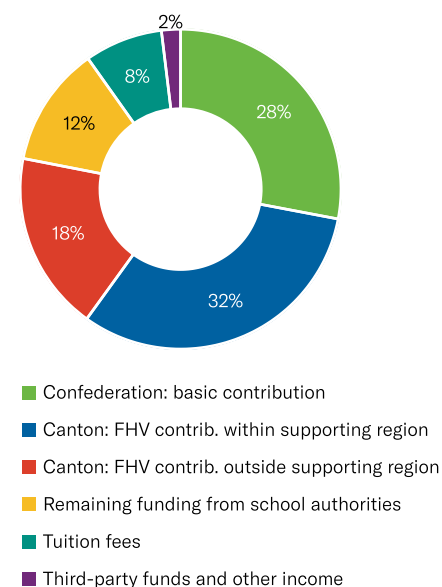
Since the introduction of the Federal Act on the Funding and Coordination of the Higher Education Sector, the basic federal contributions are no longer paid as fixed lump sums per student. Rather, the amount of the contribution payments also depends on the performance of the individual fields of study compared to other universities of applied sciences (→ *chapter Tertiary-level education, page 189*). The basic federal contributions have risen continuously in nominal terms since 2010, but have stagnated in real terms since 2021 (→ Figure 278). Due to the growth of the student population, contributions per student have also been declining since 2016. As the student population is expected to grow further in the coming years, the amount available per student will fall even further. Between 2016 and 2028, the decline is expected to be 15% (taking into account the inflation forecast). In view of the increasingly scarce funds, efficiency issues will therefore come even more strongly to the fore. These include questions such as whether the universities of applied sciences are too fragmented or to what extent cooperation could save costs.

Tuition fees cover 8% of the costs of education and amount to between CHF 1,550 and CHF 2,150 per year, depending on the university of applied sciences. For international students, the fees are somewhat higher at most higher education institutions. In general, the fees are standard for all fields

277 Composition of funding sources, 2023

In the area of basic education and training

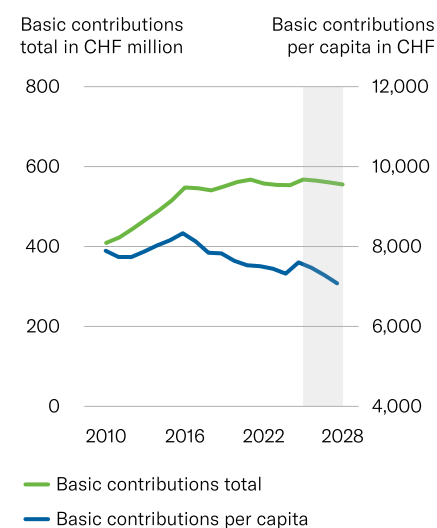
Data: FSO; calculations: SCCRE



278 Development in basic contributions, 2010–2028

Basic contributions 2010–2024 and (grey background) the planned values for 2025–2028 (as of July 2025), deflated

Data: FSO (SHIS-studex), SERI, SECO; calculations: SCCRE



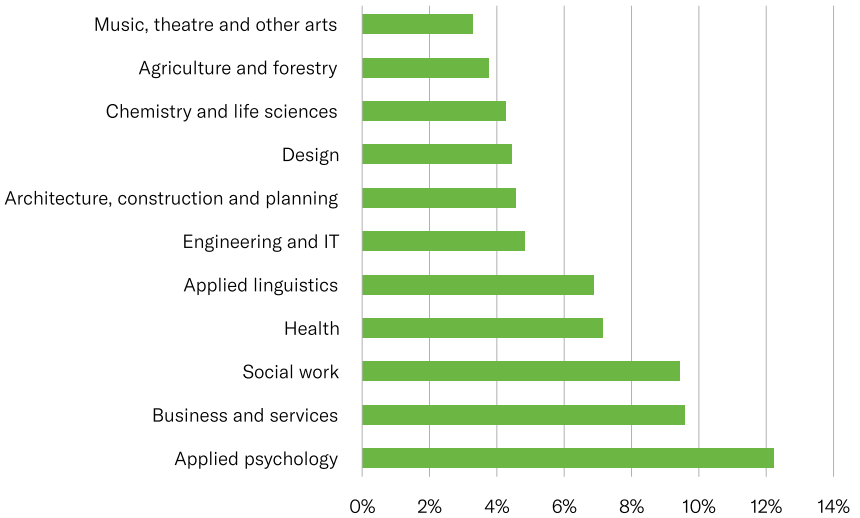
⁷ Intercantonal Agreement on Universities of Applied Sciences of 12 June 2003.

of study within the individual higher education institutions. The SUPSI and – in the case of international students – the FHNW are exceptions. As the education costs vary widely depending on the field of study (→ *Costs by field of study*, page 262), the share of these costs borne by the students is also very different (→ Figure 279). With tuition fees of CHF 1,700 per year, their share of the education costs (basic education) varies between 3% (music, theatre and other arts) and 12% (applied psychology), depending on the field of study.

279 Share of costs covered by tuition fees by field of study

For tuition fees of CHF 1,700 per year; the costs refer to the full costs of teaching in basic education in 2023

Data: FSO; calculations: SCCRE



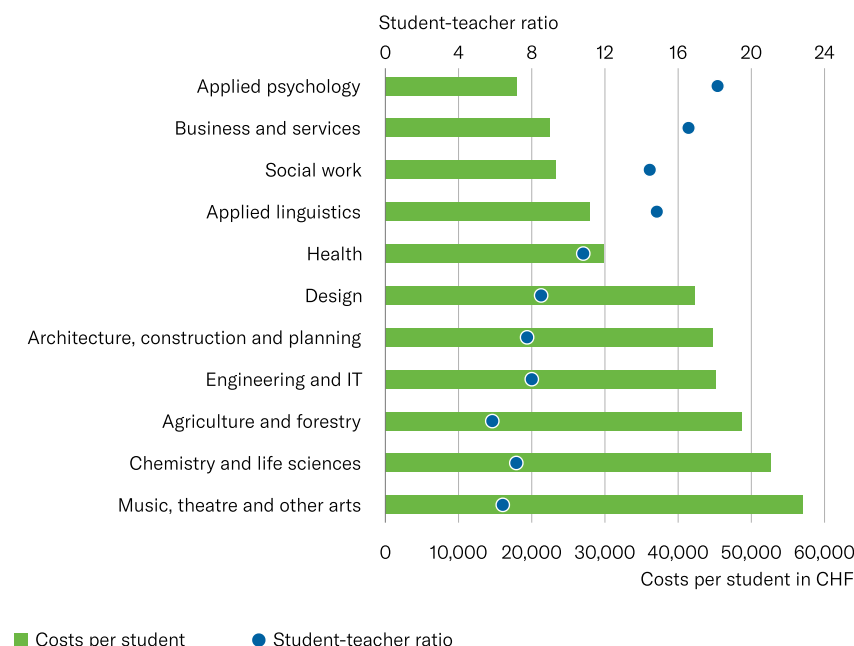
Costs by field of study

If the costs for applied research and development are considered in addition to teaching **costs**, the annual expenditure per student ranges from CHF 25,000 (applied psychology) to CHF 100,000 (chemistry and life sciences).

The annual teaching costs per student vary widely depending on the field of study. Expenses range from just under CHF 18,000 (applied psychology) to over CHF 50,000 (chemistry and life sciences as well as music, theatre and other arts) (→ Figure 280). Projected over a three-year Bachelor’s degree program, the public sector contributes between CHF 50,000 and CHF 170,000, and for a five-year degree program leading to a master’s degree between CHF 80,000 and CHF 280,000. These differences can largely be explained by the different student-teacher ratios. Certain subjects, such as the laboratory-intensive life sciences, require a higher intensity of teaching, and subjects such as music or theatre even call for individual tuition in some situations. In other subjects, small classes or intensive levels of supervision are primarily cost drivers and must be critically examined from an efficiency point of view if they do not contribute to an increase in effectiveness.

280 Student-teacher ratio and costs per student by field of study, 2023

Data: FSO; calculations: SCCRE



Costs per student

Annual full costs for teaching (basic education and training) per student FTE

Student-teacher ratio

Number of student FTEs per FTE in the academic teaching staff (basic education and training)

The basic education comprises Bachelor's and Master's degree programmes. The calculation of student FTEs is based on the number of ECTS points for which students have registered, where 60 ECTS points per year correspond to a full-time course of study.

Research results indicate that larger classes also tend to be associated with lower grades at higher education institutions (*Kara et al., 2021*), although differences exist between the subjects and the social origin of the students. However, the intensity of teaching at universities of applied sciences is relatively high compared to universities. This also means that the public education costs for a Bachelor's degree at a university of applied sciences are higher than those for a complete master's degree at universities (→ *chapter Universities, page 211*).

Equity

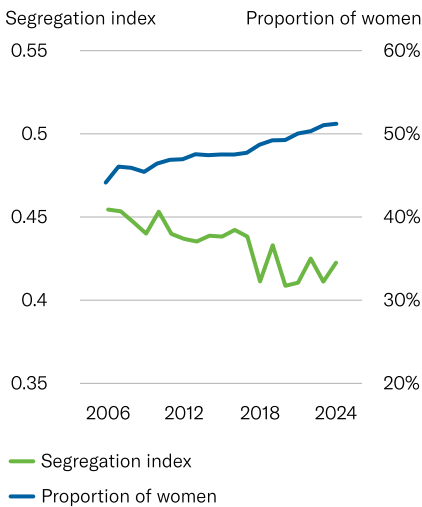
Using access and participation as criteria, this section rates equal opportunities at the universities of applied sciences. It looks at disparities between women and men as well as differences in social origin and migration background.

Gender differences

Based on the total number of students, the gender distribution at universities of applied sciences is very well-balanced, with women accounting for 51% of students (academic year 2024/25). However, there are significant differences between the genders depending on the field of study. Men are heavily overrepresented, particularly in the fields of technology and IT, as well as in architecture, construction and planning, while women are equally overrepresented in the fields of health, applied linguistics, applied

281 Share of women and gender segregation at study intake, 2006–2024

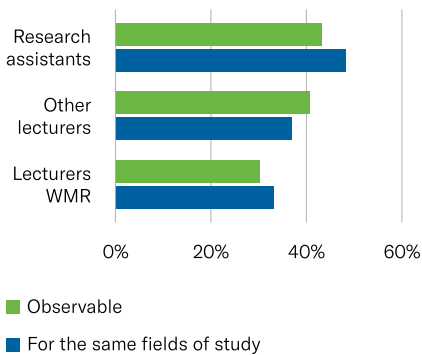
Data: FSO; calculations: SCCRE



The **segregation index** (Duncan dissimilarity index) measures how many persons would have to change their field of study in order to achieve a balanced gender distribution. The value range of this measure is between 0 (even distribution) and 1 (total segregation).

282 Share of female employees by professional status, 2023

Data: FSO (SHIS-PERS); calculations: SCCRE



WMR With management responsibility

psychology and social work. Looking at the development of student admissions over the last 15 to 20 years, it is clear that not only has a balanced gender ratio been achieved overall, but that gender segregation has also decreased, in other words, the unequal distribution of genders across subjects (→ Figure 281).

The gender ratio at Master’s level is just as balanced as at Bachelor’s level. However, the transition rates from Bachelor’s to Master’s level are lower for women than for men in many fields of study, specifically in the fields of technology and IT, chemistry and life sciences, health and the arts. The fact that the share of women at Master’s level is not lower than that of men is primarily due to the fact that women are overrepresented in fields of study with above-average Master’s transition rates (applied psychology as well as music, theatre and other arts). In addition, women show a higher transition rate than men in the field of design.

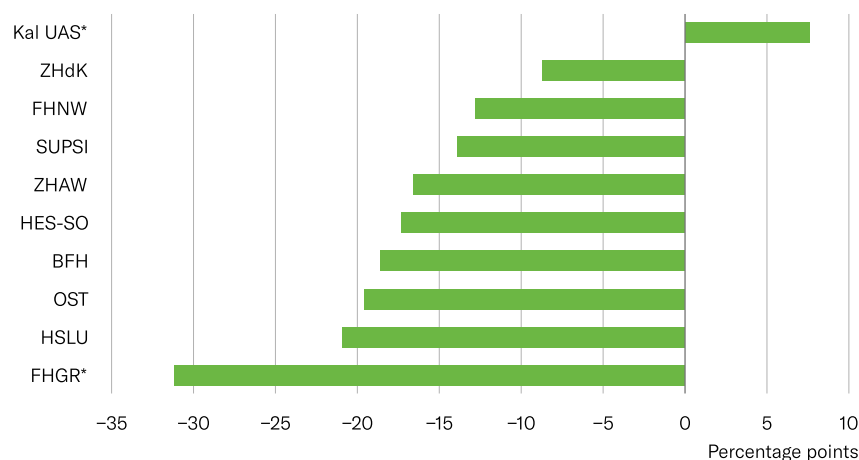
With regard to academic staff, the share of women decreases with increasing career levels. While this is 43% for assistants and research associates, it is 41% for “other lecturers” (without management responsibilities) and 31% for lecturers with management responsibilities (→ Figure 282). Within a field of study, the decline in the share of women between the first and second career levels is almost always considerably greater than between the second and third levels. Overall, the share of women drops by around 10 to 25 percentage points up to the highest hierarchical level, depending on the field of study.

Considering the difference in the share of women between lecturers with managerial responsibilities and students, it can be seen that this varies widely between the universities of applied sciences, regardless of the composition of the fields of study (→ Figure 283). At the FHGR, the difference is by far the greatest. At the other public universities of applied sciences, the difference is between 10 and 20 percentage points. The Kalaidos is a special case. Here, the share of women amongst lecturers with managerial responsibilities is higher than amongst students. Overall, the results indicate that universities of applied sciences can definitely influence the participation of the underrepresented gender through their human resources policies and that underrepresentation cannot be explained solely by a shortage of well-trained female academics.

283 Difference in the share of women between lecturers with managerial responsibilities and students by UAS, 2023

For the same fields of study

Data: FSO (SHIS-studex, SHIS-PERS); calculations: SCCRE



The proportion of women amongst lecturers with management responsibilities is based on FTEs and amongst students it is based on heads. The difference between the proportion of women amongst students and amongst lecturers with managerial responsibilities is based on an average weighted by the number of students per field of study and UAS.

* The number of lecturers with management responsibility is less than 50.

Social background

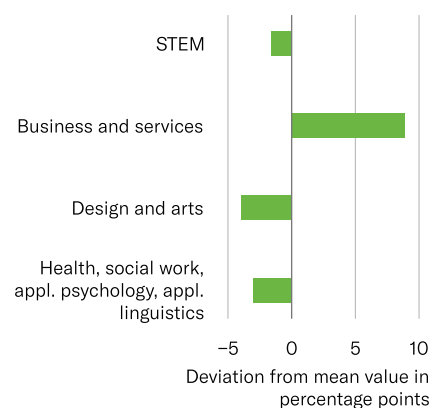
Persons whose parents have a higher socioeconomic status have a significantly higher degree of probability of starting and successfully completing a degree at a university of applied sciences than persons whose parents have a lower socioeconomic status (→ *chapter Tertiary-level education, page 189*) (Buchmann et al., 2016; Combet & Oesch, 2021). The different educational opportunities can largely be explained by the level of requirements at lower-secondary level and the performance differences at the end of compulsory education.

There are also differences in the choice of field of study by social origin. Students whose parents have a tertiary educational qualification are comparatively more likely to choose a course of study in the fields of STEM as well as design and arts; students with parents without a post-compulsory education are much more likely to choose a course of study in the field of business and services (→ Figure 284). Most of the observed differences are independent of the observed differences in performance at the end of compulsory education. Persons whose parents do not have a post-compulsory qualification are comparatively more likely to study in the field of business and services and less likely to study in the field of design and art, even with the same performance (→ Figure 285). In view of the comparatively good labour market opportunities in the former field and the comparatively poor labour market opportunities in the field of design and the arts (→ Figure 274 and 275), the socially selective choice of subjects is unlikely to have a negative impact on the labour market opportunities of less privileged students.

285 Differences in subject selection with the same grades

Deviation of persons whose parents do not have a post-compulsory qualification from the average probability of starting a course of study in the corresponding field of study; persons who took part in the 2016 review of the national education objectives (ÜGK) and started a course of study at a university of applied sciences

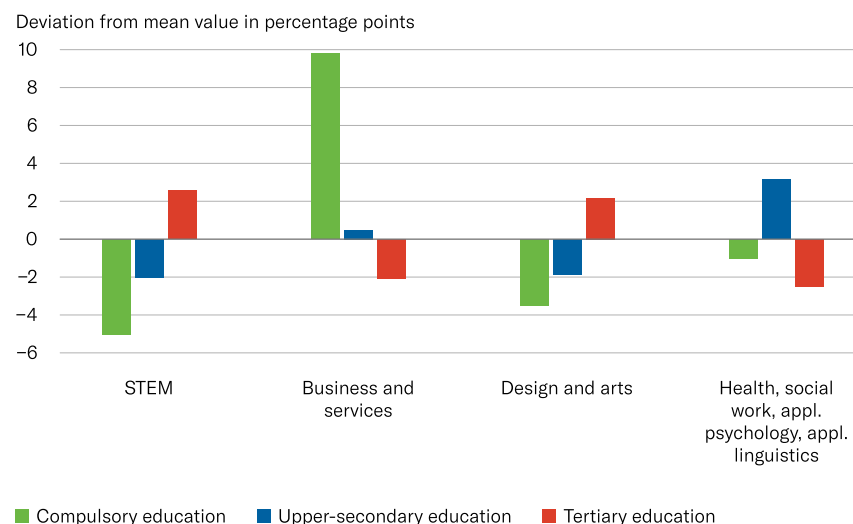
Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE



284 Differences in subject choice by parents' highest educational qualification

Deviation from the average probability of starting a course of study in the fields of STEM (27%), business and services (35%), design and arts (8%) or health, social work, applied psychology or linguistics (29%); persons who have taken part in the 2016 ÜGK survey and started a course of study at a university of applied sciences

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE

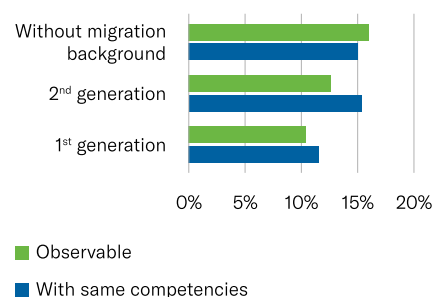


Reading example

Persons whose parents do not have a post-compulsory qualification choose a STEM course of study with a probability of 5 percentage points less than average (27%). The share that opts for a STEM course is 22% ($27\% - 5\% = 22\%$).

286 Entry rates by migration background

Data: FSO (LABB), EDK (ÜGK 2016); calculations: SCCRE



Migration background

Persons with a migration background are underrepresented at universities of applied sciences, with first-generation migrants tending to study even less frequently than those of the second generation (→ Figure 286). The lower probability of starting a course of study at a university of applied sciences can be partly explained by the (lower) performance at the end of compulsory education. With the same (ÜGK) performance, second-generation migrants take up studies as often as persons without a migration background. On the other hand, amongst recent immigrants, the lower probability of admission to a university of applied sciences can be explained by the strong preference for universities: With the same skills, they decide to study at a university more frequently than persons without a migration background (→ *chapter Universities, page 211*). This finding is consistent with the explanation that persons with a migration background have, on average, higher educational aspirations or show a higher preference for schools with general education programmes (Abrassart et al., 2020).

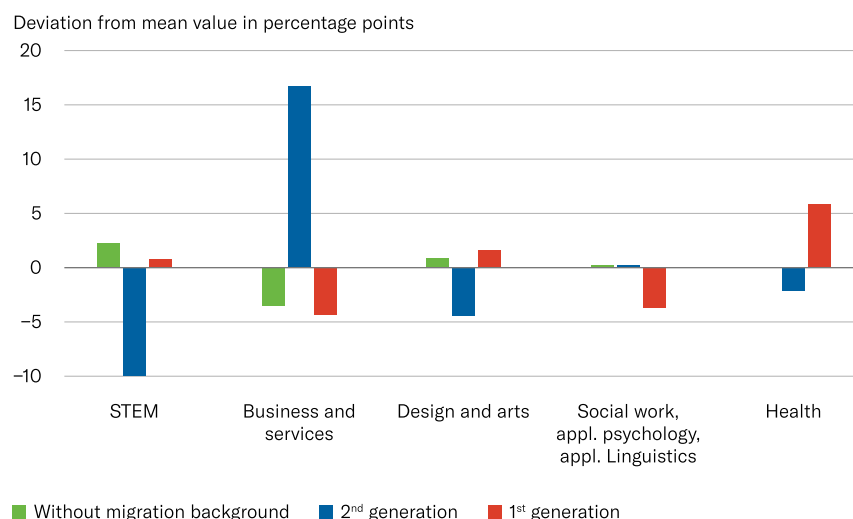
Differences by migration background are also evident in the choice of studies (→ Figure 287). Compared to persons without a migration background, children of immigrant parents are less likely to choose to study in the STEM field or in the fields of design and the arts and more likely to study in the field of business and services. Conversely, new immigrants tend to choose the field of study of health more frequently and the fields

of social work, applied psychology and applied linguistics less often. The differences are independent of the mathematics performance at the end of compulsory schooling.

287 Differences in choice of studies by migration background

Deviation from the average probability of starting a course of study in the fields of STEM (27%), business and services (35%), design and arts (8%), social work, applied psychology or linguistics (13%) or health (17%); persons who have taken part in the 2016 ÜGK survey and started a course of study at a university of applied sciences

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE



Reading example

Second-generation migrants opt for a STEM course 10 percentage points less frequently than the average (27%). The share that opts for a STEM course is 17% ($27\% - 10\% = 17\%$).

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

**CONTINUING EDUCATION
AND TRAINING**

UNIVERSITIES OF TEACHER EDUCATION

Context

Importance and function of universities of teacher education

Teacher training at universities and universities of applied sciences

Teaching staff are not trained only at UTEs: In the canton of Geneva, teachers of all levels are trained at the Institut universitaire de formation des enseignants (IUFE) of the University of Geneva; in the canton of Fribourg, teachers of all levels have been trained at the Department of Teacher Education at the University of Fribourg since autumn 2025. The universities of Zurich, Geneva, Fribourg, St. Gallen and ETH Zurich offer training for baccalaureate school teachers. Finally, universities of applied sciences have degree programmes for specialist subject teachers in specialised areas such as music, art and sport. All in all, however, all these institutions account for less than 10% of all students in the field of teacher training (→ *Institutions*, page 278).

Today, universities of teacher education (UTE) are considered the third category of higher education institutions, even if the legal higher education framework only provides for two categories (Art. 2 para. 2 HEdA¹). Institutionally, the universities of teacher education as well as the universities of applied sciences (UAS) are structured as practice-oriented higher education institutions; some are integrated into universities of applied sciences. Their central social function is the training and continuing education of teaching staff and other professionals in professions in the education sector. Due to their enormous significance for the entire education sector, the universities of teacher education will be dealt with separately in the Education Report. This is also appropriate because the universities of teacher education differ from the universities of applied sciences in their governance and because they are presented separately in the statistics and reporting. However, the institutional perspective of the Education Report – education is described according to education levels and types – means that teaching training is only dealt with in this chapter if it takes place at higher education institutions that are accredited as universities of teacher education in accordance with the Higher Education Act (HEdA). Teachers are also trained at universities of applied sciences and universities (UNIs) (→ *margin text*).

For the cantons, the major significance of the universities of teacher education lies in the supply function they perform for the school system. As school authorities, they rely on the universities of teacher education to tailor the training of their pedagogical staff qualitatively to the requirements of the cantonal education system, for example in terms of school type, subject range and teaching aids. They are also expected to ensure the quantitative demand for teaching staff. However, this task is also dependent on a series of contextual factors largely beyond the control of universities of teacher education. Demographic development, social trends, the appeal of the teaching profession, other training options or considerations regarding opportunity costs influence the choice of studies of potential students at universities of teacher education. Self-selection in the universities of teacher education is also influenced by politically determined admission requirements, the duration of studies and other framework conditions of training (*Neugebauer, 2013; Renger et al., 2024; Rothland et al., 2018*).

From the perspective of education policy, the focus is on securing the demand for teaching staff for the education system. Both the demand side as well as the supply side have to be taken into account. Demand for teachers is primarily determined by demographics. The offer to teaching staff is about attracting enough capable candidates to study at a university of teacher education, preparing them for the teaching profession and keeping them successful in the profession (*Denzler, 2023; Denzler & Wolter, 2018*).

¹ Federal Act on the Funding and Coordination of the Higher Education Sector (HEdA) of 30 September 2011.

Determining the supply of teachers in terms of the labour market

The supply of teachers on the labour market is primarily determined by the number of trained and available teachers. Here, it is important to consider the entire process, from choosing a course of study to starting a career. Since 2010, admissions to the universities of teacher education have increased by over 30%. In the meantime, at least 4,000 students – which corresponds to around 11% of all baccalaureate students – decide on a degree programme at a university of teacher education. 83% of an entrance cohort complete their studies successfully and obtain a teaching diploma at compulsory education level. Almost 90% of graduates enter the profession and are employed as teachers one year after graduation; five years later, this figure is still around 80%. Even if only two-thirds of students who started a course of study at a university of teacher education are active as teachers five years after their training, the career entry and retention rates are relatively high compared to the other types of higher education institutions and training subjects (→ *Effectiveness*, page 287).

The cantons are active in a threefold capacity with regard to the UTEs: First as a school authority of the university of teacher education, second as a future employer of the graduates and third with regard to the training contents as the authority responsible for defining both the curricula and the timetabling guidelines for the future place of work of the students. This would in turn suggest that the universities of teacher education must be much more strongly aligned towards the needs and expectations of the cantons than the other institutions of higher education.

Mobility and fluctuation of teaching staff

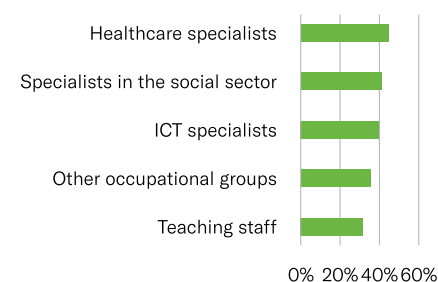
The professional mobility of teachers is relevant not only from a systemic perspective in light of the current shortage of teachers, but better research into fluctuation on the labour market could provide important information both in terms of teacher training and school management. Herzog et al. (2022) cite a number of research strategies, such as an in-depth examination of the link between occupational mobility and the quality of school and teaching, more comparisons across different occupational fields and more longitudinal surveys.

Based on the School Staff Statistics (SSP), a high retention rate in the teaching profession can be shown for Switzerland. After one year, teachers in compulsory education under the age of 55 have a retention rate of 92%; after five years, it is still 83% (FSO, 2022d). This rate includes both job changes within and between cantons. Only just 6% have taken on a new job outside of the school system. In addition, many exits are only of a temporary nature; around half of the teaching staff who leave the profession return to it again within five years. A comparison between the fluctuation of teaching staff and other professional groups shows that teachers have a longer tenure than, for example, specialists in the social and health sectors (→ Figure 288).

288 Turnover of teachers in comparison to other professional groups

Proportion of employed persons with tenure of less than three years; 2018–2022

Data: FSO (SLFS); calculations: SCCRE



Intercantonal mobility

In view of the shortage of teachers in certain cantons, the question arises as to what extent supply and demand on the labour market transcend cantonal borders. Theoretically, cantons with strong pupil growth would have to attract more teaching staff from other cantons. However, the picture obtained from the School Staff Statistics is not clear. Among the cantons with a growing number of pupils, there are winners and losers. Cantons such as Aargau and Schaffhausen have a negative balance. They lost teachers in spite of pupil growth; Zug or Grisons, on the other hand, gained teachers (→ Figure 289). However, the share of teachers who change canton is in the low single-digit percentage range. Analyses also show that the different cantonal wage levels do not explain the patterns.

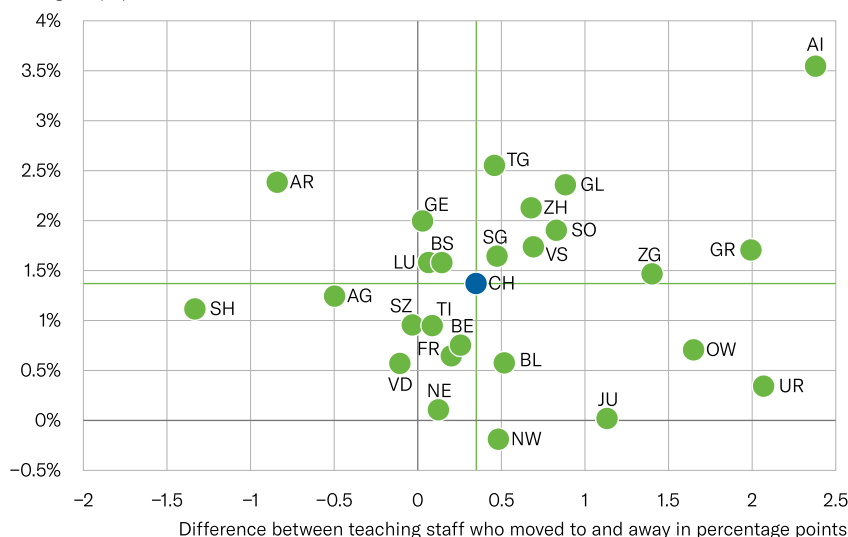
289 Mobility of teachers between cantons and change in pupil numbers

Data: FSO (SSP); calculations: SCCRE

The net migration of teachers is calculated for each canton based on the difference between teachers who have moved to and who have moved away and is shown on the x axis: While the canton of Zug gained almost one and a half percent of the teaching staff on balance, the canton of Aargau lost around half a percent.

For two consecutive years, the sample includes persons working exclusively at primary school level (Harmos 3–8) and exclusively as teachers who were employed in a mainstream public school and only in one canton (including fixed-term appointments); for the analyses of the status in the following year, 2020 and 2022 were considered, and for the analyses of the status in the previous year, 2019 and 2021.

Change in pupil numbers



Level of employment

The supply of teachers is decisively determined by the level of employment of active teaching staff. The teaching profession is characterised by a high proportion of women, which, amongst other things, explains the high prevalence of part-time employment. Studies show that the teaching profession is chosen, amongst other things, precisely because the opportunities for part-time work are good and therefore it is easy to achieve a good work-life balance (*Kappler et al., 2022; Leemann et al., 2022; Stellmacher & Pfetsch, 2020*).

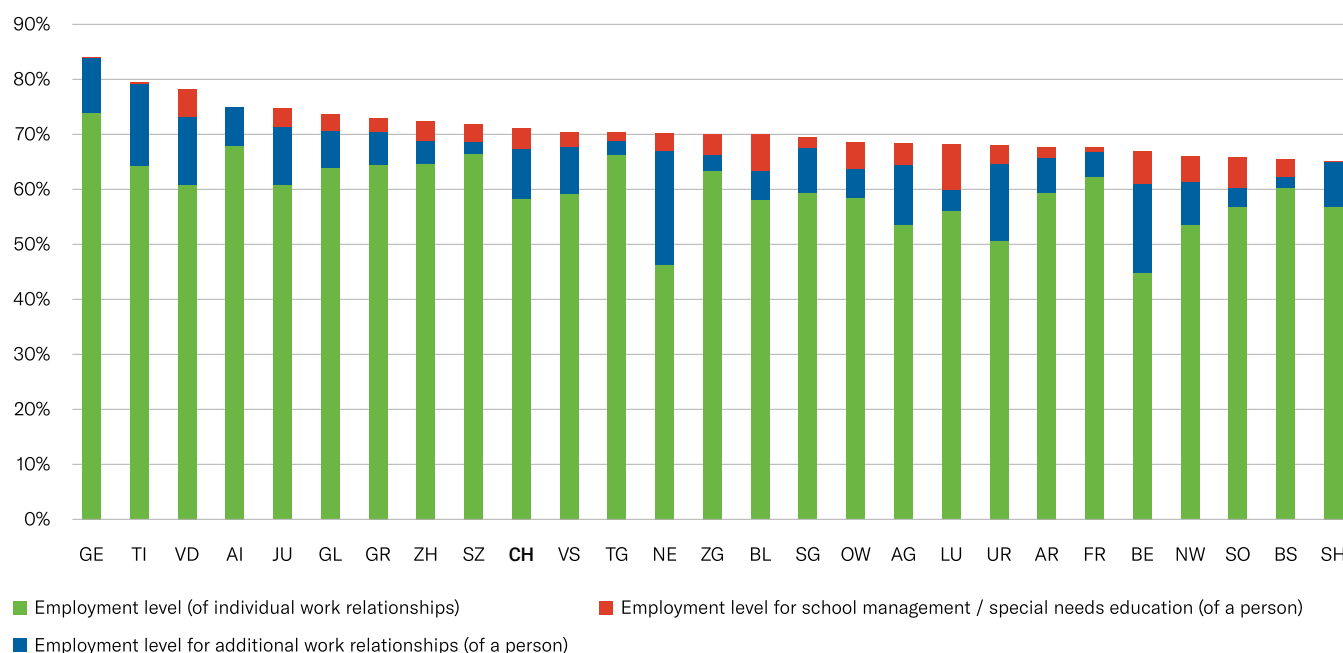
Despite the increasingly tense situation on the labour market due to the shortage of teachers, the average level of employment has not changed significantly in recent years. On average, an employment relationship corresponds to a workload of just under 60%, although considerable variation exists between the cantons (→ Figure 290, green bars). If all workloads

are taken into account for teaching staff with several positions, the average level of employment increases by just under 10 percentage points (blue bars). This value increases again slightly if workloads spent by teachers on school management tasks or on curative education in schools are also taken into account (red bars). If all positions and functions are added together, teachers at primary school level have an average level of employment of 71%.

290 Average level of employment by canton

Calculation based on the employment contracts of primary school level teachers who were only employed in one municipality, 2020–2022

Data: FSO (SSP); calculations: SCCRE

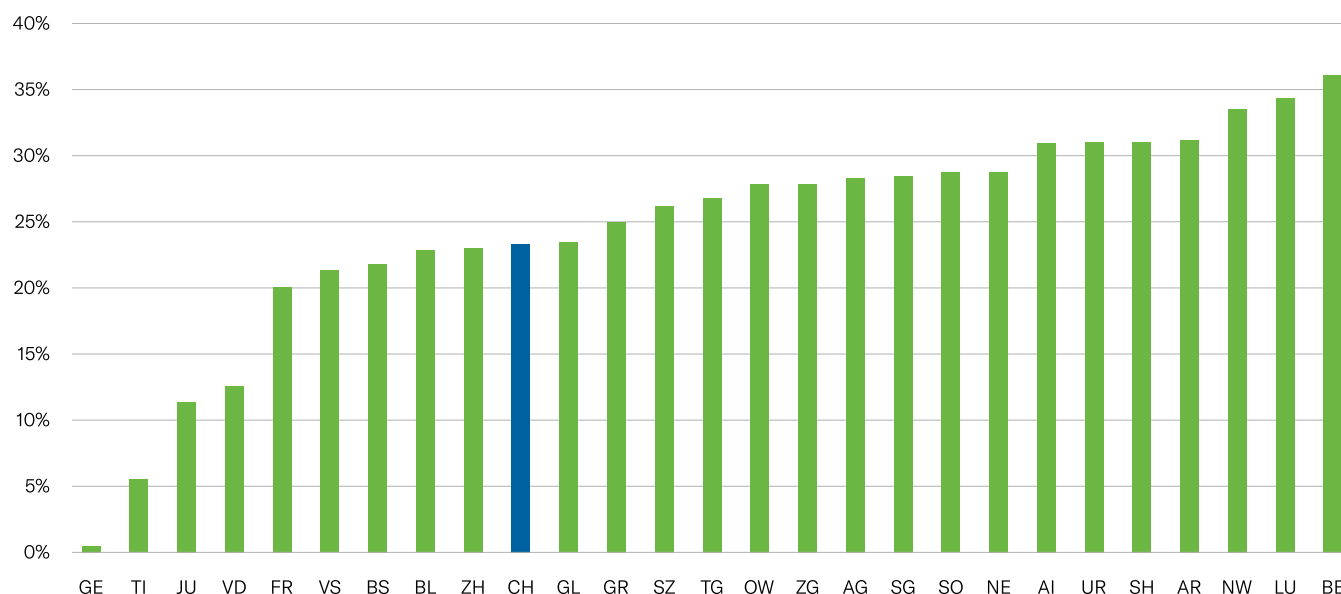


However, the workloads are unevenly distributed within the teaching profession. In half of the cantons, the share of teaching staff with a small workload of less than 50% is above 25%. In the majority of cantons, one in five teaching staff is employed with a small workload (→ Figure 291). Apart from cultural reasons, structural and institutional reasons are the most likely explanations for the cantonal differences, such as the regional school organisation or the conditions of employment and the practice of allocation of workload in the schools. The latter can be seen from the fact that some cantons have a very high proportion of small workloads, while others hardly assign any workloads of less than 50%. In the cantons of Geneva and Ticino, for example, a minimum workload of 50% applies for permanent teaching staff.

291 Part-time teaching staff with small workloads by canton

Proportion of teaching staff by canton with an employment level of less than 50%, 2020–2022

Data: FSO (SSP); calculations: SCCRE



The large cantonal differences between the average levels of employment also make it clear that the low workloads cannot simply be explained by the high share of women in the teaching staff, as only the employment levels, but not the shares of women, vary between the cantons. Even if geographical or organisational reasons may make it difficult to establish greater teaching workloads, it must nevertheless be noted that due to their employment practices, many cantons forego a substantial share of trained teaching staff.

Income prospects

Compared to graduates of other fields of study from all types of higher education institutions, graduates from universities of teacher education have very good salary prospects (→ Figure 292). Teachers at all levels earn above-average entry-level salaries; teachers in lower-secondary and upper-secondary education rank at the top in the wage comparison. They earn higher median salaries at the start of their careers than, for example, holders of a university degree in subjects such as medicine or economics.

With a gross median income of CHF 85,000, teachers at primary school level rank in the upper midfield, ahead of graduates with a university degree in engineering, natural sciences or humanities and social sciences, bearing in mind here that, on the teachers' side, salaries for a three-year Bachelor's degree are compared with salaries for Master's degrees at university level. The variance shown in the teachers' salaries represents primarily the differences between the cantons in a national comparison. Overall, however, these are significantly lower than the wage variance between university graduates. This means that the risk of earning an income that is well below average after graduating is considerably higher for persons in certain

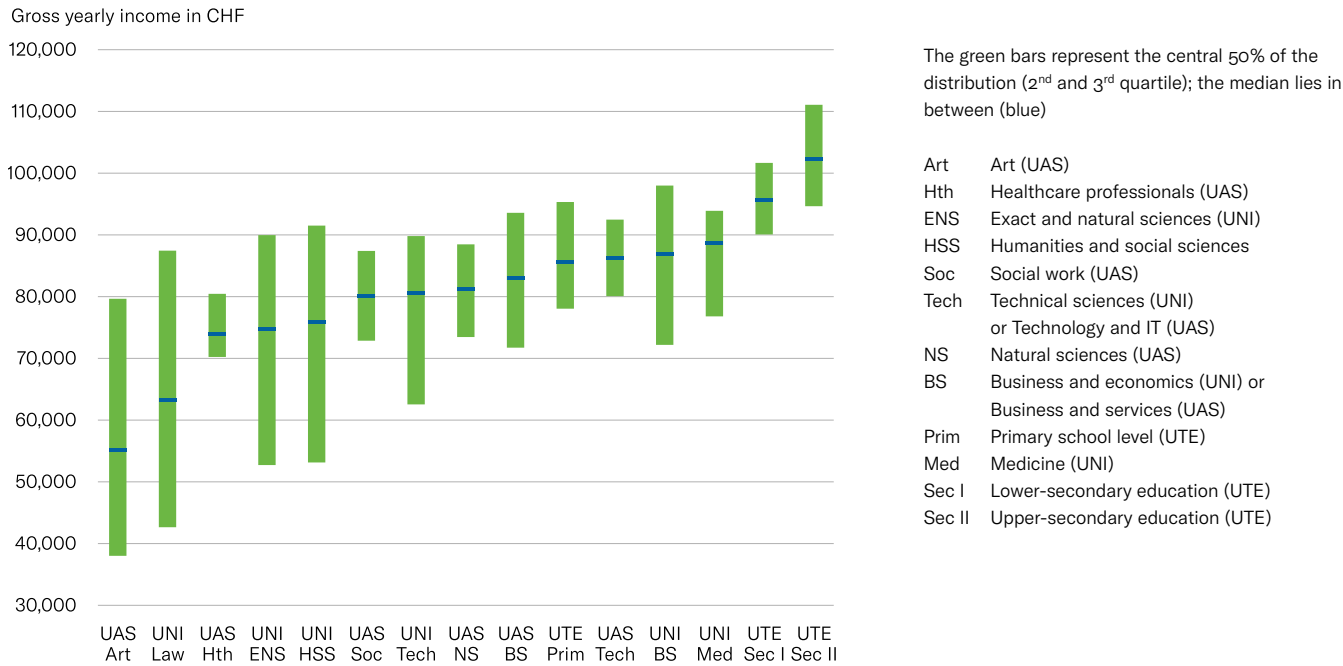
university courses than for those who have completed a course of education at a university of teacher education.

Five years after completion of their studies, baccalaureate school teachers remain in the lead. The median salary of teachers at the lower secondary level five years after completing their studies is at least CHF 100,000, which is on a par with doctors. Primary school level teachers are in the lower mid-field, together with engineers and graduates of the humanities and social sciences. In this comparison, it should be taken into consideration that primary school level teaching staff with a three-year Bachelor's degree at a university of teacher education can keep up with the incomes of Master's graduates from different disciplines at universities even five years after graduation, which has a positive effect on the educational returns for the entire career of the primary school level teachers.

292 Employed income of graduates 1 year after graduation, 2023

Annual gross income estimated using quantile regressions (standardised to 100%), age checked; only persons with a diploma at a UTE who have worked as teachers

Data: FSO (EHA); calculations: SCCRE



UNI: only graduates of the 2nd cycle (Master's, diploma); UAS: only graduates of the Bachelor's programme who have not started a Master's at the time of the survey; UTE primary school: only graduates of the 1st cycle (Bachelor's, diploma), provided they have not started a Master's at the time of the survey and are working as primary school level teachers. UTE lower-secondary level: only graduates of the 2nd cycle who work as secondary school teachers. UTE upper-secondary level: only graduates who work as teachers at upper-secondary level (general education).

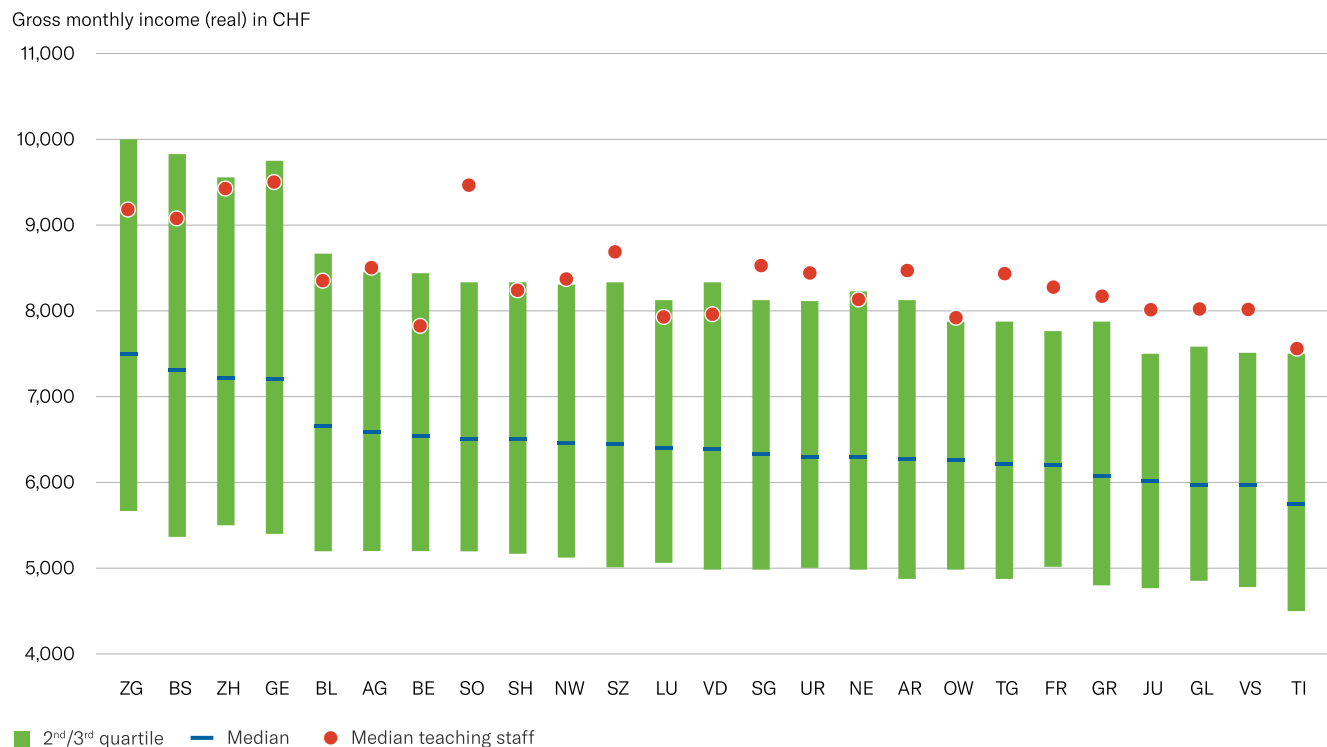
The relative position of teachers in the distribution of wages within a canton depends partially on how salaries in the public sector compare to those in the private sector. It is also determined by the position of the teaching staff within the public service itself. Cantons with a high salary level must ensure that their teaching staff does not fall behind other, comparable professional categories in the regional salary distribution.

Compared to the population as a whole, teachers earn above-average incomes. In most cantons, these are above the third quartile (75th percentile). This can be explained, amongst other things, by the longer training period for teachers. Teachers also perform well compared to persons with a tertiary educational qualification. Their incomes typically exceed the median of this group and are frequently at the top of the third quartile. Although teachers in the four highest-income cantons with urban centres (Zug, Basel, Zurich and Geneva) earn more in absolute terms than in the other cantons, they are below the 75th percentile (→ Figure 293).

293 Relative income position of teaching staff by canton

Position of the incomes of primary teachers (median) in the distribution of all employees (average 50%) by canton; average of the years 2012–2019

Data: FSO (SLFS, SSP), CCO (OASI); calculations: SCCRE



The green bars form the middle 50% of the income distribution (standardised gross monthly income including 13th monthly salary, inflation-adjusted) in the cantons (SLFS data 2012–2019); blue bars: Median. The red dots represent the median of the incomes of teachers (quantile regressions of OASI income, standardised according to the percentage of hours worked in lessons according to the SSP; only primary school level teachers employed in a municipality). The canton of Appenzell Innerrhoden was excluded due to the low number of cases.

Demand for teaching staff

The relevant influencing variables on the demand side are, on the one hand, the number of pupils and, on the other hand, the institutional framework conditions such as the number of lessons, the class size and the student-teacher ratio (→ *chapter Compulsory education, page 33*). Demographic development is an external contextual factor over which the school system has no influence. Unlike the demographics, the institutional factors are very much subject to political and official control. These factors, together with the wage specifications, influence the demand and thus have

an impact on the costs. If one factor is changed, this has an impact on the others. For example, if attempts are made to relieve workload in schools by hiring more staff, this leads to an increase in the supervision factor. This in turn results in a higher demand for teaching staff and thus corresponding funding needs. The demand for teaching staff is thus determined by the interaction of the demographic development and the institutional specifications.

Since the start of 2022, the decline in birth rates which started in 2018 has continued in Switzerland, as in many other European countries. Although a brief increase in births occurred in Switzerland in the second year of the pandemic in 2021, the decline in 2022 was all the greater (*Matthes et al., 2025; FSO, 2025g*). This negative trend continues to this day. This means that a marked decline in pupil numbers is to be expected at primary school level for the years from 2027 onwards, which will continue with some delay over the higher educational levels. An increase is to be expected at lower-secondary level in the coming years due to the strong growth in pupil numbers in recent years (*FSO, 2025g*).

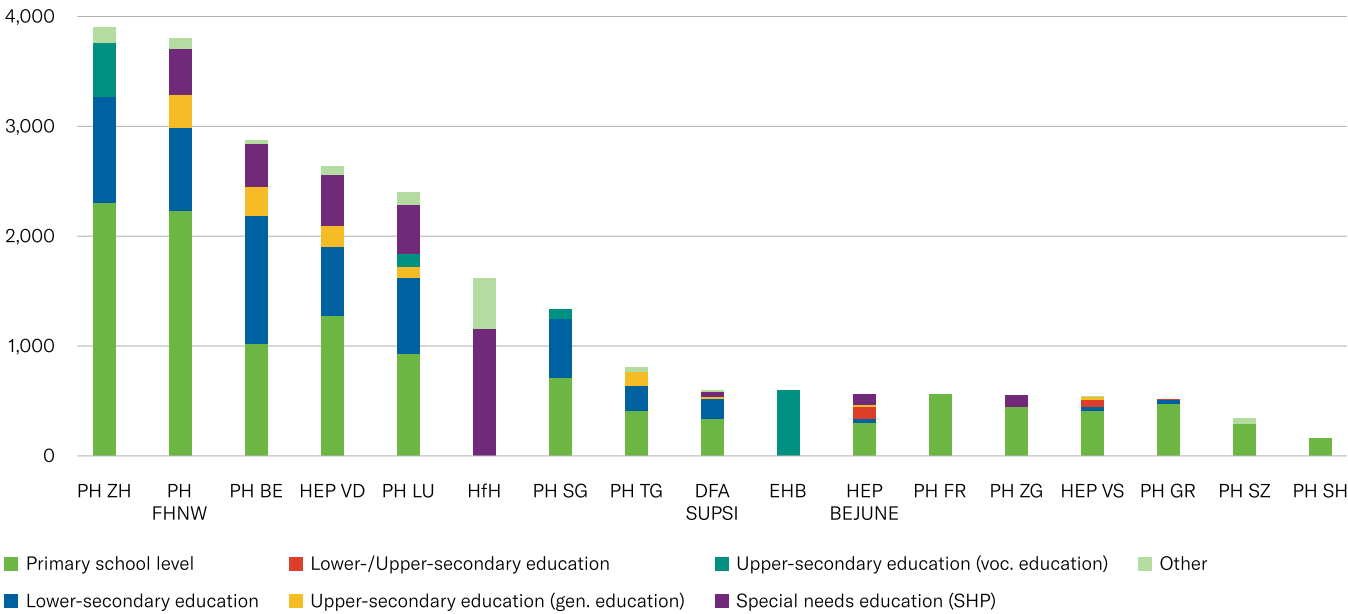
Forecasts for the period after 2030 are subject to greater uncertainty because the longer-term trend in births is unclear and large fluctuations in the short term can also be caused by migration movements. In view of the long waves of demographic development in Switzerland, however, it can be assumed that the large growth in pupil numbers is over and that we will need to prepare for fewer pupils in the medium term. This is mainly due to the decreasing number of the potential parent generation as well as the declining fertility rate.

This has consequences for teaching staff requirements. Three aspects must be considered in this regard. In addition to the declining number of pupils, the future demand for teaching staff will also be dampened by the fact that the number of retirements will also decrease. The last teachers of the baby boomer generations will have left school by 2029. As a result, age-related departures will decrease significantly. Thirdly, universities of teacher education continue to record high admissions. This will lead to an increase of up to 20% in Bachelor's degrees to be expected by 2033 (*FSO, 2025g*). It can be concluded that the situation on the labour market will ease significantly in the coming years and that the period of teaching staff shortage will probably end towards the end of the decade.

294 Students at universities of teacher education, 2024/25

Only students in diploma, Bachelor's or Master's degree programmes (without continuing education and training) of all public law UTE accredited in accordance with the HEdA Switzerland

Data: FSO (SHIS-studex); calculations: SCCRE



Institutions

DFA SUPSI	Dipartimento formazione e apprendimento, Scuola universitaria professionale della Svizzera italiana
EHB	Eidgenössische Hochschule für Berufsbildung
HEP BEJUNE	Haute école pédagogique des cantons de Berne, du Jura et de Neuchâtel
HEP VD	Haute Ecole Pédagogique du canton de Vaud
HEP VS	Haute Ecole Pédagogique du canton de Valais
HfH	Interkantonale Hochschule für Heilpädagogik, Zürich
PH BE	Pädagogische Hochschule Bern
PH FHNW	Pädagogische Hochschule, Fachhochschule Nordwestschweiz
PH FR	Pädagogische Hochschule Freiburg
PH GR	Pädagogische Hochschule Graubünden
PH LU	Pädagogische Hochschule Luzern
PH SG	Pädagogische Hochschule St. Gallen
PH SH	Pädagogische Hochschule Schaffhausen
PH SZ	Pädagogische Hochschule Schwyz
PH TG	Pädagogische Hochschule Thurgau
PH ZG	Pädagogische Hochschule Zug
PH ZH	Pädagogische Hochschule Zürich

Teachers at compulsory school level are trained in Switzerland mostly at universities of teacher education. These offer degree programmes for training teachers at primary school level, lower-secondary level, and in some cases also at upper-secondary level, as well as for teachers of special needs education². Education is completed with an academic degree at Bachelor's or Master's level. The actual professional qualification is certified by a teaching diploma for the respective school level, which is recognised by the Swiss Conference of Cantonal Ministers of Education (EDK).³ With this recognition procedure, the EDK ensures uniform minimum requirements for the training institution, the admission conditions for studies, the training and the qualifications of lecturers; it thus ensures freedom of movement for career access throughout the country and international recognition of training. All fourteen universities of teacher education under public law which offer degree programmes for teaching at compulsory school level are accredited today as “universities of teacher education” according to the Higher Education Act. In addition, there are also two specialised higher education institutions: the University of Curative Education (HfH) and the Swiss Federal University for Vocational Education and Training (SFUVET), which are both accredited as “universities of teacher education”

2 According to the EDK, the area of special needs education comprises “early curative education” and “curative education in schools” (Regulations on the Recognition of University Diplomas in Special Needs Education of 22 June 2023). Other therapeutic pedagogical teaching professions such as psychomotoric skills are summarised in Figure 294 in the category “Other”.

3 Regulation on the recognition of teaching diplomas for teaching at primary level, lower secondary level and baccalaureate schools of 28 March 2019 (rev. 25/10/2024).

(→ Figure 294). Finally, two private providers are also accredited as universities of teacher education. However, these make up just over one percent of all students. In addition, around 7% are completing their education at a university (→ Figure 295).

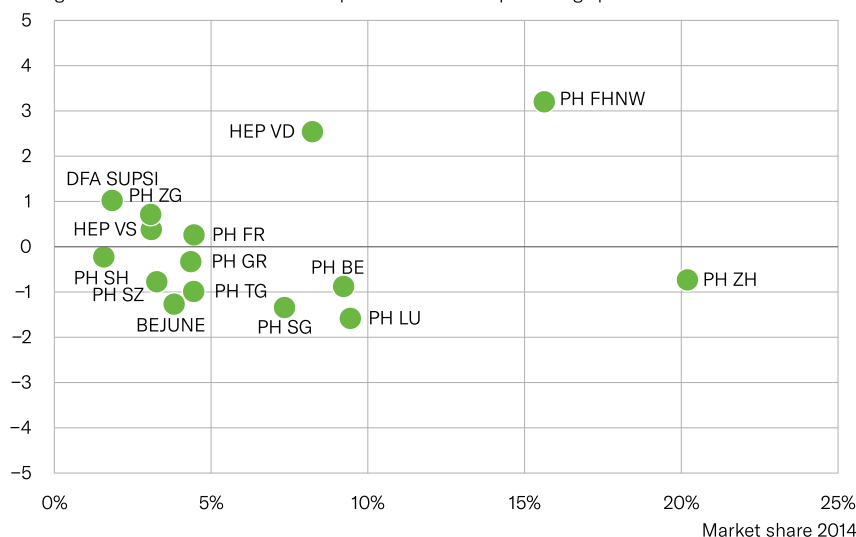
The individual higher education institutions differ significantly in size. The five largest universities of teacher education, each with more than 2,000 students, train two-thirds of all future teaching staff, while the remaining twelve with sometimes less than 500 students train the other third. Because the universities of teacher education, in the view of their sponsors, must primarily ensure education for the local market, the small higher education institutions also generally cover all degree programmes for training teachers in compulsory education: Pre-school, primary school, lower-secondary education and special needs education.

296 Development of the market shares of the universities of teacher education in the last 10 years

Market shares in 2013/24 and 2023/24, measured as a share of the total number of students in the primary school level degree programme in Switzerland as a whole

Data: FSO (SHIS-studex); calculations: SCCRE

Changes in the market share 2024 compared with 2014 in percentage points

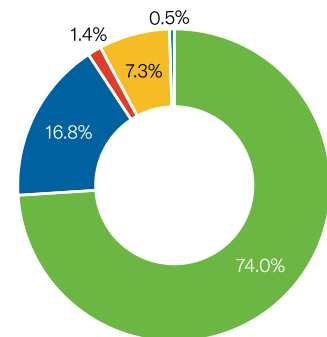


Despite the large number of providers in a small space, the market shares of the universities of teacher education have hardly changed. At higher and medium-sized higher education institutions, there have been only small changes of the order of 2 to 4 percentage points over the past ten years. The small higher education institutions have hardly changed their market share of around 2 to 5% each (→ Figure 296). This is a further indication that the individual higher education institutions cover a relatively clearly defined regional offering and are not subject to excessive competition. One possible explanation of this situation lies in the cantonal sponsorship of practically all universities of teacher education. For many smaller cantons, it is not attractive to operate a university that is as large as possible, as this involves considerable infrastructure costs. There is also a risk that a large share of trained teaching staff will later work in other cantons. Most

295 Teacher education students by higher education type, 2024

All degree programmes (without continuing education)

Data: FSO (SHIS-studex); calculations SCCRE



- Autonomous UTE
- UTE integrated into a UAS
- Private UTE
- UNI institutes
- UAS institutes

The UTEs train more than 90% of all students in the degree programmes for teaching professions. They primarily cover education for the stages of compulsory education. At UNI, one-third of all students study in upper-secondary degree programmes (mainly baccalaureate school). Only the universities of Geneva and Fribourg offer teacher training for all educational levels. In the canton of Fribourg, teacher training was transferred from the UTE to the university. Since autumn 2025, all teaching staff have been trained at the Department of Teacher Education at the University of Fribourg. The universities of applied sciences HES-SO, ZHdK and HSLU offer specialised courses for teaching in the fields of psychomotoric skills, music and the visual arts. The two private universities of teacher education – the NMS Bern Institute for Teacher Education, which trains teachers for primary school level, and the University of Applied Sciences for Speech and Language Therapy Eastern Switzerland (HLO) – are financially supported by the canton in which they are located and receive contributions in accordance with the Intercantonal Agreement on Universities of Applied Sciences (FHV). The following analyses are limited to the public sector universities of teacher education.

cantons therefore run their own universities of teacher education with the hope of being better able to cover their own requirements for teaching staff and not having to poach school staff from a different canton.

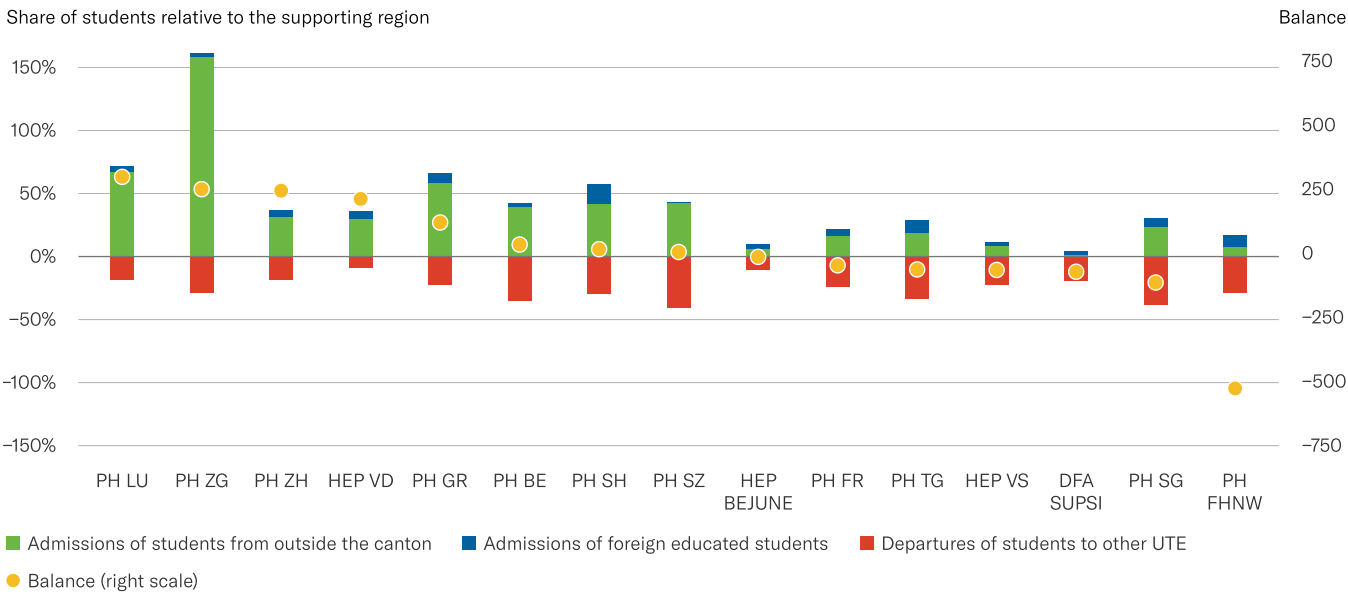
Inter-cantonal mobility of students

Despite the large number of local higher education institutions, the cantons in principle encourage the freedom of students in their choice of higher education institution by, as cantons of residence, making contributions to the costs of education to the sponsors of higher education institutions to cover these costs. The inter-cantonal financial burden in the area of the universities of teacher education is shared through the Intercantonal Agreement on Universities of Applied Sciences (FHV)⁴. Smaller cantons are therefore faced with the choice of having their own higher education institution to finance the education of the inhabitants of their canton themselves, or to forego this and pay cost contributions (in accordance with FHV) to the sponsors for education at non-cantonal higher education institutions.

297 Origin of students at universities of teacher education

Shares of the UTE students (primary level) 2024/25 who come from outside the supporting region and the students who study at a UTE outside the supporting region, relative to the total of the UTE students of the supporting region, balance (absolute): only students in Switzerland (right scale)

Data: FSO (SHIS-studex); calculations: SCCRE



4 Intercantonal Agreement on Universities of Applied Sciences (FHV) of 12 June 2003.

On average throughout Switzerland, only about 25% of students resident in a specific canton or in a region with a university of teacher education are educated outside of their region of origin. However, as not all cantons run universities of teacher education, around 34% of future teaching staff do not study at a university of teacher education of their supporting canton or their supporting region. At around 6%, the share of international students is relatively low compared to the other types of higher education institutions, although it varies widely from one higher education institution to another (→ Figure 297). Some higher education institutions are successful in reducing their negative migration balance somewhat with foreign students. Financially, however, acquiring students from abroad does little to contribute towards offsetting costs, because these students are not subject to UAS agreement contributions. Foreign students only pay somewhat higher tuition fees.

When it comes to assessing the expediency of having an own university of teacher education, the degree of market utilisation is an important parameter. This key figure indicates the share of students from the supporting region that the local higher education institution is able to recruit relative to the total of all its own students at universities of teacher education (→ Figure 298). For example, the University of Applied Sciences and Arts Northwestern Switzerland – which loses the most students to other higher education institutions in absolute numbers – still makes use of more than 70% of the regional market within the four cantonal supporting regions.

Possible explanations for the different quotas in the mobility of students at the individual higher education institutions must be sought in the individual study decisions and self-selection mechanisms of the students. These are likely to be influenced not least by institutional and cultural factors or by the reputation of a higher education institution. However, the available higher education institution data does not allow an empirical examination of these different explanatory approaches.

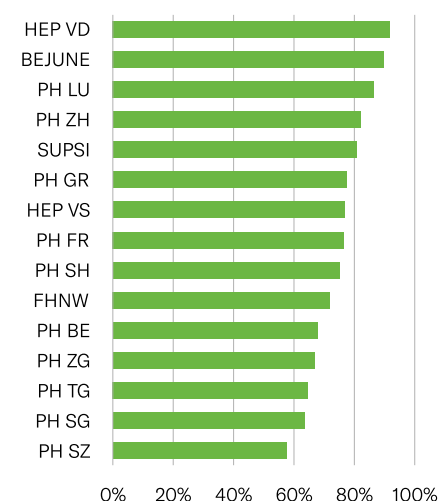
Admission to the universities of teacher education

The admission practice of the higher education institutions does not only influence the selection by the higher education institutions themselves, but also the self-selection of the students and thus the future composition of the teaching staff. Nationwide requirements exist for admission,⁵ which, however, allow the individual universities of teacher education a relatively wide scope. In accordance with the revised Recognition Regulations of the Swiss Conference of Cantonal Ministers of Education, admission to training programmes for teaching at compulsory education requires an academic baccalaureate or a passed supplementary exam (UAT) to prove equivalence to the academic baccalaureate (Art. 4 para. 1 ARLD). Holders of the specialised baccalaureate in pedagogy are also admitted to the primary school level degree programme (Art. 4 para. 2 ARLD). In addition, the regulations provide for specific procedures with an examination and a certificate of equivalence for the admission of persons who have obtained a vocational or

298 Market utilisation rate

Share of students (degree programme primary school level) from the supporting region in relation to the total of all UTE students (degree programme primary school level) in the supporting region, 2024/25

Data: FSO (SHIS-studex); calculations: SCCRE

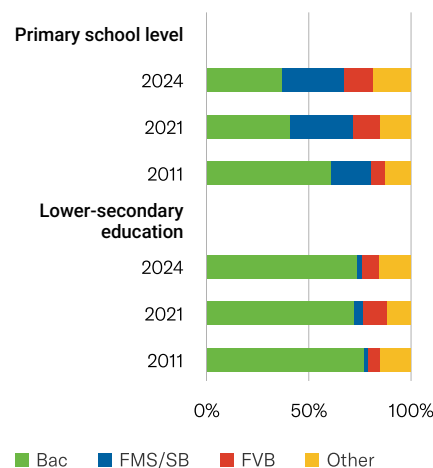


⁵ See Higher Education Act (HEdA) of 30 September 2011 and the regulation on the recognition of teaching diplomas for teaching at primary level, lower-secondary level and baccalaureate schools (ARLD) of 28 March 2019.

299 Admissions by admission qualification

Primary school level: Admissions to the Bachelor's degree programme; lower-secondary education: Admissions to the Bachelor's degree programme, except HEP BEJUNE, DFA SUPSI and HEP VS, where admission to the lower-secondary level degree programme only takes place at Master's level

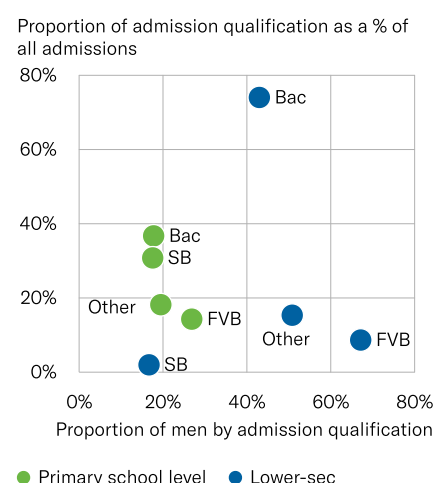
Data: FSO (SHIS-studex); calculations: SCCRE



300 Share of men by admission qualification and degree programme

UTE admissions, 2024/25; only admissions to the Bachelor's degree programme, except HEP BEJUNE, DFA SUPSI and HEP VS where admission to the lower-secondary level degree programme only takes place at Master's level

Data: FSO (SHIS-studex); calculations: SCCRE



Reading example

Among admissions with a FVB to the lower-secondary level degree programme, the proportion of men is highest at 67%. Overall, however, FVB accounts for just under 9% of all study admissions.

specialised baccalaureate (FVB/SB) with a non-educational focus or other upper-secondary level qualifications (certificate of equivalence to the specialised baccalaureate in pedagogy by means of a supplementary exam by the admitting higher education institution; cf. Art. 4 para. 3a ARLD). Finally, career-changing students with professional experience have the option of being admitted on the basis of a documented procedure “sur dossier” (background briefing) (Art. 4 para. 3b ARLD).

The consequence of these institutional specifications is that the students at universities of teacher education can provide a more heterogeneous profile with regard to their prior education at higher secondary levels than students in university degree programmes. Thus ten years ago, for example, around 40% of the students who entered the degree programme for primary school level did not have an academic baccalaureate (Bac) (→ Figure 299). This proportion has increased strongly since then and is over 60% today. The relationship between students holding an academic baccalaureate and those with other qualifications has thus been reversed. In the lower secondary level study programme, the situation has changed significantly less over time. The majority of students in this degree programme continue to hold an academic baccalaureate (→ Figure 299).

The increase in admissions of persons without an academic baccalaureate to the primary school level degree programme is also a consequence of the expansion of upper-secondary specialised schools (FMS) and the opening of access via the specialised baccalaureate in pedagogy (→ *chapter Upper-secondary education, page 111*). This path is predominantly chosen by women (Leemann et al., 2022; Hafner, 2022). Around 25% of men graduate from a university of teacher education (→ Figure 300) via a vocational training qualification. It must be taken into account that the federal vocational baccalaureate only accounts for just under 15% of student admissions. Admission with a federal vocational baccalaureate requires proof of equivalence to the specialised baccalaureate in pedagogy for the primary school level degree programme and proof of equivalence to the academic baccalaureate by means of a supplementary exam (Passerelle) for the lower-secondary education degree programme. Taking into consideration the current shortage of teachers, there are various political proposals calling for examination-free access to the primary school level degree programme to be extended to persons with a federal vocational baccalaureate (*Federal Council, 2025; Eberle, 2024*). However, it is not possible to estimate the extent to which this would increase the number of student admissions and, in particular, the proportion of men in admissions to the primary school level degree programme.

Student admissions with an academic baccalaureate are not only direct admissions, but also students who switch to a university of teacher education after discontinuing their studies at a university. According to longitudinal analyses with higher education institution data, the universities of teacher education record around 10 to 16% of admissions of persons who have dropped out of a university course in the degree programmes for compulsory education (→ Figure 301). This means that around a quarter of all baccalaureate students at universities of teacher education did not choose this training directly, but only in a second stage after a period of study at a university.

Alternative forms of study

In order to appeal to new target groups and to better cater to the realities of their students' lives, the universities of teacher education have established flexible forms of study. This includes the option of studying part-time with reduced face-to-face teaching. Self-study, individual supervision and on-line courses also enable students to complete their studies alongside family responsibilities or a job. In addition, professionals from the age of 27 are enabled to change careers and join the teaching profession. Admission is on a regular basis or by means of an individual "sur dossier" (background briefing) procedure. The training can be completed in conjunction with a supervised teaching activity as part of a paid part-time position at the target level (Art. 8 para. 4 ARLD) or on a shortened basis – corresponding to the recognition of non-formal educational achievements. The share of career changers and part-time students varies from one higher education institution to another. In recent years, however, it has risen steadily and is now on the Swiss average at 11% (→ Figure 302). There is little reliable evidence regarding the success of flexibilisation of degree programmes (*Ghassemi Tabrizi, 2024*). In Switzerland, the programmes have only been in place for a few years. Basically, they are always caught between the quality requirements of professional training and the goal of supplying as many trained staff as possible to the education system. According to the international research literature, the success of alternative qualification programmes in terms of human resources management is not clear; any relevant analyses have so far been lacking in Switzerland (*Bauer & Kost, 2023*). However, with regard to the quality of the training of career changers, the system used is generally awarded a good certificate based on the uniform guidelines of the Swiss Conference of Cantonal Ministers of Education and the minimum requirements (*Bauer & Kost, 2023*). Compared to regular students, career changers generally exhibit favourable motivational entry conditions as well as similar requirements for the teaching profession (*Troesch et al., 2019*).

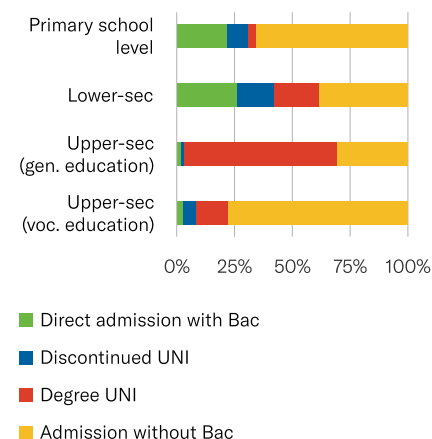
Academic skills of students

The selection for the different types of higher education institutions is also based on academic skills. These selection patterns can be observed using longitudinal data linked to a standardised performance measure such as PISA. However, due to a lack of performance data at the time of completion of upper-secondary education, data from the compulsory educational level must be used. Taking into account the performance data from the review of the national education objectives (ÜGK) in the 11th grade, the analyses of educational pathways show that higher-performing young people are more likely to choose a course of study at a university; the performance distribution of students at UAS and UTEs is comparable (→ Figure 303).

301 Previous education before UTE studies, 2023/24

Share of admission to UTEs with a Bac and previous education at a UNI

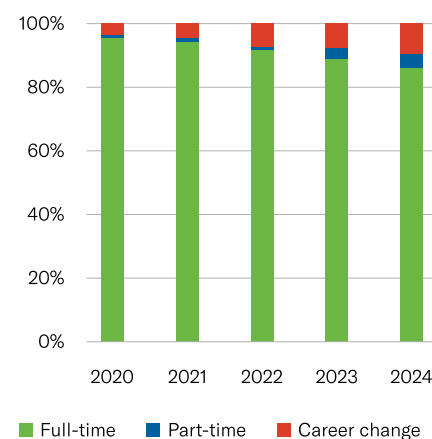
Data: FSO (LABB); calculations: SCCRE



302 Type of study, 2020–2024

Admissions to the Bachelor's degree programme at primary school level or lower-secondary education level

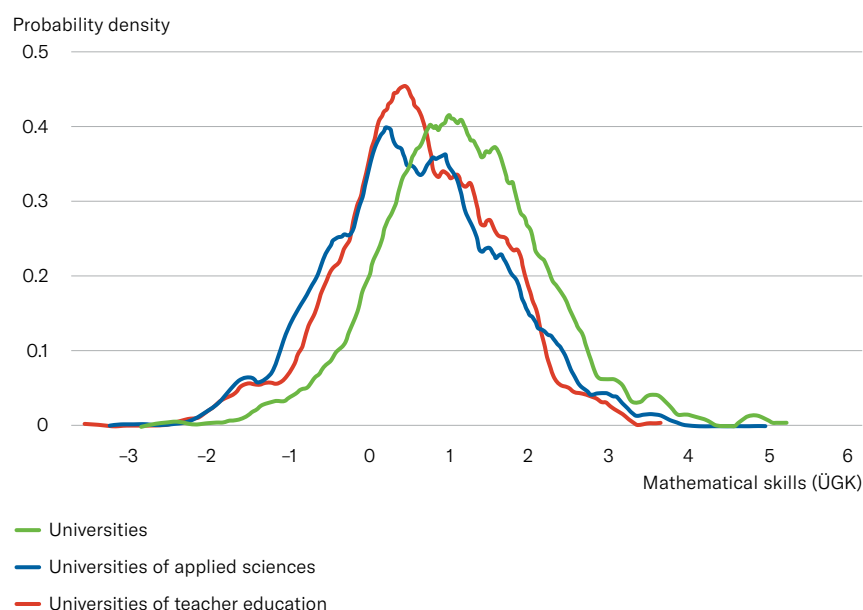
Data: FSO (SHIS-studex); calculations: SCCRE



303 Mathematical skills by higher education institution type

Distribution of mathematical skills (ÜGK 2016) of persons entering a higher education institution, 2023

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE



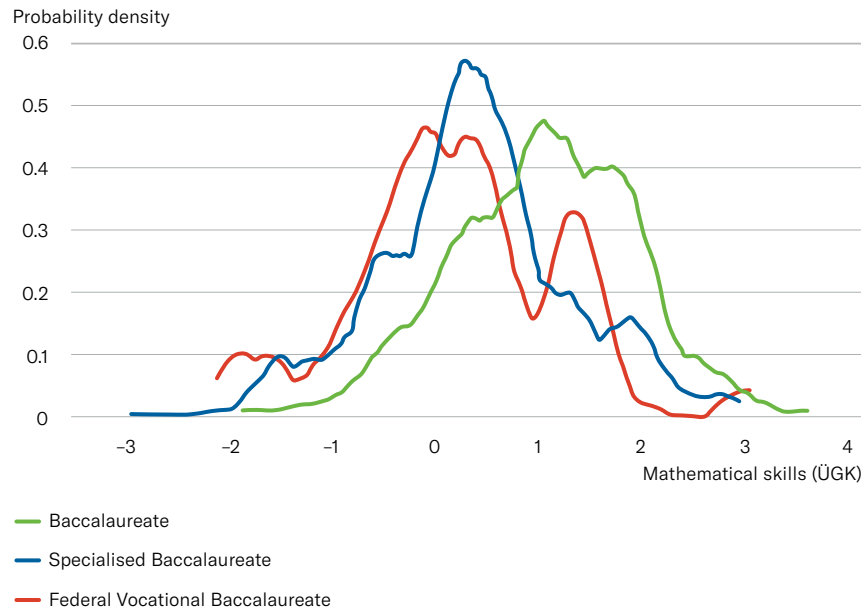
The differences in skills that we observe among students at the different types of higher education institution can also be explained by the school system at upper-secondary education, which differentiates according to achievement (→ *chapter Upper-secondary education, page 111*), in which young people choose different types of education according to their abilities or are selected by secondary schools according to their skills (for example, by means of a baccalaureate entrance examination).

The differentiated school system at upper-secondary education means that, despite overlaps, the study qualifications that depend on the type of school (academic, specialised or federal vocational baccalaureate) are associated with different academic performance. This also applies to the performance measured in the review of the national education objectives at the end of compulsory education. However, the differences are also likely to be visible at the end of upper-secondary education, not least because the increase in performance also depends on the type of school (*Angelone, 2019*). These differences in performance, which are dependent on the previous education and the admission qualification, are also observed among students at the universities of teacher education (→ Figure 304).

304 Mathematical skills of UTE students by baccalaureate type

Distribution of mathematical skills (ÜGK 2016) of persons entering a UTE, 2023

Data: FSO (LABB), EDK (ÜGK): SCCRE



Students at a university of teacher education who hold an academic baccalaureate have, on average, a significantly stronger performance in mathematics than students with a different educational background. On the other hand, students at universities of teacher education with a specialised or federal vocational baccalaureate do not differ greatly with regard to their performance in mathematics.

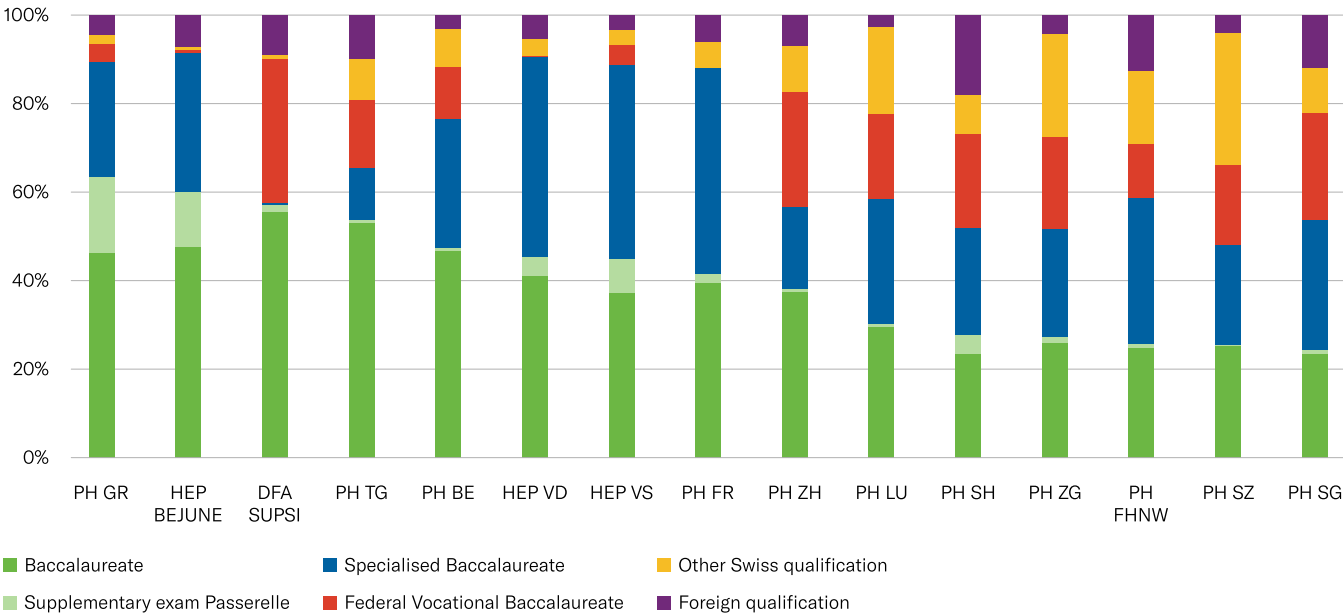
Of the three types of higher education institution, the study population at the universities of teacher education as a whole is the most heterogeneous in terms of previous education and admission qualifications (→ *chapter Tertiary-level education, page 189*). However, there are major differences between the individual universities of teacher education (→ Figure 305).

As far as the career path leading to a teaching profession is concerned, the differences between the individual universities of teacher education reveal different traditions on a regional level. While in most cantons in Western Switzerland, the path via the academic baccalaureate is the rule, a number of German-speaking cantons have access via the upper-secondary specialised schools, at least for the primary school level. This is also due to the fact that the share of pupils in general education programmes at upper-secondary level varies from one canton to another. Accordingly, students with different baccalaureates are studying at the universities of teacher education, although the shares of the individual types differ. As a result of the various different cantonal practices in transitioning to upper-secondary education, the distribution of student performance also varies (→ *chapter Upper-secondary education, page 111*).

305 Admissions by admission qualification and higher education institution

Admissions to UTEs (degree programme at primary school level), 2022–2024; only UTEs under public law; the category “other Swiss qualification” also includes the university’s own admission procedures (including “sur dossier” procedures).

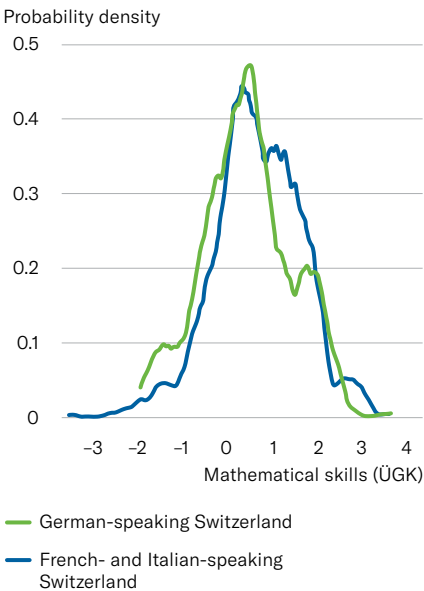
Data: FSO (SHIS-studex); calculations: SCCRE



306 Mathematical skills by language region

Distribution of mathematical skills (ÜGK 2016) of people entering a UTE

Data: FSO (LABB), EDK (ÜGK); calculations: SCCRE



This is also the reason why the differences in performance between the admission qualifications described in Figure 304 cannot be generalised for all cantons. In other words: Based on the high share of persons with a baccalaureate studying at the Haute Ecole Pédagogique des cantons de Berne, du Jura et de Neuchâtel (HEP BEJUNE), it cannot be concluded that their students on average perform better than, for example, those at the university of teacher education in St. Gallen, where the share of students with an academic baccalaureate is low. This assumption can also be put into perspective when comparing skills between the language regions: With regard to the mathematical skills measured in the achievement of basic competencies assessment, German-speaking students at the universities of teacher education do not differ substantially from their French- or Italian-speaking fellow students (→ Figure 306).

The different cognitive performance of prospective teachers is certainly relevant in terms of system effectiveness, as there are various indications of the correlation between the cognitive abilities of teachers and the increase in performance of pupils (Hanushek et al., 2019; Enzi, 2017; Bardach & Klasen, 2020; Rockoff et al., 2011).

Effectiveness

The effectiveness of the universities of teacher education should provide information on how well they have provided the prospective teachers with the skills and competences relevant for practising the profession which enable them to optimally support their pupils' learning and to improve their skills. Effectiveness determined in this manner would have to be based on a causal chain, which would first have to establish a causal link between the higher education and the teachers' skills and secondly, a similar one between the skills of the teachers and those of the pupils. For this purpose, it would have to be possible to take into account the personal, cognitive and motivational requirements of the students at the start of their studies as well as the corresponding requirements of the children and young people they teach. As it is very difficult to identify such relationships on a causal basis due to the lack of data and the methodological challenges, the research literature is primarily limited to individual aspects – on the one hand, the relationship between the characteristics and traits of teachers and the learning of pupils (*Bardach et al., 2022; Blömeke et al., 2022; Hanushek et al., 2019; Rockoff et al., 2011*), as well as, on the other hand, skills development and professionalisation through education and continuing education (*Blömeke et al., 2011; Darling-Hammond, 2012, 2023; Gröschner & de Zordo, 2021*). However, the complexity of the field of research, different theoretical concepts and the variety of research designs and methods make it difficult to draw general conclusions. In addition, there is a lack of long-term studies and comparability is difficult due to the high level of heterogeneity of training models in the different countries and education systems.

Self-selection in education and profession

When it comes to teacher training, it is crucial who aspires to the teaching profession and undertakes the relevant training. Self-selection processes as well as admission regulations and selection procedures by the higher education institutions play a key role in determining the entry requirements and motivational disposition of students. Entry requirements play an important role in building skills during training; they influence graduation and career entry (*König & Rothland, 2012; Kunter et al., 2013; Rockoff et al., 2011; Watt et al., 2012*).

The self-selection of prospective teachers and the resulting skills throughout the teaching staff are also key with regard to the entire education system and its effectiveness. This is because the effectiveness of the education system depends not only on the average skills of the population as a whole, but also on the relative abilities of the persons who choose to teach. Based on the PISA data, it is possible to determine, for those countries participating, from which competence area young people with the career goal of teacher originate relative to the national population (→ Figure 307). This type of comparison gives an indication of the national recruitment potential for teachers, both in terms of cognitive abilities as well as social status, which ultimately allows conclusions to be drawn about the effectiveness of the national education system (*Piopiunik et al., 2014*).

Research on the effectiveness of teacher training

Politicians, academics and practitioners are increasingly striving to empirically record the training of teachers, to base training content on scientific evidence and to examine the effectiveness of training. For example, the UK Education Endowment Foundation, which was set up to promote evidence-based approaches in education, presented a large-scale meta-analysis on the effectiveness of teacher education and continuing training, which considered only experimental studies (*Sims et al., 2021*). In Switzerland, the umbrella organisation of the universities of teacher education has set itself the task of "strengthening the evidence base in teacher education" as part of its research strategy and published a corresponding report (*Brühwiler et al., 2024*).

Research on the acquisition of skills

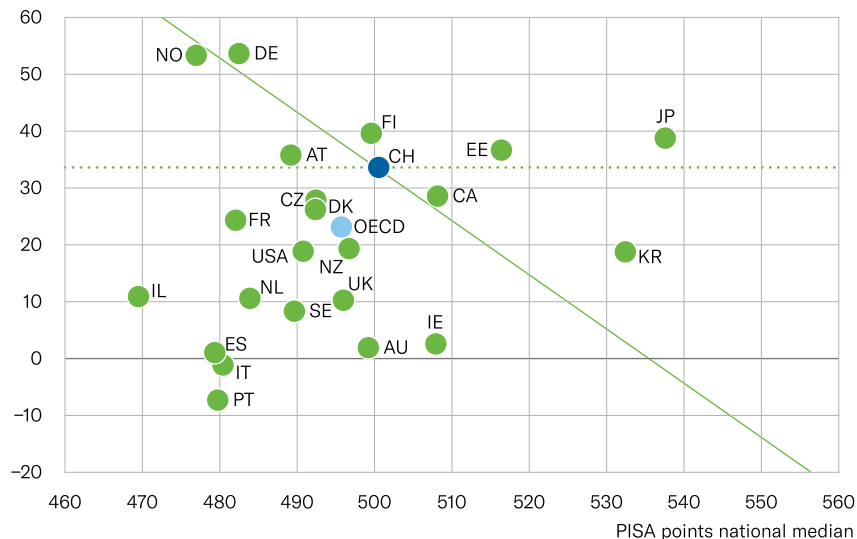
Empirical proof of the effectiveness of teacher education still remains very difficult. The lack of a common theoretical basis in the field of research makes convincing conceptualisations of the central construct of teacher skills as well as the development of generally accepted instruments difficult (*Blömeke et al., 2008*). Data for representative, supra-regional analyses on the effectiveness of teacher education in Switzerland is also lacking. Corresponding research is therefore limited to sub-aspects such as skill development in certain subject areas, in subject didactics, in particular in practical vocational training (*Baumgartner, 2022; Baumgartner et al., 2023; Brühwiler & Vogt, 2020; Festner et al., 2020; Košinár & Laros, 2022; McCombie & Guldemann, 2022*) or in the area of digital transformation (*Tarantini et al., 2023*).

307 Relative skills of future teachers

PISA performance (mean value of reading, mathematics and natural sciences) of 15-year-olds with the career goal of teacher (compulsory education) compared to the population as a whole; the green line represents the isoline of the PISA performance of future teachers: All points on it represent countries in which pupils with the career goal of teacher have the same PISA performance.

Data: OECD (PISA 2022); calculations: SCCRE

Deviation of future teachers from the national median



Reading example

In Germany and Norway, young people achieve poorer PISA scores on average than in Switzerland (see position on the x axis), but because young people with the career goal of teacher in Germany or Norway do better than in Switzerland relative to the national average (see greater distance from the national median on the y axis), they are comparable in terms of performance with young Swiss people who are interested in teaching. In Austria or Japan, self-selection is roughly comparable to that in Switzerland (position on the y axis), but because Austria scored more poorly in PISA, young people with the career goal of teacher there perform more poorly in PISA. Conversely, the higher average PISA score in Japan means that young Japanese people with the career goal of teacher achieve a significantly higher PISA score than in Switzerland.

The green line identifies countries in which 15-year-olds with the career goal of teacher have a PISA performance comparable to that of Switzerland, irrespective of the respective national average for PISA: To the right of the green line are countries in which young people who perform higher than in Switzerland are interested in teaching, while to the left of the straight line are countries in which young people who perform lower are interested in teaching. The data does not enable any conclusions to be drawn about the effective quality of future teachers, but indications of the popularity and status of the teaching profession can be derived. The higher the status, the sooner the most talented will decide on the job.

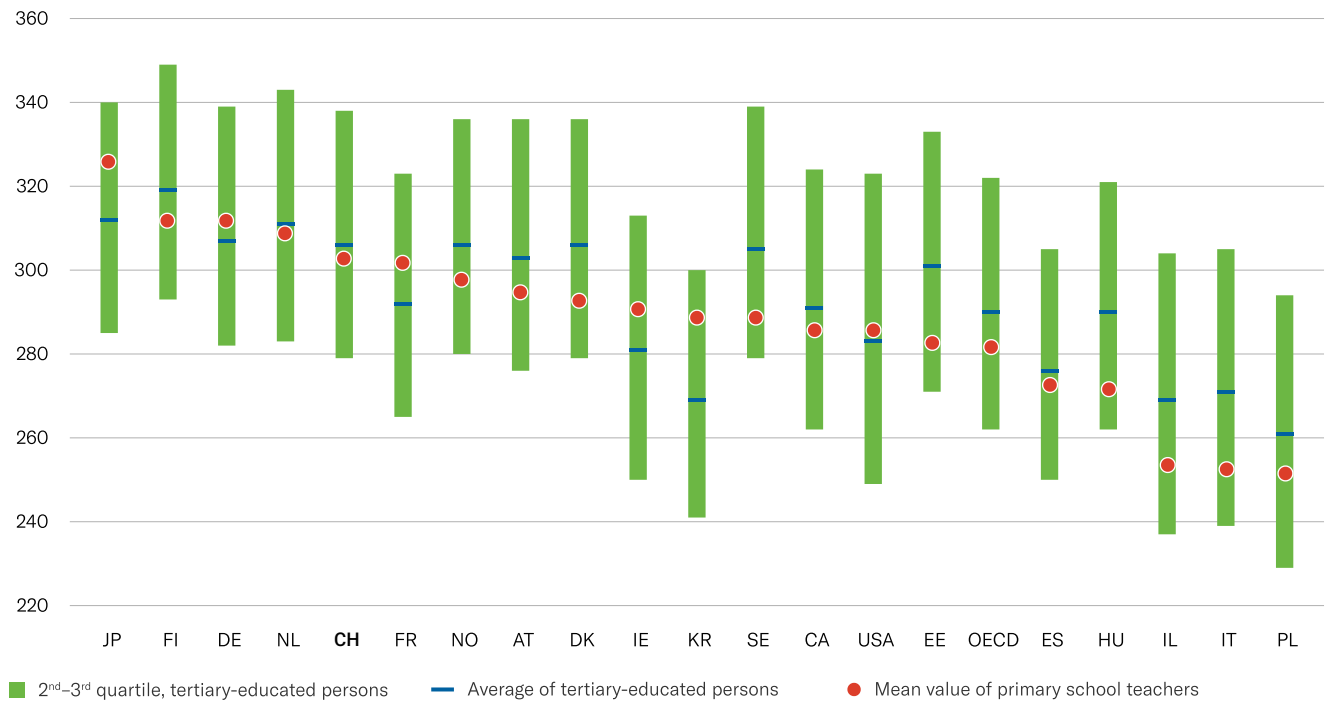
The new data from the OECD Adult Competency Survey (PIAAC) enables the skills of teachers to be compared with those of other persons holding a higher education diploma. In most countries, primary school teachers originate predominantly from the second quartile of the division of skills of university graduates, in some cases with a significant downward deviation from the median (→ Figure 308). Even if the relative skills of teachers are comparable, substantial differences exist between the countries. These differences reflect the differences in the adult population measured in the PIAAC study.

308 Skills of teaching staff and tertiary-educated persons, 2023

Average mathematical performance of primary school level teachers in the PIAAC study and distribution of competences of tertiary-educated students

Data: OECD

Mathematical skills (PIAAC)

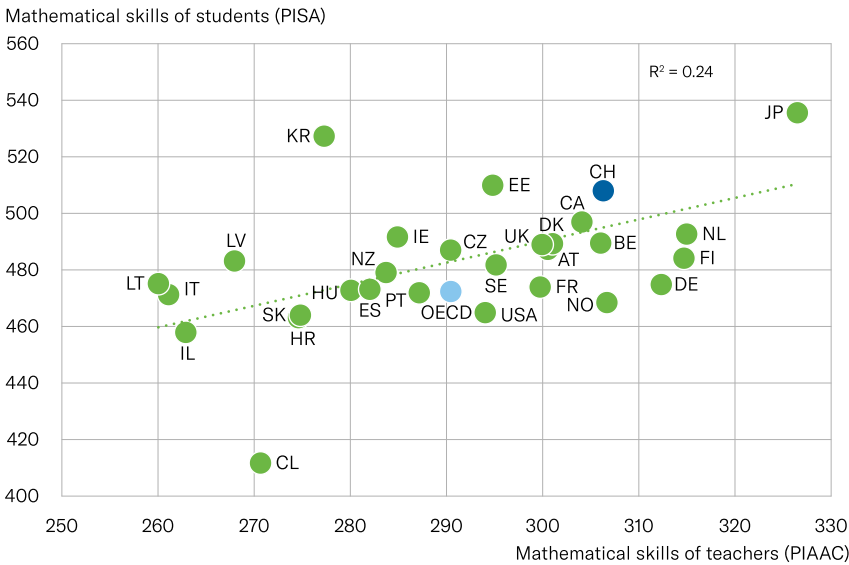


While the relative position of the teaching staff allows conclusions to be drawn regarding the appeal of the teaching profession in the respective country, the effective skills of the teaching staff point to the quality of the education system as a whole and thus ultimately to the pupils' learning. The latter tend to perform better in countries with higher-performing teachers in PISA (→ Figure 309). As the study by Hanushek et al. (2019) shows, this correlation is causal.

309 Mathematical skills of teachers and pupil performance

Average mathematical performance of teachers (all levels) in PIAAC and pupil performance in mathematics in PISA

Data: OECD

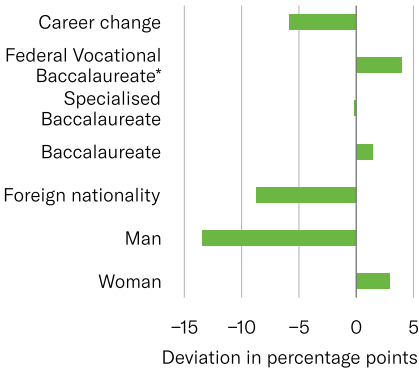


With the lowering of the admission requirements at the universities of teacher education, the self-selective processes become more important; they lead to a greater heterogeneity of the skills of the future profession. This raises the question of whether new forms of systematic selection and aptitude assessment are needed when starting studies and on the basis of which criteria such measures would have to be carried out (*Bieri Buschor & Schuler Brunswick, 2018; Krammer & Pflanzl, 2019*). The long-term effects of a liberal admission practice (such as direct access with a federal vocational baccalaureate) would need to be analysed in more detail with regard to the question of system performance and possible management approaches. This would require longitudinal analyses with data on previous education, admission and the course of studies as well as longer-term outcomes. Alternative career options for potential teachers would also have to be taken into account, especially as it has been shown that economic conditions at the time of the start of career also have a role to play in determining the skills available in teaching staff (*Nagler et al., 2020*).

310 Study success rates

Success in the Bachelor's programme at primary school level at UTE, 6 years after commencement of studies (admissions 2015–2017); deviation from the average graduation rate of 83% for individual characteristics

Data: FSO (LABB); calculations: SCCRE



* Vocational baccalaureate with equivalence test

Reading example

The graduation rate of foreign students is 9 percentage points below the average.

Study success rates

In addition to the effectiveness of the actual training, the success of the degree programme (→ Figure 310) is also dependent on the entry requirements of the students, in particular their previous academic performance (*Larsen et al., 2013; Diem, 2021*), the admission practice and the selectivity of the degree programme itself. In addition to cognitive abilities, non-cognitive abilities such as conscientiousness also prove to be predictive of academic success (*Weissenbacher et al., 2019*), according to an Austrian analysis of students at universities of teacher education. However, as long as neither the entry selection nor the completion of studies are conducted under uniform

conditions, a statement about the effectiveness of the individual universities of teacher education makes little sense. On the other hand, certain differences can be identified in the overall Swiss average (→ Figure 310). This shows that men, foreign students and career changers have a significantly lower graduation rate than the average student. Based on the available data, however, it is not possible to state whether the observed differences are due to poorer study conditions or lower motivation.

Teaching activity during studies

Many students at universities of teacher education are already working as teachers at schools during their training, often on a permanent basis. These are not training-related internships, but rather study-independent, unsupervised and partly non-subject-related teaching activities (*Scheidig & Holmeier, 2022*). Based on the data from the graduate survey conducted by the Federal Statistical Office (FSO), it can be concluded that the paid employment of students at universities of teacher education related to their studies is highly likely to be teaching. This is the basis for the finding that more than 40% of students in the lower-secondary level degree programme regularly engage in paid teaching activities (→ Figure 311). This effectively brings the start of a career forward, which could actually be taken into account in the practical vocational training (*Kreis & Güdel, 2023*).

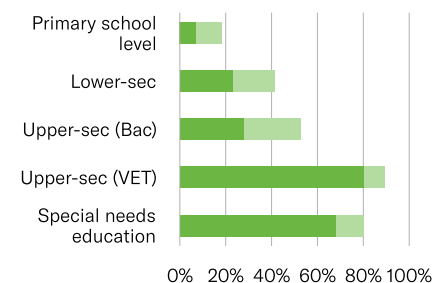
The question is, however, how well students are qualified for such assignments, in particular when they take place right at the start of studies. For students in regular degree programmes, gainful employment with a high teaching workload also entails the risk of not being able to complete their studies within the planned period of study or even of dropping out prematurely. Furthermore, there is a risk that teaching activities outside of studies might suggest that students already possess the necessary teaching skills. This undermines the right to supervised, practical vocational training (*Bacher et al., 2024*).

As part of the move towards making forms of study more flexible, most higher education institutions offer part-time courses of study that enable students with family and financial obligations to pursue reduced employment or care responsibilities in addition to their studies (*Hirsch et al., 2024*). However, the option of part-time study is by no means used by all students in employment (→ Figure 312). On average, only about half of the students who have a workload of at least 50% are enrolled in a part-time programme. There are major differences both between the degree programmes as well as between the higher education institutions. It can be assumed that the framework conditions differ from one university to another and that students succeed, to varying degrees, in completing a regular degree programme successfully in addition to a high level of teaching commitment. In addition, the cantons or schools in the individual cantons deal differently with the question of how students may be recruited as teaching staff and with what maximum workload.

311 Employment while studying

Regular gainful employment related to studies (entire bar); at least 50% of which (dark green); 2017–2023

Data: FSO (EHA); calculations: SCCRE

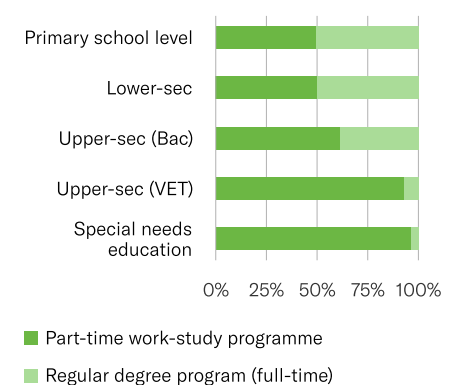


VET = vocational education and training

312 Study form of gainfully employed students

Type of study of students who are regularly at least 50% in gainful employment and related to their studies; 2017–2023

Data: FSO (EHA); calculations: SCCRE



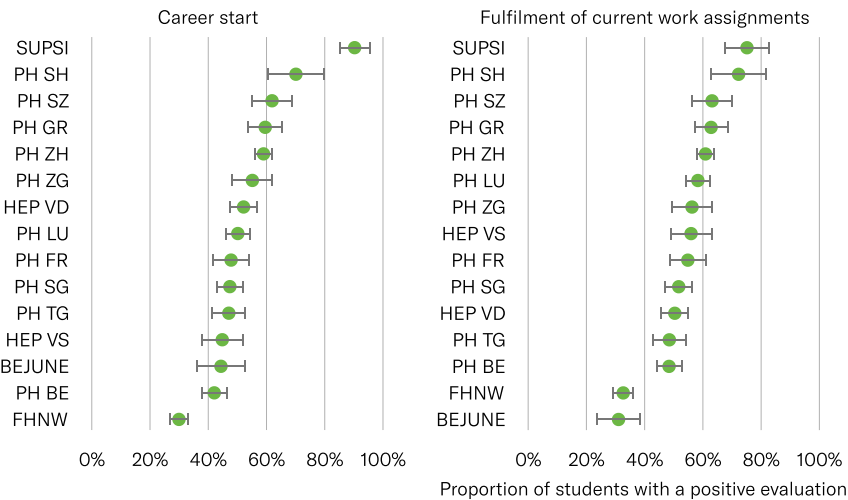
Assessment of the training by the students

Based on the survey of university graduates (EHA), it can be determined how well graduates of the universities of teacher education feel their education is prepared for practising the profession. Although this type of assessment of training is based on a subjective assessment by the students, it can provide important information on the effectiveness of the training (→ Figure 313).

313 Assessment of the professional relevance of the training by the graduates

Data: FSO (EHA 2017–2023); calculations: SCCRE

Share of graduates (including 95% confidence interval) who indicate that their studies provide a good or very good basis for starting a career and completing their current work duties. Only graduates of the primary school degree programme who are gainfully employed in compulsory education one year after completion of their studies.



A nationwide comparison reveals substantial differences. In addition to a broad midfield, in which around half assess the training positively, higher education institutions with approval rates of over 60% also exist, as well as those with very low scores. Although the assessments are made retrospectively, they are conducted within the context of the specific job. Systematic differences by subject or occupational group are minimised by only taking into account graduates from the primary school level degree programme for this comparison. However, individual characteristics such as gender, age, entry requirements, previous education and similar are not taken into account here. These are factors that are also likely to influence the students’ judgement.

Job satisfaction

Similar to the assessment of training, job satisfaction also depends on a variety of influencing factors. These include individual characteristics (cognitive and non-cognitive abilities) such as institutional characteristics (for example, school management or teamwork) or structural characteristics (pupil characteristics, class size, earnings).

If it is assumed that it is the task of the universities of teacher education to clarify and determine professional aptitude during training, there should

actually be a basic fit when starting a career. Due to the pronounced occupational field reference in teacher education compared to other types of higher education institution, it would be expected that job satisfaction among graduates of universities of teacher education would be higher than among those of universities, for example. Based on the graduate data, it can be shown that graduates of the universities of teacher education actually have very high satisfaction scores with regard to the content-related aspects of their professional tasks as well as their income. With regard to their perceived workload, they are significantly less satisfied than graduates from other types of higher education institutions (→ Figure 314). This finding would have to be taken into account when discussing the effectiveness of training if it were to become apparent that graduates from universities of teacher education report having difficulty dealing with the workload in their profession significantly more often than persons with a diploma from a different type of higher education institution.

Career start

From the perspective of the education system, career entry and retention of trained teaching staff represent an effectiveness criterion. If a significant proportion of the graduates of the universities of teacher education decide against teaching or give up a teaching activity soon after they have begun, this would indicate inadequate professional preparation – provided that the professional appeal remained unchanged – which is decisive for assessing the performance of the universities of teacher education. Personal attitudes and motivational beliefs are also key when starting a career (Keller-Schneider, 2023; Schneider, 2021; Freisler-Mühlemann et al., 2021). If persons who work in the profession see themselves as competent and if they attribute this acquisition of skills to the training, then these would be indications of a high level of efficiency in higher education. The vast majority of graduates of universities of teacher education start teaching within one year of completing their studies, but with considerable differences between the educational levels. 83% of teachers with a training for primary school level teach appropriate to their level, compared to around 74% of trained lower-secondary level teachers and a good 55% of upper-secondary level teachers (→ Figure 315). The substantial proportion of teachers in lower-secondary and upper-secondary education who teach at a different level could be an indication of difficulties when starting a career, or – particularly in the case of baccalaureate school teachers – of the flexibility of being able to pursue other professions.

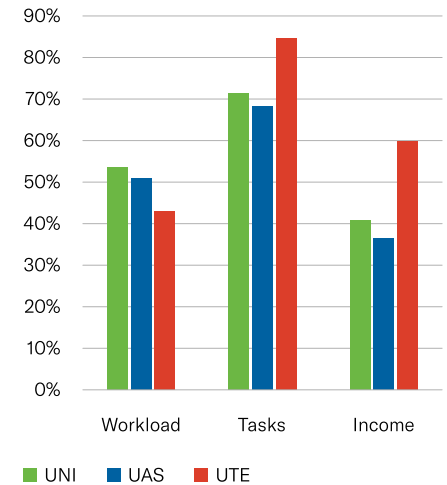
Efficiency/costs

Statements about the efficiency of resources used in UTEs demand both comparable data on the various inputs (real and monetary) as well as suitable output measurements. Because there is no generally applicable measure of output for the area of teacher education, it is not possible to make general statements about the efficiency of education. The following remarks are therefore limited to a comparison of the monetary inputs (costs).

314 Job satisfaction by higher education institution type

UTE: Gainful employment only as a teacher

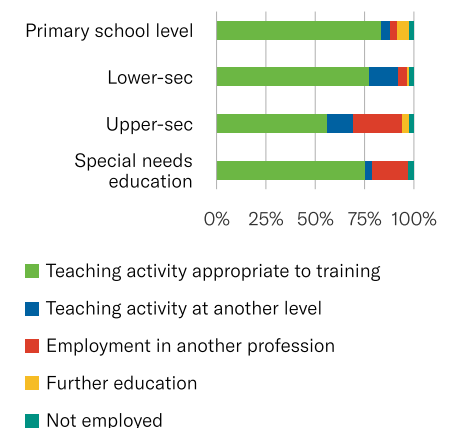
Data: FSO (EHA: Initial survey 2021, 2023); calculations: SCCRE



315 Employment situation of graduates by degree programme

Employment situation of UTE graduates 1 year after completion

Data: FSO (EHA: Initial survey 2023); calculations: SCCRE



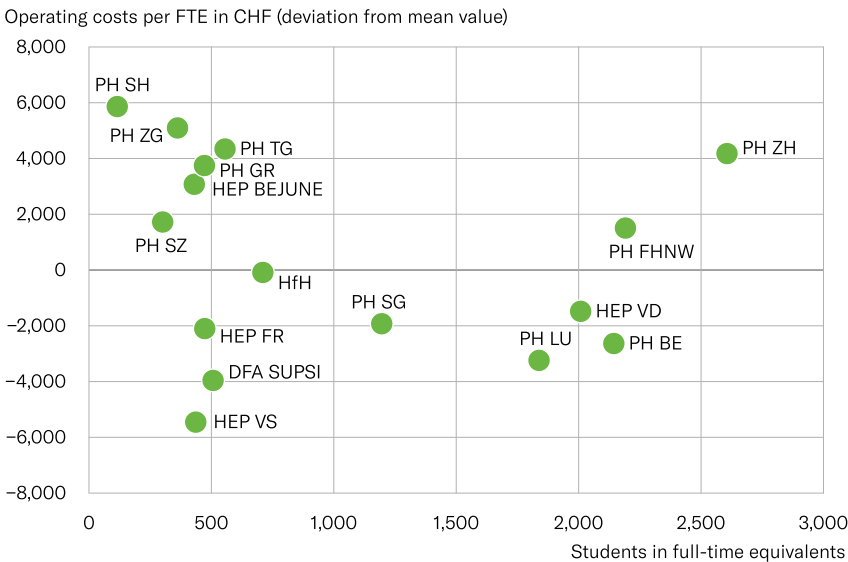
Training costs per person

A comparison of the training costs per person for the primary school level degree programme between the individual universities of teacher education (measured in full-time equivalents [FTE]) reveals major differences (→ Figure 316). However, this cost heterogeneity cannot be explained by the size of the higher education institutions. Possible explanations could be provided by the different student-teacher ratios, differences in training models and study offerings, diverging wage costs, unequal personnel structures and the generally different organisational structures of the higher education institutions. However, a detailed analysis of the factors influencing the cost differences is not yet available.

316 Costs of education per student and number of students by university, 2023

Personnel costs for basic education per student in FTEs at UTEs under public law; deviation from mean value

Data: FSO; calculations: SCCRE

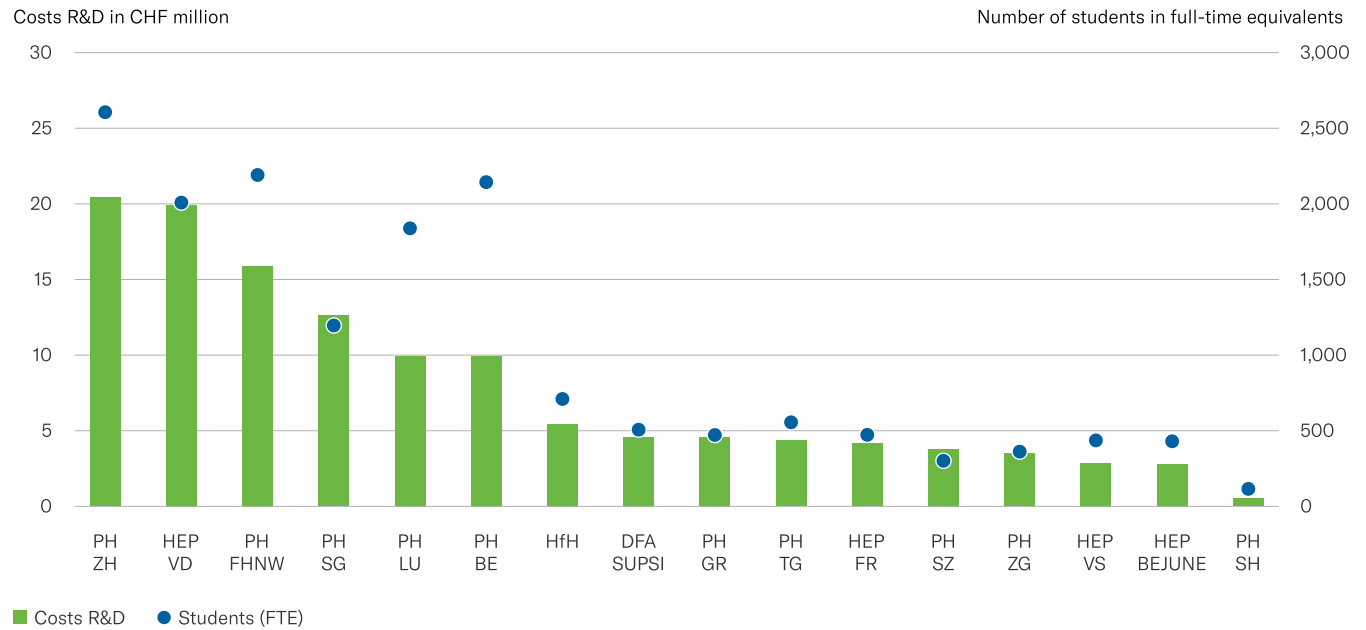


Although the costs of research and development (R&D) depend on the size of the higher education institution (→ Figure 317), the expenditure for this also varies considerably amongst higher education institutions of the same size. More important, however, is the fact that there is probably a critical size, below which it is not possible for an individual higher education institution to establish effective and efficient research production. For small higher education institutions, this raises the question of how they want to fulfil their performance mandate in research and development without having to invest a disproportionate amount of resources in this area.

317 Costs for research and development by higher education institution, 2023

Operating costs for R&D and students in FTEs (right scale)

Data: FSO

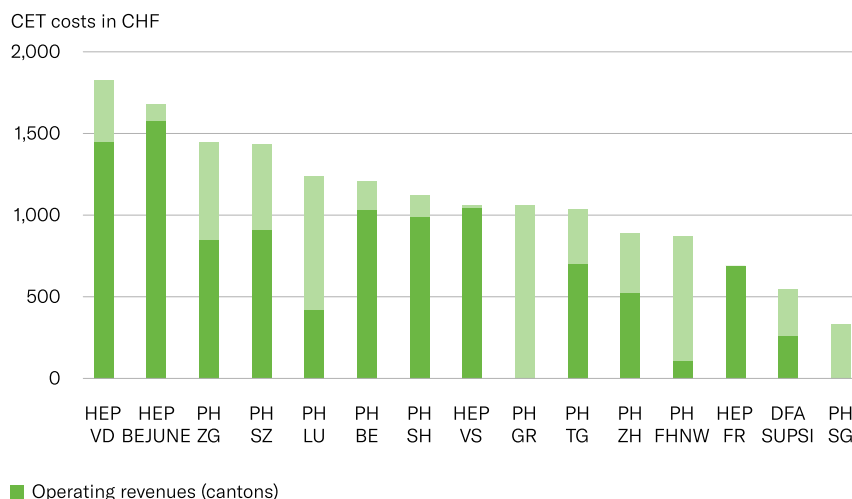
**CET costs**

The performance mandate of the universities of teacher education also includes the continuing education and training of teachers. As a rule, universities of teacher education are responsible for the continuing education and training of the school staff in their sponsoring cantons. How these training courses are implemented and the amount of resources spent on them varies. The following graphic illustrates the amount that the sponsoring cantons allocate on average per teacher for continuing education and training. To this end, the costs of continuing education and training at the higher education institutions were set in relation to the number of teaching staff in their supporting region (→ Figure 318).

318 Continuing education costs and operating revenue by cantons per teacher, 2023

Continuing education and training costs and operating revenue from cantons (dark green), relative to the number of teachers (compulsory school) in the supporting region

Data: FSO; calculations: SCCRE



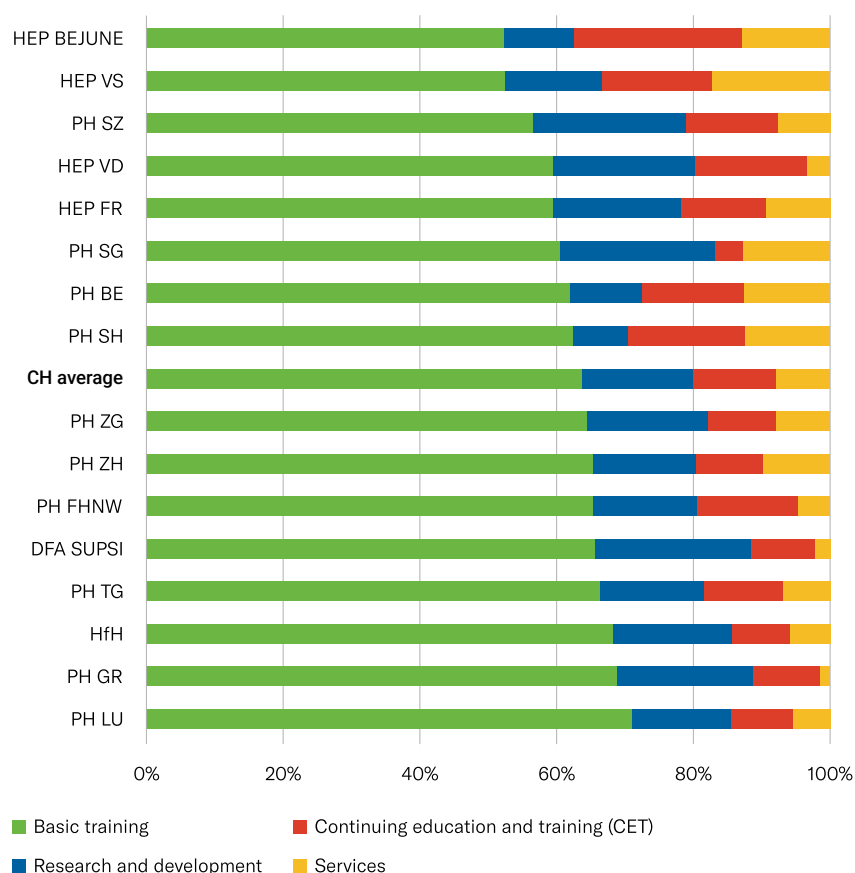
The dark green columns indicate the operating revenue per teacher in the continuing education and training programme that the universities of teacher education receive from the cantons (operating revenue from the sponsoring cantons). These amounts correspond to the services charged in the area of continuing education and training which the cantons have commissioned from the universities of teacher education. Here, too, there are considerable differences between the individual higher education institutions. As can be seen in the graphic, not all cantons receive services from their higher education institutions to the same extent; in addition, further education and training are paid for by teachers on a private basis. And finally, in the case of higher education institutions that do not report any cantonal revenue for continuing education and training, the question arises as to whether the cost centres are recorded in a standardised manner.

Personnel costs

If personnel costs are differentiated according to the four service areas, no correlation with the size of the higher education institution can be observed either. The different cost structures cannot therefore be explained by the size of a higher education institution, as there are small (Schaffhausen) and large (Zurich) universities of teacher education with a proportionately large allocation of resources in the area of education. In the third-party funded area (continuing education and training, research and development, services), the various higher education institutions also have different profiles. It must, however, be taken into consideration, that even small increases in staff, for example, in the area of research and development, can have a strong impact on the overall ratio at small higher education institutions due to the pro rata consideration (→ Figure 319).

319 Staff costs by performance type and higher education institution, 2023

Data: FSO; calculations: SCCRE



Financial sources of the universities of teacher education

The universities of teacher education are primarily financed by fixed contributions from their sponsors (cantons). In addition, there are contributions from other cantons as part of the Intercantonal Agreement on Universities of Applied Sciences (FHV)⁶, tuition fees, third-party funds and other income. The combination of the various financial sources is different according to the area of performance. However, the earnings structure of all higher education institutions over all areas of performance is examined below (→ Figure 320).

The increase in students from outside the canton has an impact on the financial resources of the host higher education institutions. On average, the higher education institutions receive 15% of their operating costs in the form of intercantonal compensation payments. Basic financing by the sponsors (incl. FHV internal) is on average just under 70%. The less that a university of teacher education is able to acquire students from outside their canton and thus FHV agreement contributions as well as third-party funding, the greater the share of financing which the sponsoring canton needs to provide.

6 Intercantonal University of Applied Sciences Agreement of 12 June 2003.

External funding has a direct impact on funding by the sponsoring cantons. If these cover expenses that would have been incurred without their use, the sponsoring cantons' share of costs is reduced both in absolute and in percentage terms. If, on the other hand, third-party funding enables additional activities that would not have been possible without it, the sponsoring cantons' share of costs is reduced only in percentage terms, but not in absolute terms. The amount of the sponsor contribution varies – dependent on these factors – very widely between the universities of teacher education; it ranges from less than 50% in the case of the Lucerne University of Teacher Education to over 80% in the case of the BEJUNE University of Teacher Education (→ Figure 320).

320 Operating revenues by financial source in percentage of the operating costs, 2023

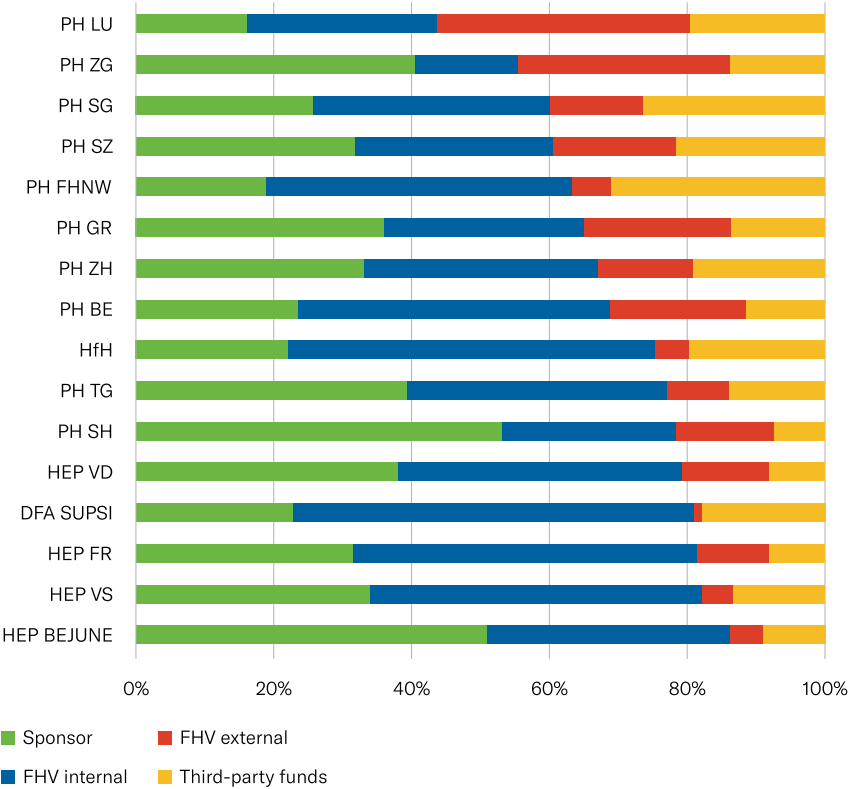
Data: FSO; calculations: SCCRE

Residual financing sponsors
Excluding infrastructure costs

FHV internal
Contributions within the framework of the FHV for students within the supporting region (calculative)

FHV external
Contributions within the framework of the FHV for students outside the supporting region

Third-party funds
Research funds, tuition fees, other revenues



Equity

In addition to the analysis of the higher education system (→ *chapter Tertiary-level education, page 189*), this chapter primarily discusses equal opportunities at the universities of teacher education from the perspective of access to education, in addition to the analysis of the higher education system. Disparities between different social groups, genders as well as between students who are Swiss nationals and those who are foreign nationals are highlighted.

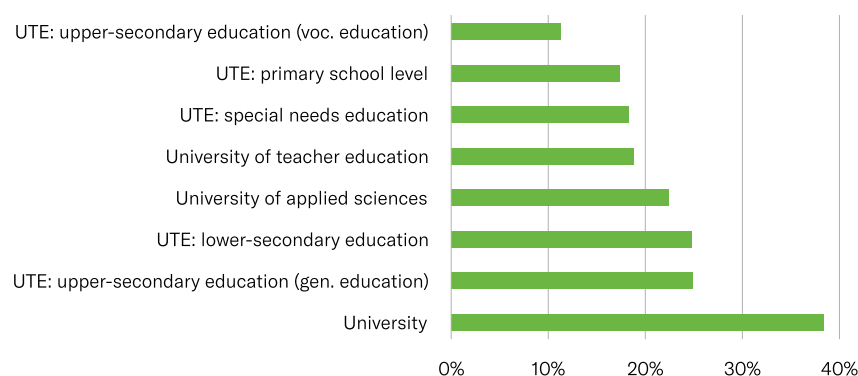
Social background

The social disparity observed in the Swiss higher education system between the university and non-university sectors (Leemann *et al.*, 2022; Denzler, 2011; Diem, 2021) can also be seen in the various study programmes at the universities of teacher education. However, with an admission practice that offers more alternative access for persons without a university admission qualification in comparison with universities, the latter contribute to improving equal opportunities in access to higher education. Thus the share of persons who graduate from the programme of study of primary school level at universities of teacher education and whose father has a degree from a higher education institution is around half that of university graduates. The proportion of students whose father has a university degree then increases in the degree programmes for lower-secondary education and for prospective secondary school teachers (→ Figure 321) in parallel with the share of students who have an academic baccalaureate. It is lowest amongst teachers in the vocational part of upper-secondary education. Prospective teachers are therefore more diverse in terms of their educational backgrounds than typical university students and thus more closely reflect the educational backgrounds of their future pupils. For the compulsory school level, the teaching staff correspond with regard to their social origin rather to the social average of the population than the average of holders of a degree at university level. An interesting observation is that the prospective secondary school teachers also come considerably less frequently from academic families than the average of the other graduates from universities, who were their fellow students during their specialised studies at university.

321 Social origin of university graduates by degree programme, 2023

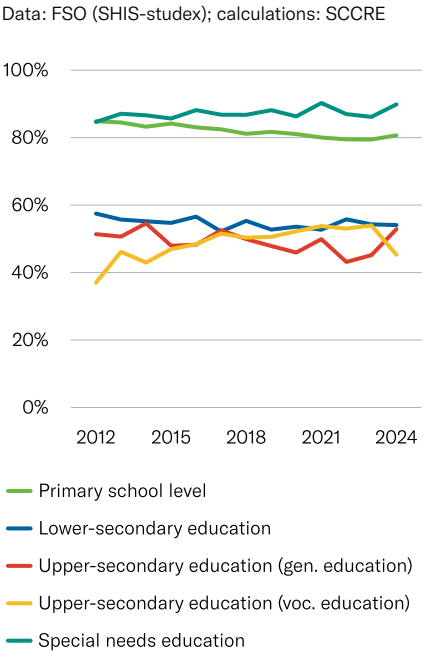
Share of graduates whose fathers hold a university degree (UNI, UAS, UTE)

Data: FSO (EHA: initial survey 2023); calculations: SCCRE



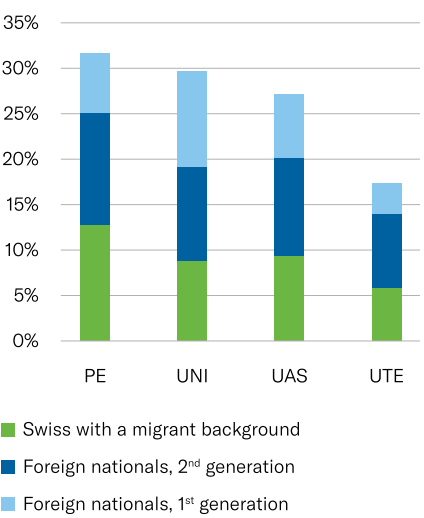
322
Share of women by degree programme, 2012–2024

Development of the share of women in the persons entering a UTE, by degree programme
Primary school level: Admissions to the Bachelor's degree programme; lower-secondary level: Admissions to the Bachelor's degree programme, except for BEJUNE, SUPSI and HEP VS, where admission to the Master's degree programme takes place; upper-secondary level: Admissions to the diploma programme; special needs education: Admissions to the Master's degree programme



323
Students by migration background and tertiary education

University admission 2020 or later
Data: FSO (LABB); calculations: SCCRE



Gender

The study programmes of the universities of teacher education are traditionally characterised by a high proportion of women, which decreases from one education level to another for which the prospective teachers are trained. The Special Needs Education degree programme currently has the highest share of women at 90%. The degree programmes for upper-secondary education comprise the least number of women (→ Figure 322).

However, it can be stated that the share of men in the degree programmes for the compulsory educational level has risen slightly over the last ten years. The extent to which this increase is related to developments in admissions practice still needs to be investigated in more detail.

Migration status

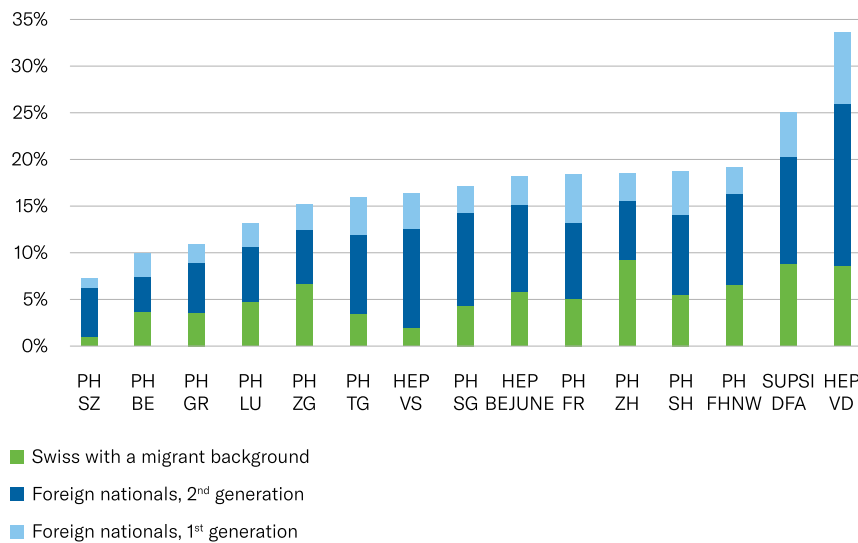
In contrast to the educational background of students at universities of teacher education, the share of teachers with a migration background is significantly lower than that of the pupil population. Altogether, only around 5% of students at universities of teacher education who have acquired their university qualification entrance in Switzerland have foreign nationality (known as Swiss-educated foreign nationals). This share is lower than for the other types of higher education institution, although it should also be borne in mind here that, when considering nationality, the share of students with a migration background is underestimated due to naturalisations prior to studies. Taking their first language into account, around 5% of students with Swiss nationality at universities of teacher education can be identified as having a migration background. Together with the foreign nationals who come to Switzerland for their training, this results in a share of students with a migration background of 17% for the universities of teacher education (→ Figure 323). In comparison, the student population at the other types of higher education institutions and in professional education is much more heterogeneous in terms of migration background. However, there are major differences between the universities of teacher education: While less than 10% of students at the Schwyz University of Teacher Education have a migration background, the figure is 20% at the FHNW University of Teacher Education and more than 30% in Lausanne (→ Figure 324).

So far, no satisfactory explanation exists as to why the share of students with a migration background amongst prospective teachers is so low, despite the pronounced shortage of teachers (*Beck et al., 2023*). Analyses of the LABB data provide indications of lower study success rates among students with migrant backgrounds (→ Figure 310). By contrast, a study based on German data finds no evidence of disadvantage among students in teacher education with migration backgrounds (*Besa & Vietgen, 2017*).

324 Students with a migration background by university of teacher education

University admission 2020 or later

Data: FSO (LABB); calculations: SCCRE



Swiss nationals with a migration background:
Persons of Swiss nationality whose first language did not correspond to a national language.

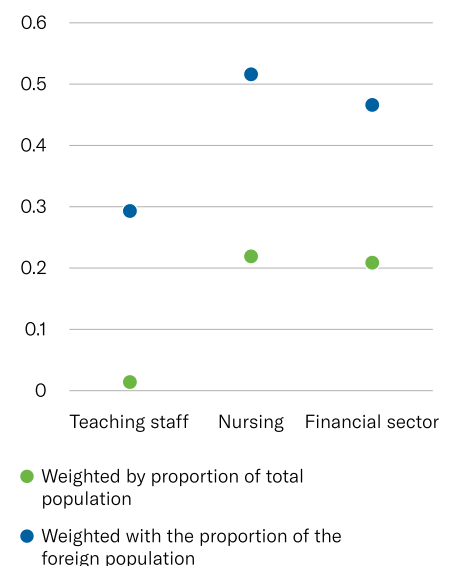
Cultural diversity

The Swiss population and thus the population of pupils are characterised not only by different nationalities or differences in educational background, but also by a high level of cultural diversity (→ *chapter Compulsory education, page 33*). With this in mind, it could be potentially problematic if a culturally very homogeneous teaching staff meets culturally very diverse pupil populations. Various studies show that dealing with a culturally very heterogeneous school is difficult. A more culturally diverse teaching staff could therefore be key to better exploiting the performance potential of pupils with a wide cultural distance from the local population (*Syring et al., 2019*). Approximating the cultural diversity of teachers using data from the Global Preferences Survey (*Falk et al., 2018*) reveals significantly less diversity than in other professional groups (→ Figure 325). This is very low not only because more foreign nationality employees are working in other occupational groups, but also because the majority of teachers with foreign nationality come from countries that are culturally very close to the native Swiss population.

325 Cultural distance between different professional groups

An index is created for each nationality (based on characteristics such as patience, risk-taking, reciprocity, altruism and trust). The deviation from the value for Switzerland represents a measure of the "cultural distance", which is weighted with the proportion of the foreign population.

Data: Universität Bonn (GPS), FSO (SLFS); calculations: SCCRE



Reading example

The mean value of the cultural distance of teachers of foreign nationality is 0.29, which is roughly equivalent to the cultural distance from Sweden. In the occupational fields of nursing and finance, the share of foreign workers is significantly higher; in addition, their cultural diversity is greater than amongst teachers. At a value of 0.5, the mean cultural distance in these two occupational groups is more than one and a half times higher than among teachers. In comparison, the cultural distance from a country such as Albania is 0.8.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

CONTINUING EDUCATION
AND TRAINING

PROFESSIONAL EDUCATION

Context and Overview

Professional education (PE) is offered at the tertiary level alongside education at universities, universities of applied sciences (UAS) and universities of teacher education (UTE) and enables experienced professionals with a Federal VET diploma to access tertiary education without a (vocational) baccalaureate. It also provides a source of experienced professional and managerial personnel for business. The aim of professional education is “to enable the transfer and acquisition of competences needed to carry out the complex tasks and decision-making associated with a given profession” (Art. 26 para. 1 VPETA)¹. Compared to other tertiary-level qualifications, professional education is more closely aligned with the requirements of the labour market. Students in professional education tend to complete their education on a part-time basis and more often have several years of professional experience (professional education institutions: 5 years on average; Federal Professional Examination: 10 years on average; Advanced Federal Professional Examination: 11 years on average) (FSO, 2024h).

326 Overview of professional education in Switzerland

Data: SCCRE

Admission requirements		Duration	Provider	Qualification	NQF VET
Federal exams	Federal Professional Examination (FPE) Upper-secondary qualification and a certain number of years' work experience in the relevant field	not specified; attendance of preparatory courses (work-study) is voluntary; duration of preparatory courses on average 2 (FPE) or 2.5 (AFPE) years	freely selectable preparatory courses offered by the professional organisations, public or private schools	Federal Diploma of Higher Education (FDHE), e.g. Specialist in Business Administration and Applied Technical Management, FDHE; HR Specialist, FDHE; Chartered Specialist in Accounting and Financial Management, FDHE	5–6
	Advanced Federal Professional Examination (AFPE, also master examination) Federal Professional Examination and a specific number of years' work experience in the relevant field			Advanced Federal Diploma of Higher Education (AFDHE), e.g. Registered Nurse, AFDHE; AFDHE in Business Administration; Social Worker, AFDHE	6–8
Professional education institutions (PEI) Upper-secondary qualification and work experience in some cases		4–8 semesters ² (full-time or part-time)	Private and public schools	Advanced Federal Diploma of Higher Education (AFDHE), e.g. Nurse AFDHE; Business economist AFDHE; Social education worker AFDHE	6

NQF National Qualifications Framework

1 Federal Act on Vocational and Professional Education and Training (VPETA) of 13 December 2002.
2 In the case of a federal VET diploma in a relevant field, students undertake 3,600 teaching hours, corresponding to 4 (full-time) or 6 (part-time) semesters. In the case of another upper-secondary qualification, students undertake 5,400 teaching hours, corresponding to 6 (full-time) or 8 (part-time) semesters.

The Federal Professional Examinations (FPE) and the Advanced Federal Professional Examinations (AFPE) confirm the candidates' professional skills and enable them to conduct activities at a level that requires more than a completed vocational education and training (VET diploma). The Advanced Federal Professional Examinations set higher demands within an industry sector than the Federal Professional Examinations. They qualify graduates to work as managers or experts in a specific field. In the case of the Federal Professional and Advanced Federal Professional Examinations, the professional organisations define the skills to be acquired in the examination regulations and verify them in the centrally conducted examinations. Graduates receive a Federal Diploma of Higher Education (FDHE) or an Advanced Federal Diploma of Higher Education (AFDHE). Exam preparation, however, is not regulated.

Broad, generalist professional education institutions (PEI) provide students with practice-oriented skills for taking on professional and management responsibility. The professional organisations work with the education providers to develop the framework curricula for the professional education institution qualifications, which define the admission requirements, the titles, the occupational profiles and skills, the types of courses offered and the qualification procedure. Based on the core curricula, training providers can have their courses of study recognised at federal level. They conduct the final qualification procedures and issue the diplomas.

Development of qualifications

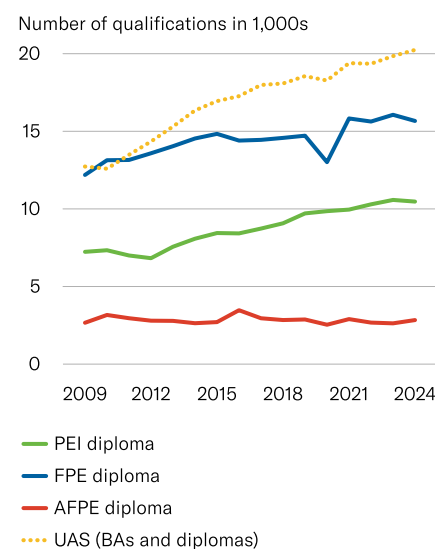
Annually, 25,000 to 30,000 professional education qualifications are awarded, which corresponds to around 45% of all first qualifications at tertiary level³. However, the number of qualifications is significantly higher than that of persons with a professional education qualification as their highest level of education. This is due to the fact that some people acquire several qualifications at this level; in addition, persons with other educational achievements at tertiary level also obtain a professional education qualification.

In the period 2014–2024, the number of qualifications at professional education institutions increased by 3% per year (→ Figure 327), while the number of qualifications with federal examinations remained relatively stable (Federal Professional Examination +0.8%; Advanced Federal Professional Examination +0.8% per year). As a result, the number of qualifications from professional educational institutions increased more strongly in this period than those from universities of applied sciences (+2.4% per year). In 2020, a number of Federal Professional Examinations and Advanced Federal Professional Examinations were postponed due to the COVID-19 pandemic. This led to a decline in Federal Professional Examination qualifications. There was a compensation effect in the following year; nevertheless, around 2,000 fewer FPE diplomas were issued in these two years than would have been expected in a linear development. Growth has been in line with pre-pandemic trends again since 2022.

For 2023, the Federal Statistical Office (FSO) presented scenarios for the federal examinations for the first time, and not just for the professional education institutions. The forecasts are based primarily on the expected

327 Development of qualifications by training type, 2009–2024

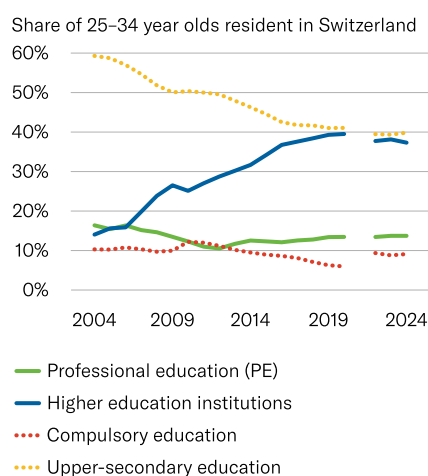
Data: FSO



³ Bachelor's level and licentiate, diplomas from universities, UASs and UTEs.

328 Development of the highest educational qualification of the 25–34-year-old population

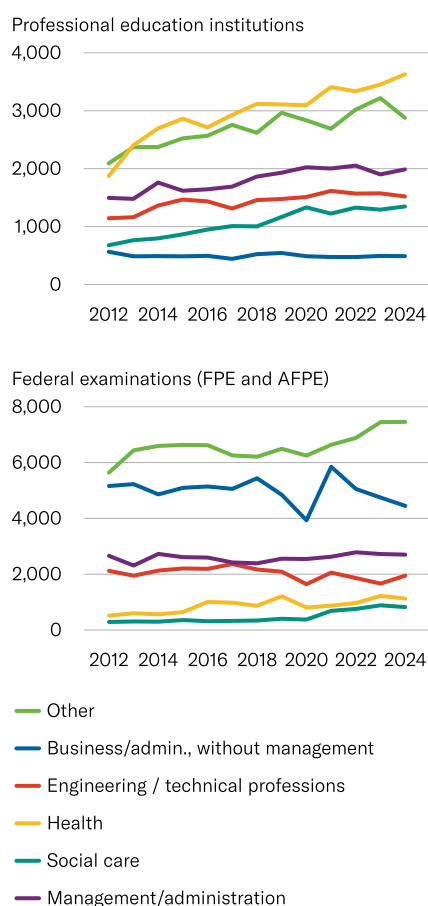
Data: FSO



In 2021, there is a break in the time series due to an adjustment of the survey method; for this reason, the corresponding data has not been published.

329 Qualifications by field of education

Data: FSO



demographic development, young people's interest in a VET diploma and on the transition rates to professional education. According to the reference scenario, the FSO expects annual growth to slow to 0.7% for professional education as a whole (professional education institutions +1%; Federal Professional Examination +0.2%, Advanced Federal Professional Examination +1%; universities of applied sciences +0.8% per year).

The rapid expansion of education since the turn of the millennium has meant that every second person between the ages of 25 and 34 now has a tertiary-level education achievement (→ *chapter Tertiary-level education, page 189*). In particular, the share of persons with a higher education degree has increased, while the share of persons with a professional education qualification has remained constant (→ Figure 328). This shows that, although professional education benefited less strongly from the expansion of education, this did not come at the expense of professional education. Rather, the expansion reduced the number of persons without a tertiary qualification. The share of 25–34-year-olds with the highest educational achievement in professional education fell to just over 10% of all tertiary qualifications between 2006 and 2012 as part of the expansion of universities of applied sciences, but rose again to around 14% in the following years (2021).

An examination of the development in the individual fields of study (→ Figure 329) shows that amongst the professional education institutions, there was a strong annual increase in the number of qualifications in health (+3.5%) and social work (+6.9%), while the increase was somewhat lower in engineering and technical professions (+1.2%) as well as management and administration (+1.3%). By contrast, the qualifications in business and administration (excluding management) completed stagnated. In terms of federal examinations, growth was even more pronounced in the areas of health (+10.1%) and social work (+17.6%), although it started from a lower level. In the other fields of study, the number of qualifications remained largely constant, with the exception of the fluctuations in business and administration caused by the COVID-19 pandemic.

Digitisation

Digitisation also has an impact on professional education in a number of ways and is seen as a major challenge by stakeholders at the professional education institutions (*Neukomm et al., 2020*). However, professional education is well positioned to respond to this change promptly and flexibly, for example through the rapid creation of new professions such as cyber security specialists or e-commerce specialists (*Pusterla et al., 2023*). On the other hand, changing needs also mean that existing core curricula and examination regulations need to be adapted to meet the high labour market and practical orientation of professional education (*Bach et al., 2022*).

Digital skills influence the production process of companies and lead to higher added value. Information technology skills are particularly effective for those with a professional education qualification, while those with a university degree are more likely to benefit from communication technologies (*Bolli & Pusterla, 2023b*). Employees also benefit from digitisation, as it leads to higher job satisfaction by increasing productivity and making work more interesting. Although digitisation also results in greater time pressure and

a poorer work-life balance, surveys indicate that overall the positive effects seem to outweigh (Bolli & Pusterla, 2022).

Digitisation also influences the learning processes during training. Digital tools such as learning management systems, digital learning materials and interactive tools are used more frequently today. Digitised teaching formats such as blended learning and hybrid forms of teaching are also being deployed more frequently. The digitisation strategies of the professional education institutions differ significantly: They depend on the competitive pressure of the school and on the question of the extent to which the respective field of study is exposed to digital change. Another important factor are the lecturers, who are sometimes critical of digitisation – mainly as a result of didactic and pedagogical concerns (Hänni et al., 2023). Although they are experts in their field, studies show that they do not always have (media) didactic knowledge, which renders the development of skills a major challenge (Getto, 2022).

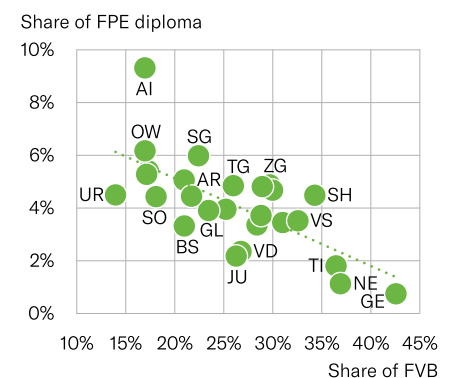
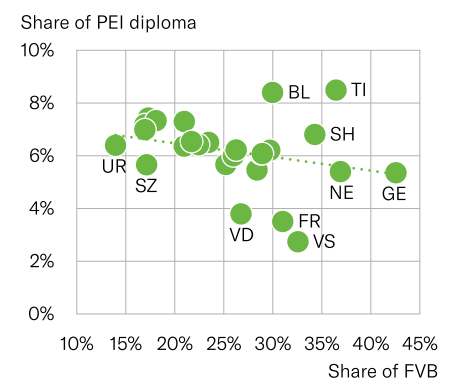
Relationship with universities of applied sciences and continuing education and training CET

Given the comparatively weaker growth of professional education during the educational expansion, it is assumed that the growth of higher education institutions has been at least partly at their expense and that higher education institutions are thus competing with professional education. According to a survey on the positioning of professional education institutions among professional organisations, education providers and cantons, the competition with the universities of applied sciences is indeed described as the greatest challenge in the context of education (Neukomm et al., 2020). This relates less to consecutive Bachelor's and Master's degree programmes than to continuing and executive education programmes. CAS, DAS and MAS qualifications are perceived by 45% of the professional organisations surveyed and 47% of the education providers surveyed as competitors to the professional education institutions (Ecoplan, 2022). The Federal Professional Examinations (61%) and the Advanced Federal Professional Examinations (71%) are most likely to be in such a competitive situation.

However, it is difficult to determine whether and to what extent the various tertiary-level education systems actually compete with each other. Indirectly, a potential competitive situation can be seen by observing the proportion of cantonal vocational baccalaureates. Assuming that, in principle, a similar number of people would aspire to a tertiary-level qualification in all cantons,⁴ it would be expected that, in the event of strong competition between professional education and universities of applied sciences, more people would complete professional education in cantons with a low federal vocational baccalaureate rate, as a smaller proportion has been admitted to a university of applied sciences. Figure 330 shows that this correlation actually exists. For example, the probability of graduating from a professional education institution is higher in cantons with a low federal vocational baccalaureate rate. However, the correlation is weak. On the other hand, competition

330 Cantonal share of PE qualifications and share of FVB

Data: FSO (LABB); calculations: SCCRE

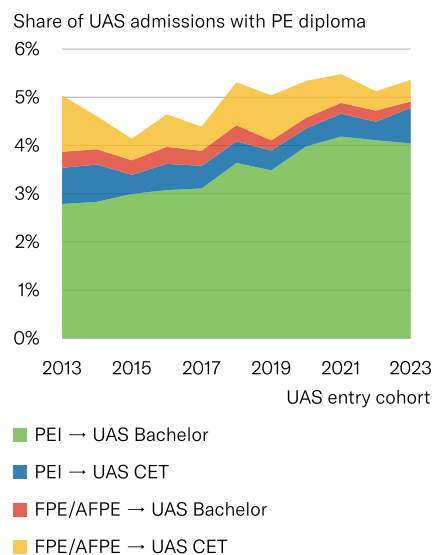


The population includes all persons who completed vocational education and training (VET) between 2015 and 2018. The figures show the shares, adjusted for personal characteristics, of persons who completed a PE graduation within five years of this graduation.

⁴ In fact, a significant share of the cantonal differences in federal vocational baccalaureate rates can be attributed to institutional factors such as admission to the federal vocational baccalaureate, and not primarily to different preferences amongst young people for a tertiary-level qualification (Hänni et al., 2022).

331 Transfers from PE to universities of applied sciences

Data: FSO (LABB); calculations: SCCRE



Reading example

Of those who entered a UAS in 2023, 4% have a diploma from a PEI and 0.13% have a diploma from a federal examination.

between universities of applied sciences and Federal Professional Examinations is more pronounced (→ Figure 330, below). Persons with a federal vocational baccalaureate are therefore more likely to prefer studies at a university of applied sciences to a Federal Professional Examination, while they are less likely to decide against education at a professional education institution.

The permeability between professional education and the universities of applied sciences is also often criticised. Swissuniversities recommends exam-free admission for graduates of professional education institutions with a profession related to the field of study, an entrance examination for persons holding a Federal Professional Examination and proof of skills in the field of general education for persons holding an Advanced Federal Professional Examination. However, only 5% of the cohorts entering universities of applied sciences are admitted through professional education. Persons with a qualification from a professional education institution transfer to a university of applied sciences much more frequently than persons with a Federal Professional Examination or Advanced Federal Professional Examination (→ Figure 331). Half of these professional education graduates start a Bachelor's degree at a university of applied sciences in the fields of business administration, nursing and industrial engineering. More than three-quarters of those who start continuing education and training at a university of applied sciences opt for business and services. Professional education institutions and universities of applied sciences therefore tend to rarely be complementary courses of study from an individual perspective. This may be due to the fact that, on the one hand, the admission requirements are very different, but on the other hand, the labour market prospects following a qualification of professional education are so good that further studies at the level of a university of applied sciences are rarely advisable.

Institutions

Institutional developments

Various reforms have already been implemented as part of the strategy project "Strengthening professional education". These include the subject funding of preparatory courses for the federal examinations, the placements in the National Qualifications Framework (NQF), the Intercantonal Agreement on Funding Contributions for Study Programmes at Professional Education Institutions (ICA-PEI) and the Ordinance on the Minimum Requirements for Recognition of Study Programmes and Continuing Education and Training at Professional Education Institutions (MiR-PEI). The follow-up project "Positioning professional education institutions" and other optimisation measures were referred to Parliament in 2025. They include

- the introduction of the term "professional education institution", according to which only providers of a federally recognised course of study at a professional education institution may now call themselves "professional education institution";
- the introduction of the title supplements "Professional Bachelor" for qualifications from the professional education institutions and for the Federal Professional Examination as well as "Professional Master" for

the Advanced Federal Professional Examination in order to promote the visibility, awareness and comprehensibility of the qualifications;

- the introduction of English as a possible examination language at the federal examinations, in addition to the examinations in an official language;
- making post-diploma studies more flexible at a professional education institution (NDS PEI). These will no longer have to undergo a federal recognition procedure in future, but will continue to be subject to the MiR-PEI.

In addition, the optimisation of the current public funding of professional education institutions is being examined. An increase in the cantonal contributions under the ICA-PEI towards the targeted cost recovery of 50% is being discussed.

Provider structure

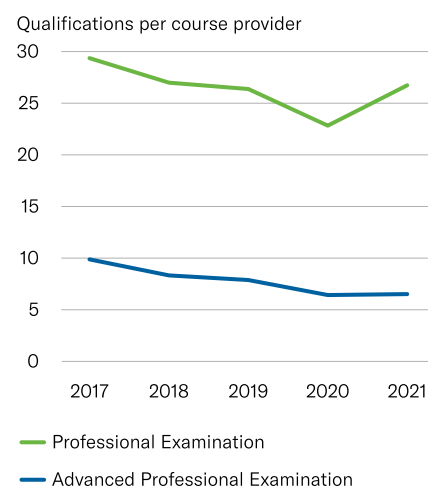
Compared to higher education institutions, the provider structure in professional education is highly fragmented. On the one hand, this is because training courses and not training institutions are recognised here by the federal government, and, on the other hand, it is the consequence of the proximity of professional education to the labour market. Geographical fragmentation makes sense if it guarantees access to the relevant educational institutions throughout Switzerland while taking regional particularities into account. For many students at a professional educational institution, proximity to their place of residence is an important criterion when choosing an education provider. However, other criteria – in particular a good reputation as well as practical and vocational courses – also influence the choice of provider, with 21% completing a training course outside their canton of residence, even though the training course chosen is also offered in their canton of residence (FSO, 2024q).

As shown by a survey (Ecoplan, 2022), around 40% of professional education institutions offer only one course, while only 11% offer more than five courses. Half of the providers have fewer than a hundred students. This fragmentation is not expected to change much in the future: 58% of professional education institutions are not interested in merging with other providers, or have considered a merge but rejected it again, and a further 22% have already merged with others.

The provider structure is also highly fragmented where the federal examinations and their preparatory courses are concerned. Data regarding this has been available since the introduction of subject-oriented funding, as federal contributions are only paid for courses offered by providers who are entered on the registration list. The number of providers registered here has risen sharply in recent years and now stands at over a thousand. This results in an average number of 25 qualifications per provider for the preparatory courses on the Federal Professional Examinations and their modules and around eight qualifications for the providers of Advanced Federal Professional Examinations (→ Figure 332). However, this is only the number of qualifications per registered provider, while the number of unregistered providers is unknown. The actual number of qualifications per course or module could therefore be even lower.

332 Number of annual graduations per course provider

Data: FSO (2023b); calculations: SCCRE



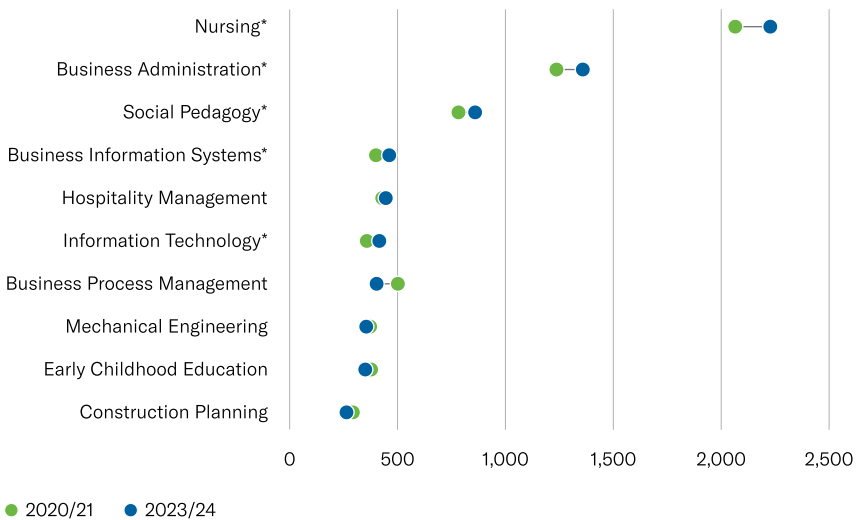
Professional education institutions

The courses of the professional education institutions are based on core curricula developed by the professional organisations in collaboration with education providers and approved by the State Secretariat for Education, Research and Innovation (SERI). The core curricula must be reviewed and re-approved every seven years. Professional education institutions also offer post-diploma courses that have likewise been recognised by the federal government up to now. Qualifications from professional education institutions focus on a few professions: The five most frequently attended training courses (Nursing, Business administration, Social education, Business information technology, Hotel and gastronomy) accounted for more than half of all qualifications in 2024 (→ Figure 333). The five courses that have grown the most over the last three years are also among the most frequently chosen, namely Nursing, Business administration, Social education, Business information technology and Information technology.

The promotion of entry, change and re-entry and the recognition of skills already acquired are among the education policy objectives (EAER & EDK, 2023). Prospective students who do not meet the admission requirements for professional education institutions can also have their skills partially credited, where the individual education providers are permitted a great deal of leeway. A recent report (Salzmann et al., 2022) shows that this crediting is never conducted by half of training providers, rarely by a third and is only common with 1%. Educational achievements are most often credited by persons who have started but not completed a tertiary-level qualification as well as by persons without an upper-secondary-level qualification. In addition, skills can be credited to the training course, which shortens the training time. These types of credits are just as frequent and occur in particular amongst persons with a tertiary qualification or a discontinued tertiary education. Overall, the report identifies the need for action with regard to the crediting practice and makes recommendations.

333 Number of qualifications in the 10 most common and the 5 fastest-growing professions of PEI

Data: FSO



As the number of graduations in the individual courses of study fluctuates considerably from year to year, the average for 2020 and 2021 as well as for 2023 and 2024 is shown.

* The five professions with the greatest growth indicate the courses of study for which the average value increased most sharply in 2023/24 compared to 2020/21.

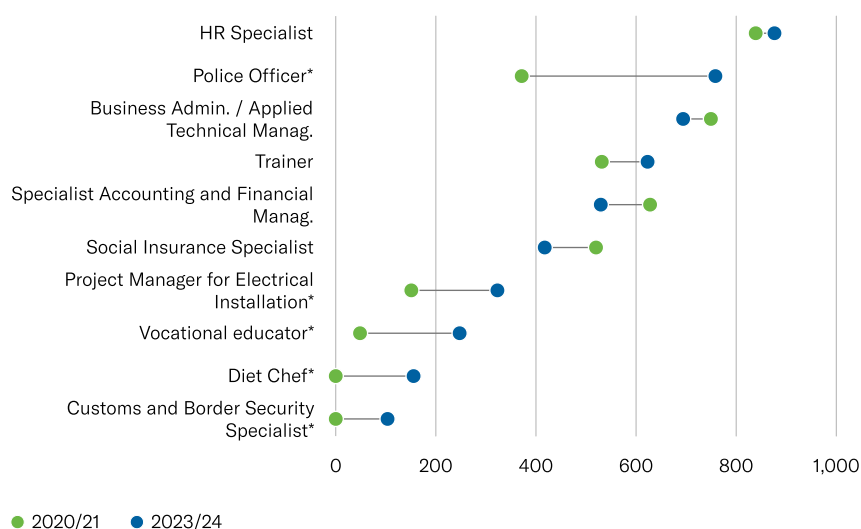
Federal and Advanced Federal Professional Examinations

In contrast to professional education institutions, whose courses are recognised by the federal government, federal recognition of the Federal Professional and Advanced Federal Professional Examinations only refers to the qualification or the examination regulations. The initiative of creating a new Federal Professional or Advanced Federal Professional Examination always comes from a professional organisation. The professional organisations determine the content, i.e. the skills to be assessed in the examination, while the federal government supervises the examinations and approves the examination regulations. As a rule, the responsible professional organisation set the examinations annually or bi-annually. The professional directory of the SERI lists 287 current Federal Professional Examinations and 161 current Advanced Federal Professional Examinations (as of January 2025). There are no regulations governing the preparation for these examinations; candidates are free to choose how they prepare for the examination. However, the overwhelming majority attend a relevant preparatory course. In the 2022 examination cohort, 97% (Federal Professional Examination) and 96% (Advanced Federal Professional Examination) of candidates attended such a course (FSO, 2024h). On average, they spend around 14 hours per week on the preparatory courses.

Qualifications in the Federal Professional Examination are less concentrated than at professional education institutions: The six most common qualifications account for less than a quarter of all qualifications (→ Figure 334). There has been a sharp increase over the last three years, in particular in the number of police officers, employment educators, electrical project managers for installation and security, dieticians and specialists in customs and border security. Both for Federal Professional Examinations and Advanced Federal Professional Examinations it is often the new professions that record the greatest growth.

334 Number of qualifications in the 5 most common and the 5 fastest growing professions in the FPE

Data: FSO



As the number of graduations in the individual courses of study fluctuates considerably from year to year, the average for 2020 and 2021 as well as for 2023 and 2024 is shown.

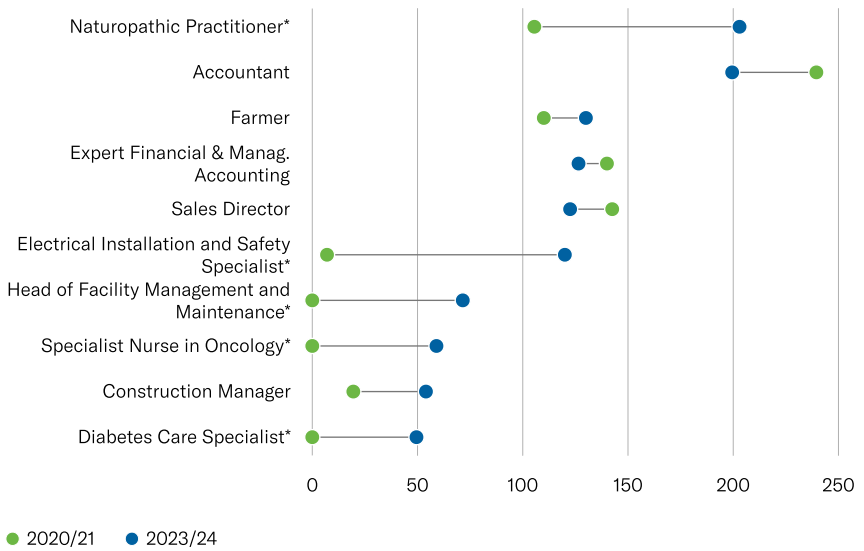
* The five professions with the greatest growth refer to those courses of study for which the average value increased most sharply in 2023/24 compared to 2020/21.

The professional concentration at the Advanced Federal Professional Examinations is similar to that of the Federal Professional Examinations: The five most common professions account for just over a quarter of all qualifications. There has been a sharp increase in the following professions: Electrical installation and safety expert, Naturopath, Head of facility management and maintenance, Specialist in oncology care and Specialist in diabetes counseling (→ Figure 335).

Both for Federal Professional Examinations and Advanced Federal Professional Examinations it is often the new professions that record the greatest growth. However, these can also be initial effects. As the professions have not yet been offered, demand for these training courses is initially high, but settles at a lower level in subsequent years.

335 Number of qualifications in the 6 most common and the 5 fastest growing professions of Advanced Federal Professional Examinations

Data: FSO



As the number of graduations in the individual courses of study fluctuates considerably from year to year, the average for 2020 and 2021 as well as for 2023 and 2024 is shown.

* The five professions with the greatest growth indicate the courses of study for which the average value increased most sharply in 2023/2024 compared to 2020/2021.

Effectiveness

From the point of view of companies, it makes sense to hire employees from different educational backgrounds. Diverse knowledge and practical skills can complement each other and thus increase productivity. However, differences that are too great can also make collaboration more difficult or lead to conflicts and misunderstandings. Particularly productive teams are created when university graduates work together with persons with a vocational education and training qualification and when persons without a post-completion qualification work together with persons with a professional education qualification (Bolli & Pusterla, 2023a).

Discontinuation of studies and examination success

Not all students on a course at a professional education institution complete it successfully. Of those who entered the first year of a corresponding course in 2017, 15% dropped out, 2% are still in education and 1.4% obtained another tertiary qualification. As a result, 81% successfully completed their studies, of which 12 percentage points did so with a delay or interruption (→ Figure 336). The graduation rate is thus similarly high to that of students at universities of applied sciences (81%) and slightly higher than that of students at universities (76%).

As the preparatory courses for the federal examinations are voluntary, it is not known how many persons leave the courses without a qualification. However, based on the survey on professional education (eHBB), it is known how many of the examination candidates are successful. It has been shown that persons with longer previous education (such as a university degree) and younger persons are more successful. There are also significant differences between the various fields of education. However, the type of training has the greatest impact on the probability of success. At the professional education institutions, which organise and grade the examinations themselves, around 95% pass the examination, while around one in five people fail the federal examinations. This difference remains the same even if the above factors are taken into account (→ Figure 337).

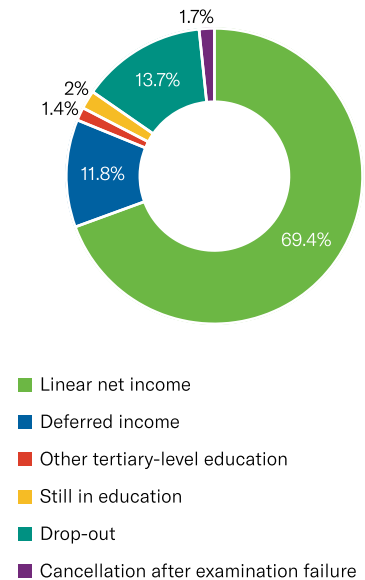
Labour market integration

Graduates of professional education are exceptionally successful in integrating into the labour market. For example, for the 2022 examination cohort, the unemployment rate (as defined by the International Labour Organisation) one year after graduation is 1.8% (professional education institution) or around 0.5% (Federal Professional Examination and Advanced Federal Professional Examination) (FSO, 2025a). These low unemployment rates can also be attributed to the fact that most professional education students were already in employment before their studies. For example, unemployment rates are already below 2% just one year before completing training.

However, a comparison with higher education institutions also shows that persons who have completed professional education are well integrated into the labour market (→ Figure 338). The same cohort was considered for this comparison – all persons who had completed compulsory education in 2012. For all persons in this cohort who completed tertiary-level training, it was examined whether they were unemployed (as defined by the State Secretariat for Economic Affairs) or not in education or employment (NEET) in December of the following year after completing their tertiary-level training. Taking into account individual characteristics – such as lower-secondary level, gender, migration status and canton of residence – there are no significant differences between the education types (→ Figure 338). The exception is a lower NEET rate for persons with a qualification from a university of teacher education. The labour market prospects of professional education graduates therefore seem to be just as good at the start of their careers as those of persons who have completed a different tertiary-level training. This is also shown by studies in which employers evaluate fictitious application

336 Educational paths of PEI students

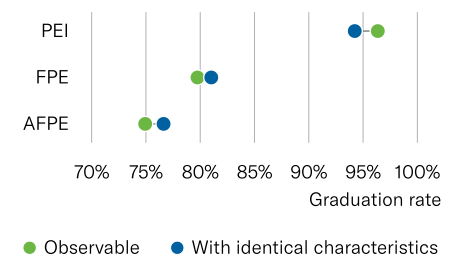
Data FSO (2024e)



The educational paths of persons who entered their first year of study at a PEI in 2017 are shown. The years up to 2022 have been taken into account.

337 Examination graduation rates by type of PE

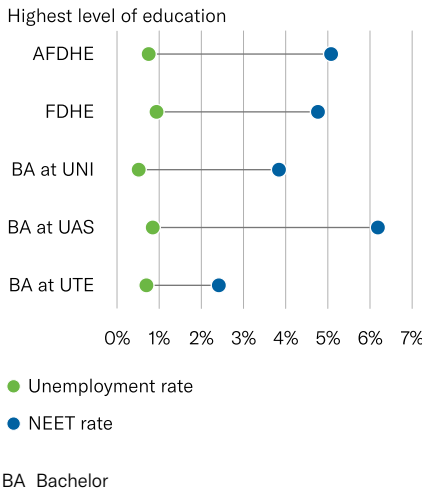
Data: FSO (eHBB); calculations: SCCRE



338 Labour market integration
1 year after tertiary qualification

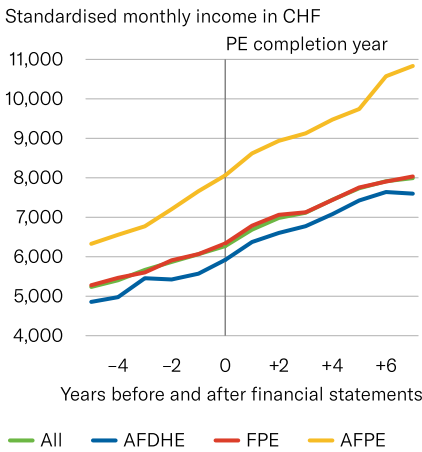
It shows the unemployment and NEET rates in December of the following year after completion of studies, taking into account individual characteristics (gender, lower-secondary level, migration status, canton of residence); NEET = not in education, employment or training

Data: FSO (LABB); calculations: SCCRE



339 Gross income before and after
a qualification in PE

Data: FSO (2023a)



documents: Graduates of professional education have similar employment opportunities to those who have completed a university degree (*McDonald & Korber, 2023; Rageth & Sritharan, 2022*).

Effects on wages

Multiple sources of data are now available on the income development of students in professional education . First, there is the survey on professional education (eHBB), which includes self-declared incomes. This source shows significant income growth in the year after training compared with income before training (professional education institution: +32%, Federal Professional Examination: +17%, Advanced Federal Professional Examination: +24 %) (*FSO, 2024s*). The salary increase is often a consequence of extended responsibilities, but interestingly, it is not only those who have passed the examination who benefit from such salary increases, but also those who have failed. However, the share of persons receiving a salary increase is lower among the latter, especially among those graduates who have completed a federal examination (*FSO, 2024h*). Particularly for persons studying at a professional education institution, it seems that not only the completion of their studies but also the training itself leads to a higher income.

Data from the OASI compensation office also shows steady growth in income. The advantage of this data is that it is not self-declared, but rather the earned income declared to the compensation office; it also includes persons who did not take part in eHBB. However, the disadvantage is that this data does not contain any information on the level of employment. To compensate for this disadvantage, the Federal Statistical Office (FSO) takes the working time from the structural survey data into account to calculate standardised incomes. According to this data, short-term income growth (one year after training compared to one year before) is somewhat more moderate (→ Figure 339) at +10%.

Data from the Swiss Labour Force Survey (SLFS) can also be used to record income trends in the long term and compare them with those of other tertiary-level qualifications. These show that the income of persons with a professional education qualification increases less strongly over the course of employment than that of persons with a higher education degree. Twenty years after completion of tertiary-level education, the income gap amounts to around a quarter of incomes, which is mainly due to the fact that persons with a higher education degree switch more often to professions with managerial responsibility or management functions (*Kriesi & Sander, 2024*). However, higher education takes slightly longer than professional education, which reduces the differences in terms of returns on education (→ *chapter Cumulative effects, page 347*).

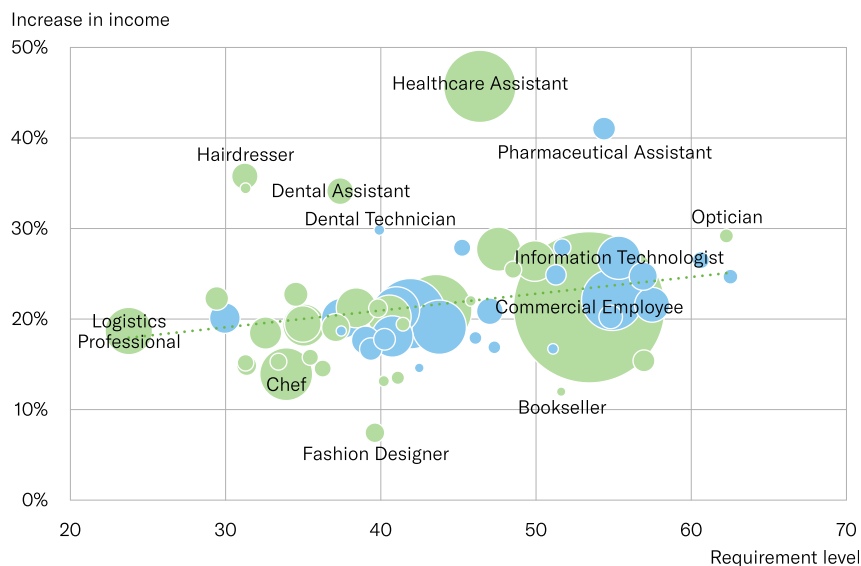
The incomes earned after professional education vary considerably, sometimes by gender (→ *Income by gender, page 318*), but mainly by occupation. Five years after graduation, incomes are comparatively high in the areas of management and administration or finance, banking and insurance, while rather low salaries are paid in the areas of social work or personal services (*FSO, 2023a*).

These job-specific income differences are also apparent when looking at the professions that graduates of professional education learned before completing their tertiary education, i.e. the VET diploma professions

originally learned (→ Figure 340). This illustration thus shows the VET diploma professions for which a training in professional education is particularly worthwhile in terms of income. There is no discernible connection with the requirement level or the duration of the study. Professional education can therefore also be worthwhile for persons in professions that are less demanding in scholastic terms, particularly in the health sector. Income that was relatively low prior to the level of professional education tends to rise more sharply. In addition, income one year after completion of professional education is significantly higher in all VET diploma professions than before the training, indicating that professional education is potentially worthwhile for all VET diploma professions considered here.

340 Income increase 1 year after PE training, by VET profession and its requirements

Data: FSO (eHBB); calculations: SCCRE



The **requirement level** is an expert assessment of the basic school requirements in mathematics, natural sciences, school language and foreign languages that must be met for admission to a specific VET diploma apprenticeship (www.anforderungsprofile.ch). The scale ranges from 1 (simple requirements) to 100 (very high requirements).

The green circles represent the three-year teaching professions, the blue circles represent the four-year teaching professions. The size of the circles indicates the number of learners.

Reading example

Persons with a VET diploma as a Healthcare Assistant (requirement level 46) earn on average 45% more than before after completing their training at PE.

Mobility

Professional education usually serves to specialise within a profession, particularly in the case of federal examinations. This is shown by the survey on professional education (eHBB): In the survey, around half of the students at a professional education institution and over 60% of those seeking a Federal or Advanced Federal Professional Examination cited a specialisation as the reason for choosing a course of study. In contrast, less than a third (professional education institution: 28%; Federal Professional Examination: 23%; Advanced Federal Professional Examination: 18%) named “preparing for another field of activity” as a training motivation (FSO, 2024h). A similar picture emerges when it comes to actual job changes: While around half of

students at professional education institutions with a more generalist orientation changed profession one year after completing their professional education, this figure is 34% for Federal Professional Examinations and only 26% for Advanced Federal Professional Examinations(FSO, 2022b).

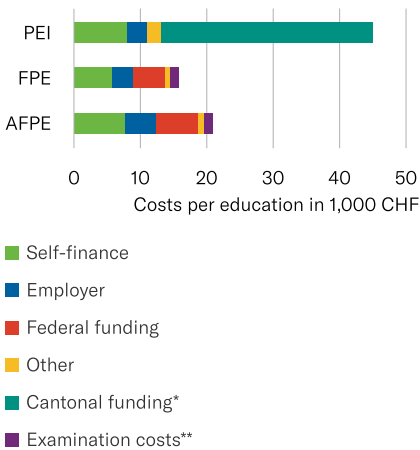
Professional education often leads to a change to a managerial position. For example, the share of persons in managerial positions one year after training is around 15 percentage points higher than before professional education, although these shares vary widely depending on the field of education. In addition, the share of persons in managerial positions is, on the one hand, higher among men, but on the other hand also amongst persons who stayed in the same company after completing professional education (FSO, 2022b).

Efficiency/costs

From a public sector perspective, compared to higher education institutions, professional education is relatively inexpensive. In 2022, the federal government and the cantons spent CHF 519 million on this, which corresponds to 1.2% of total public education expenditure or 5.5% of the costs of the tertiary sector (excluding basic research). According to the Federal Statistical Office (FSO), if these public costs are distributed amongst the number of students, this results in educational expenditure of just over CHF 13,000 per year per person in education. This corresponds to just over a third of the public costs of students at higher education institutions. However, public costs represent only a part of the total costs, as students – often supported by their employers or their families – bear a significant part of the costs themselves. However, even taking these costs into account, professional education is comparatively inexpensive.

341 Funding of PE training courses

Examination year 2022
Data: FSO, SERI; calculations: SCCRE



* The cantonal contribution to the PEI corresponds to an estimate based on the funding shares according to Frey & Meier (2022).
** Examination costs are estimates based on the total cost of organising the examinations and the number of candidates.

Funding of professional education institutions

The total cost of a course of education at a professional education institution is around CHF 45,000 on average (→ Figure 341). This corresponds to annual costs of around CHF 16,000, which accounts for around two-thirds of the costs of universities of applied sciences (only teaching basic education and training). Around two-thirds of the total costs are funded by the cantons through the Intercantonal Agreement on Funding Contributions for Study Programmes at Professional Education Institutions (ICA-PEI). The cantons each pay 50% of the average costs or 90% for courses of education of increased public interest. The federal government contributes to funding by means of a flat-rate contribution of 25% of the total costs of VET and professional education. This also includes the contributions to the federal examinations, which have been paid out via a separate expenditure ceiling since 2025, but continue to be included in the 25%.

The rest is mainly financed by tuition fees. According to data from the survey on professional education, the average course fees for education and training at a professional education institution amount to around CHF 13,100 in total. The majority, i.e. just under two-thirds, is paid by the students themselves, with around one-quarter being paid by the employers.

Depending on the sector of the education system, the tuition fees for each semester range between CHF 1,219 (Agriculture and forestry) and CHF 2,756 (Arts, creation and design), which is significantly higher than the tuition fees of CHF 800 to 1,000 at universities of applied sciences. Degree programmes in the healthcare sector are an exception, with tuition fees of just CHF 685 (Frey & Meier, 2022).

Funding of federal examinations

The federal examinations and the preparatory courses for these examinations cost comparatively little at just under CHF 15,000 (Federal Professional Examination) or just under CHF 20,000 (Advanced Federal Professional Examination). This is due firstly to the shorter duration of around two years for the Federal Professional Examination and two and a half years for the Advanced Federal Professional Examination. Secondly, the annual costs are also lower than for professional educational institutions. Around 40% of the costs are borne by the students themselves, almost a quarter is paid by the employer and one-third is covered by federal contributions.

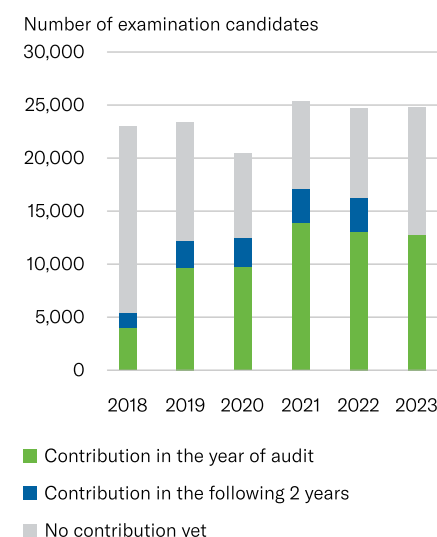
These federal contributions were introduced in 2018 as part of subject-oriented funding. Students can now apply for federal contributions amounting to 50% of the chargeable course fees (maximum CHF 9,500 for a Federal Professional Examination or CHF 10,500 for a Advanced Federal Professional Examination). Since their introduction, the contributions paid have risen steadily, which is tied to the replacement of the previous cantonal funding (→ Figure 342). In recent years, around two-thirds of all applicants have received federal funding.

In principle, subject-oriented financing reduced the financial burden for students preparing for a federal examination, as shown by a topical impact evaluation (Kaderli et al., 2025). According to information from the students, this reduces the costs they pay for the preparatory courses by around 10%. At the same time, however, course costs have also risen and employer contributions have fallen more sharply than expected. This means that not only students benefit, but also course providers and employers. It is unclear to what extent the reform has increased the appeal of federal examinations. Although more persons have taken a Federal Professional Examination since it was introduced (→ Figure 327), it is not known whether this increase is due to the reform.

342 Number of examination candidates with federal contributions

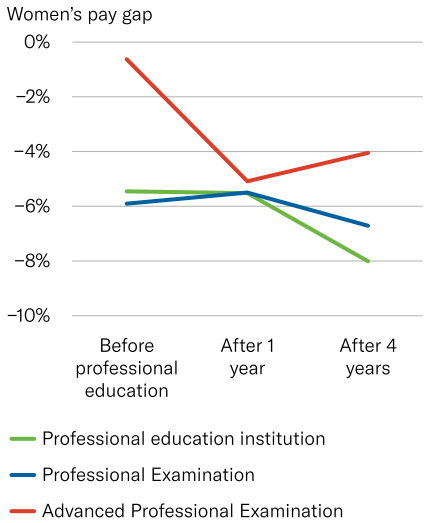
Candidates resident in Switzerland; the figures for 2020 and 2021 were possibly influenced by the COVID-19 pandemic.

Data: FSO



343 Income disadvantage of women after qualification at PE

Data: FSO (eHBB); calculations: SCCRE



The percentage differences in income are shown, taking into account occupation, region of residence, age, highest level of education, nationality, professional experience and position in the profession (e.g. management position), relative to the average income.

Income by gender

Women with a qualification in professional education earn significantly less than men (FSO, 2023a). This is also shown by the data from the survey on professional education. If only persons with the same vocational training occupations in professional education are compared and individual characteristics such as level of employment, age, professional experience and current professional status are taken into account, women earn around 5% less than men immediately after tertiary-level professional education. However, these income differences are not directly attributable to professional education, as similar differences already existed before, at least among professional education institution graduates or those taking a Federal Professional Examination (→ Figure 343). Other labour market factors are therefore likely to be responsible for these wage differences. Four years after completing training, the wage gaps increase significantly. The development is different for persons who have taken an Advanced Federal Professional Examination: Here, the wage differences increase during the training and decrease again in the first four years after the training. However, this is attributable to wage trends in a few professions, as only around 20% of Advanced Federal Professional Examinations are taken by women.

COMPULSORY EDUCATION

UPPER-SECONDARY EDUCATION

TERTIARY-LEVEL EDUCATION

**CONTINUING EDUCATION
AND TRAINING**

CONTINUING EDUCATION AND TRAINING

Context

Importance of continuing education and training

Continuing education and training (CET) is of key importance for highly developed knowledge-based societies such as Switzerland. Digitalisation and automation are shaping structural change in almost all industries and leading to qualification requirements that are changing at an ever faster rate. At the same time, the half-life of skills is becoming shorter, making lifelong learning a prerequisite for securing employability. Demographic trends also show that the share of older workers in the workforce is continuing to increase. This presents companies with the challenge of systematically preserving and developing knowledge and skills, as the generational renewal takes place more slowly. Finally, technological change is making it increasingly difficult for people with no qualifications above compulsory schooling or with insufficient digital skills to integrate into the labour market in the long term, which in turn increases their need to catch up by completing formal education programmes as adults. This applies in particular to persons low levels of formal education who immigrated to Switzerland only as adults. Continuing education and training plays a key role for this group, both in acquiring a formal qualification as well as in procuring professional and digital skills. In order to promote integration into the labour market, low-threshold and needs-based educational opportunities must be created, especially for persons with a low formal education. Above all, language deficits need to be remedied in order to improve career opportunities in the economy.

Continuing education and training has different functions. Firstly, it serves to safeguard individual employability in order to retain skills or acquire new ones, with the aim of adapting to changing labour market requirements and technological change. Continuing education and training helps adults to close gaps in basic skills. It is also frequently required as part of labour market measures for reintegration into the labour market. Secondly, continuing education and training encourages personal development. It helps individuals to develop on a personal basis, build self-confidence, pursue interests and improve their quality of life. It makes it possible to expand knowledge and skills beyond the professional context into old age. Non-work-oriented continuing education and training as well as general adult education cover practically all areas of life, from politics to cultural and sporting activities in the leisure sector. The functions and target groups of this type of continuing education and training are correspondingly varied. Thirdly, continuing education and training strengthens social participation. It promotes social, economic and cultural integration, in particular of persons with a migration background or with little education. Fourthly, continuing education and training strengthens innovation and economic growth in general. At macroeconomic level, it helps to strengthen the innovative capacity and competitiveness of companies and economies. A well-trained workforce is a key factor in developing new technologies, products and services.

The term “continuing education and training”

The term “continuing education and training” – understood as part of life-long learning – refers to non-formal educational activities. This means structured education that takes place outside the formal education system.¹ Non-formal education includes courses, conferences, seminars, private lessons and on-the-job training (FSO, 2022c). The preparatory courses for the Federal Professional Examinations and Advanced Federal Professional Examinations are not regulated by the state and therefore do not form part of formal education. Attendance at these courses is not a requirement for a formal qualification (→ *chapter Professional education, page 303*). Similarly, continuing education and training at higher education institutions falls under non-formal education, even if such programmes award their own certificates, such as the Master of Advanced Studies (MAS). These certificates are not consecutive university degrees;² they are not part of the formal education system. Finally, in the context of continuing education and training, informal education³ is also taken into account, in other words, learning processes that take place outside a structured framework and without an explicit learning relationship – such as independently reading specialist literature.

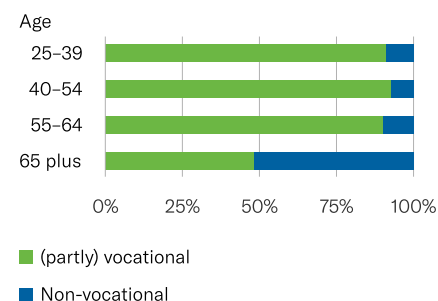
Most non-formal educational activities are undertaken for professional reasons (→ Figure 344). Amongst the working population, continuing education and training activities that are taken place for other reasons account for only a very small share. In addition, the generally observed decline in continuing education and training since the COVID-19 pandemic was even more pronounced in non-job-related continuing education and training (→ *Effectiveness, page 333*).

However, non-vocational continuing education and training is gaining in importance for those who retire, even if the participation rates of the older population are low (FSO, 2022c; Seifert et al., 2021). Continuing education and training will primarily be considered in relation to aspects of the employability of the working population in this chapter. This is due, on the one hand, to the importance of continuing education and training on the labour market, from both an individual and a societal perspective. On the other hand, methodological reasons play a key role as well: The assessment of the effectiveness, efficiency or equity of continuing education and training to be conducted as part of education monitoring suggests a labour market perspective.

344 Reason for continuing education and training, 2024

Persons who have participated in non-formal educational activities in the last 4 weeks, by age group

Data: FSO (SLFS); calculations: SCCRE



¹ Art. 3a Federal Act on Continuing Education and Training (CETA) of 20 June 2014.

² Art. 10 para. 2 University Council Ordinance on the Coordination of Teaching at Swiss Higher Education Institutions.

³ Art. 3d CETA.

Structural change through digitisation and automation

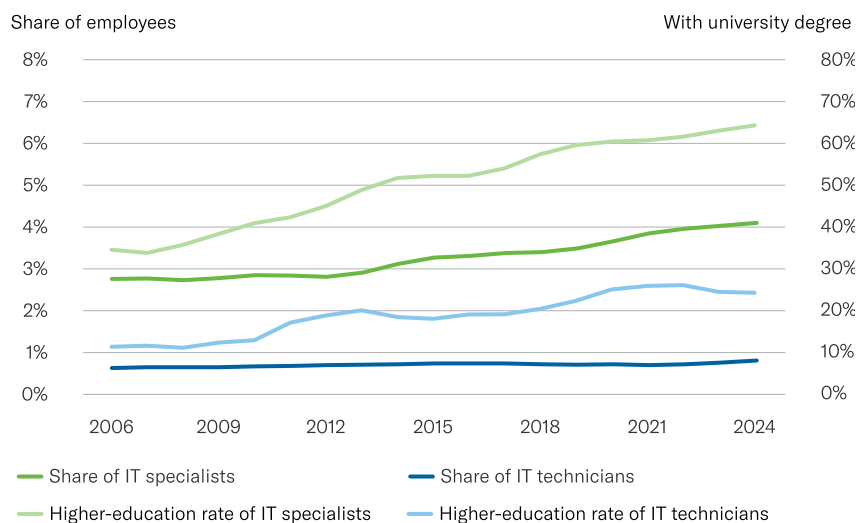
The structural change driven by technological development is reflected in the change of skills required, which in turn affects the need for continuing education and training. While automation first eliminated routine-based manual tasks in industrial production and replaced them with tasks requiring more cognitive skills, digitisation has been spurring a similar process in the service professions for several years now: Routine cognitive activities are being replaced by non-routine ones that usually call for other skills, which can be acquired increasingly only through a tertiary level qualification.

In Switzerland, this development can be seen in the light of the changes in the ICT sector (→ Figure 345): Over the past 20 years, employment growth has been disproportionately high amongst highly-skilled IT specialists, while the share of technical occupations in the sector has remained fairly constant. At the same time, the share of persons with a higher education qualification is increasing sharply. The increase in the higher education rate among IT specialists is primarily due to the sharp decline in the rate of persons with qualifications in professional education (PE).

345 Upskilling in the field of ICT

Share of employees in ICT and qualification level, 2006–2024; 25–64-year olds in employment; three-year moving averages

Data: FSO (SLFS); calculations: SCCRE



Digital skills and working with artificial intelligence

Technological change and the new opportunities offered by the spread of generative AI are having a major impact on the labour market and skill needs. However, the consequences are perceived differently in the literature. While some studies predict significant job losses (*Frey & Osborne, 2017*), others see major benefits and new employment opportunities (*Autor, 2022*). David Autor (2022) describes a polarisation in the labour market. The number of jobs in the middle qualification sector is decreasing, while

those for low- and highly-qualified persons are increasing. It is not expected that entire professions will be automated, but specific activities in particular (Hampole et al., 2025). However, this will have a significant impact on the qualification requirements within these fields of activity. The effects of this structural change therefore also depend on how well society reacts to changes in the labour market with education and continuing training measures and which framework conditions are created by policymakers for this purpose.

One would actually expect workers in sectors and occupations that are particularly threatened by automation and AI to respond by increasing their training efforts. More recent work shows that the focus has changed considerably in the professions under threat. Whereas ten years ago, jobs in which manual, repetitive activities were performed in the low-wage segment were considered to be at risk (Frey & Osborne, 2017), today it is more cognitive activities in qualified professions that risk being replaced by the development in AI applications (Felten et al., 2023). Structural change is therefore now affecting qualified workers who are used to continuing education and who are already investing a great deal in CET. Figure 346 shows the continuing education and training activities of workers whose occupations are threatened to varying degrees by the current technological upheavals. This risk is measured based on expert judgements regarding the probability of automation. Because the perception of this risk has changed considerably with the spread of generative AI, completely different professions are now threatened by automation. Correspondingly, other CET behaviour can be observed: While those in employment with a high risk of automation participate least in CET according to the 2017 index, those in the professions most at risk according to the 2023 index (Felten et al., 2023) make the greatest efforts in continuing education and training. Those target groups that have the greatest need in view of the structural change tend to make the greatest efforts in continuing education and training. However, it is not yet possible to assess whether these efforts will be sufficient to maintain their employability.

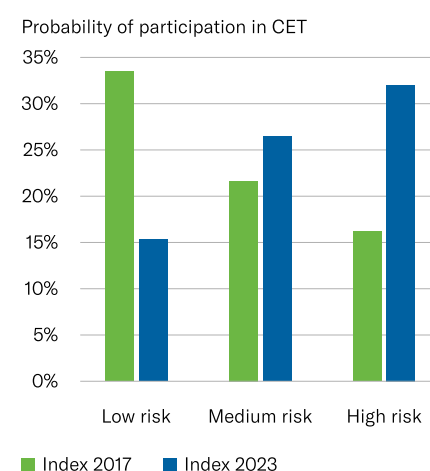
Qualification needs and migration policy

Structural change, which is reflected particularly in an increasing demand for skilled workers with a tertiary qualification, is also reflected in migration policy. Since the bilateral agreements with the EU have come into force, local companies have found it much easier to recruit highly-skilled workers from EU/EFTA countries. This development is reflected in the sharp rise in the tertiary education rate of foreign employees (→ Figure 347).

346 Automation risk and continuing education and training activity

Estimated probability of participating in continuing education and training after low, medium or high automation risk

Data: FSO (SLFS); calculations: SCCRE



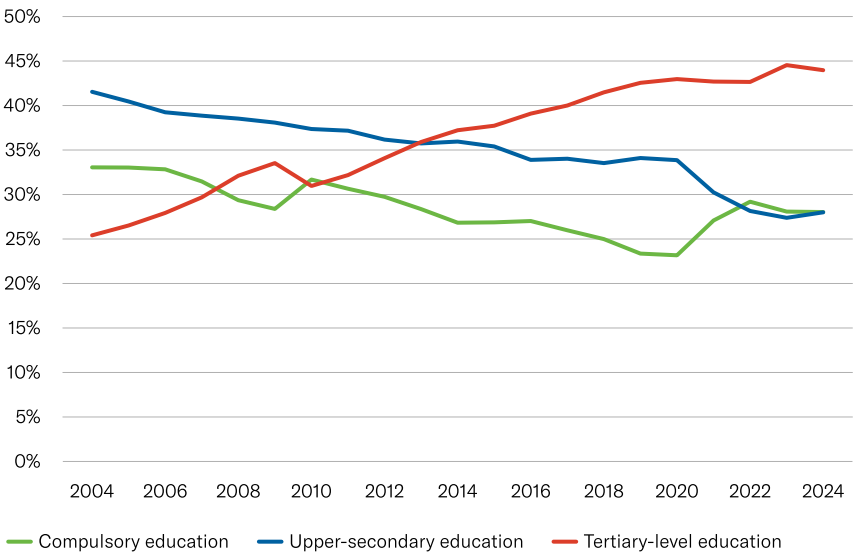
The probability of participation in continuing education and training is estimated for different levels of automation risk, taking into account the characteristics of the person, the education and the labour market situation.

Categorisation is based both on the 2017 index of Frey and Osborne (2017) (green columns) and the 2023 index of Felten et al. (2023) (blue columns). The index from 2023 assesses the exposed position of professions to the ongoing development of language modelling through generative AI.

347 Qualification structure of the foreign population

Foreign population aged 25–64, 2004–2024 by highest educational qualification; 2021 and 2023: Break in the time series due to adjustment of the survey method and the survey instrument

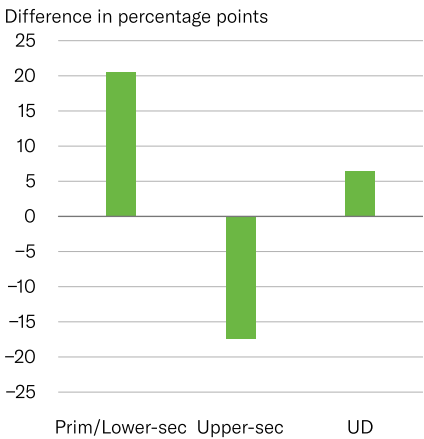
Data: FSO (SLFS); calculations: SCCRE



348 Distribution of education levels, 2024

Difference between Swiss nationals and foreign nationals

Data: FSO (SLFS); calculations: SCCRE



UD University degree

Reading example

The share of persons without post-compulsory education amongst foreign nationals is a good 20 percentage points higher than amongst Swiss nationals; conversely, the share of persons with upper-secondary education (such as vocational apprenticeship) among Swiss nationals is around 18 percentage points higher.

Swiss migration policy has traditionally been designed such that companies were able to recruit foreign workers in addition to the qualification structure of the Swiss population. Accordingly, foreign nationals mainly have qualifications at those levels of education at which the Swiss population is less strongly represented. These include both low-skilled persons and those with a university degree. Persons with an upper-secondary education qualification (upper-secondary level) are already sufficiently represented among Swiss nationals and are therefore recruited less from abroad (→ Figure 348).

Depreciation and preservation of skills

Skills and abilities lose value over time. Various studies with competence measurements in adults show that the decline in skills already sets in at middle age. The process depends on the level of education and the labour market status, as well as on the type and frequency of use of skills (*Hanushek et al., 2025*). Higher-skilled workers face greater challenges in maintaining the skills they have acquired and to undergo regular further training to counteract this depreciation process. This is reflected, for example, in the fact that persons in higher-qualified professions are more likely to take part in continuing education and training (→ Figure 349). In highly-skilled occupations – in the ISCO occupational classification these correspond to the first three main groups⁴ – employees complete more continuing education and training, regardless of their formal qualifications. In lower-skilled professions, on the other hand, formal qualifications are important – employees with higher qualifications complete continuing

4 1. Managers, 2. Academic professions, 3. Technicians

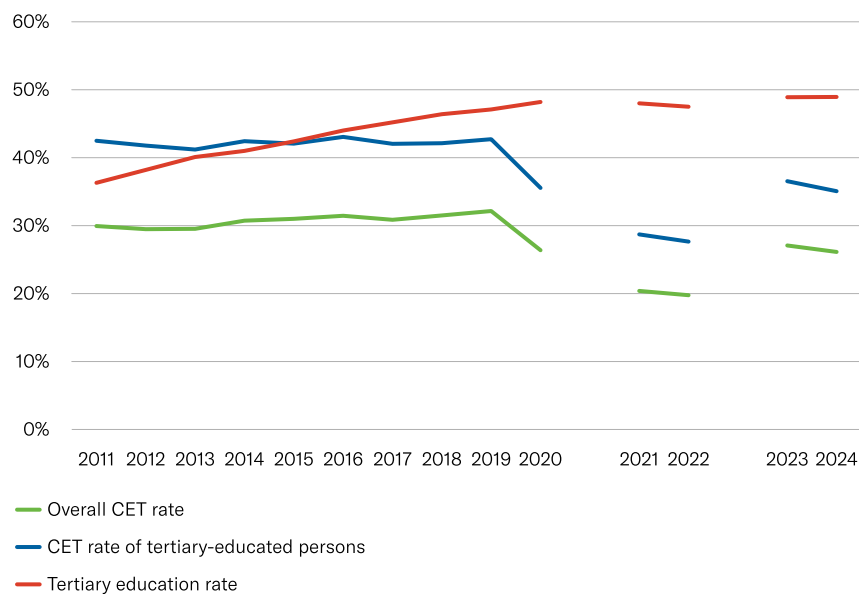
education and training more often overall. With this observation, one might be inclined to view the occupation as a decisive factor for participation in continuing education and training. However, formal education ultimately determines which profession an individual can pursue and thus indirectly whether and to what extent they participate in continuing education and training activities.

In view of the rising share of tertiary-educated individuals, one should actually expect the average rate of continuing education and training to rise as well, because those in higher-skilled employment are most affected by the depreciation of knowledge and would therefore have to undergo continuing education and training much more frequently. An evaluation of the continuing education and training activities of the population shows that this is not the case (→ Figure 350). The rising tertiary education rate is not reflected in a higher rate of continuing education and training. The fact that we are not seeing an increase in the overall ratio of continuing education and training means that the CET activities of persons who do not have a tertiary qualification have also declined.

350 Tertiary education rate and participation in continuing education and training, 2011–2024

Participation in non-formal education in the last 4 weeks; working population, aged 25–64; 2021 and 2023: Break in the time series due to adjustment of the survey method and the survey instrument

Data: FSO (SLFS); calculations: SCCRE

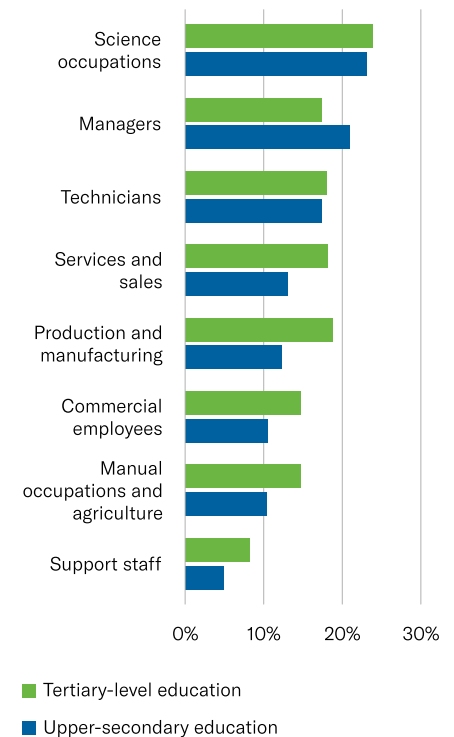


Until 2019, the rate of continuing education and training remained stable despite the rising share of tertiary-educated workforce, indicating that the latter were able to prevent a general decline in continuing education and training activities. Following the slump during the COVID-19 pandemic, the picture changed. As there was now also a sharp decline amongst those with tertiary education, the overall share fell significantly. The extent to which the participation rate has recovered after the pandemic is difficult to estimate due to the breaks in time series (→ Figure 350).

349 Continuing education and training by occupational group and educational level, 2024

Participation in vocational CET courses, employed population, aged 25–64; weighted percentage values

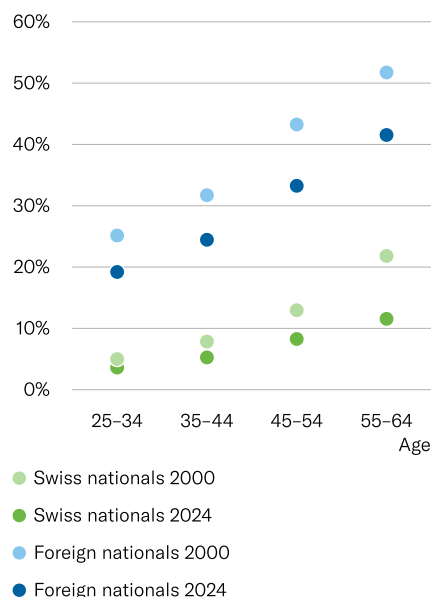
Data: FSO (SLFS); calculations: SCCRE



351 Proportion of low-skilled workers by age and nationality

Proportion of low-skilled workers (persons without post-compulsory education) within an age cohort, 2020 and 2024

Data: FSO (SLFS); calculations: SCCRE



Individuals with weak qualifications

Amongst the employable population, those with weaker qualifications and no post-compulsory education constitute a special group that potentially has a strong need for continuing education and training. The size of this group has been decreasing steadily in recent years. Between 2000 and 2020, the number of Swiss nationals without post-compulsory education practically halved across all age groups, and is now only around 5% (→ Figure 351).

This development illustrates the success of the education policy, which has set the target of a qualification rate of 95% for upper-secondary education (→ *chapter Upper-secondary education, page 111*). Swiss nationals under the age of 45 have currently reached this goal. The situation amongst foreign nationals is different. The new migration policy (*Cattaneo & Wolter, 2015*), which makes selection more contingent on qualifications, also led to a decline of around 20% in the number of persons with low qualifications. Nevertheless, today more than one in four foreign nationals still does not have a post-compulsory education qualification.

In terms of CET policy, this means that the problem for those with weak qualifications is of decreasing importance – especially as far as the Swiss-born individuals are concerned; however, it will not solve itself, even in the medium term. Ten years from now, the share of low-skilled persons amongst the Swiss population is expected to drop below 5%. However, amongst those of foreign nationality, practically every fifth person will still be in the weak skills category in ten years from now. Measures for tackling this problem must be aimed both at the formal education of those migrants who have completed at least part of their schooling here (→ *chapter Upper-secondary education, page 111*), as well as the targeted continuing education and training for persons who immigrated to Switzerland only as adults. This would involve promoting basic skills as well as eliminating deficits in formal education, as well as, not least, creating more opportunities to acquire formal educational qualifications (such as vocational and professional education and training for adults).

Skills of adults

Switzerland's participation in the PIAAC (Program for the International Assessment of Adult Competencies) international OECD Adult Competencies Survey in 2023 provided more precise data on the distribution of skills amongst the population for the first time since 2003. The survey measures the skills required of adults in everyday life and work, particularly in the areas of reading, everyday mathematics and adaptive problem solving. These skills play a key role in dealing with everyday information and form the basis for successful integration into the labour market and participation in society. On the one hand, the PIAAC survey provides an overview of the distribution of skills amongst the population in Switzerland and, on the other, it positions them in an international comparison (*FSO, 20240*).

Switzerland achieves an average performance by international standards. With 266 points, the average reading skills correspond to PIAAC Level 2. This puts Switzerland at the same level as the average of all participating countries. Finland, Japan, Sweden, Norway and the Netherlands perform better than Switzerland in all three skills areas (*FSO, 20240*). In addition

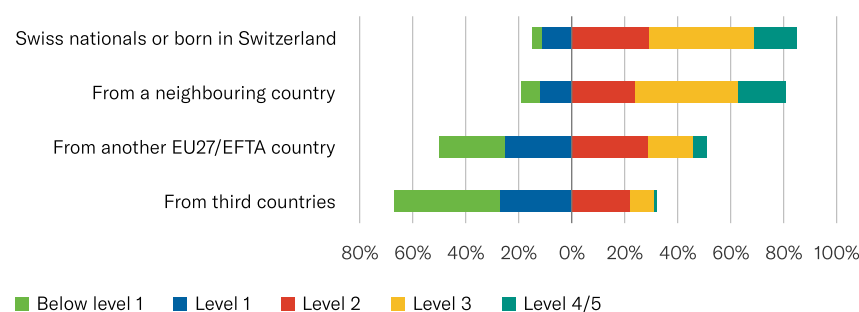
to the national average, however, the distribution of the population across the different skill levels is relevant. After all, it is only by defining skill levels that the findings can be interpreted. According to OECD (2024), a test performance at Level 1 and lower means insufficient reading skills (→ *margin text*). In Switzerland, 22% of adults reach a maximum of Level 1, while in Finland it is only 12% (FSO, 2024o).

The analyses show that characteristics such as age, level of education, region of origin and first language correlate most strongly with test performance. An evaluation according to origin and first language thus reveals significant differences. While the proportion of adults with inadequate reading performance amongst the local population (Swiss nationals or persons born in Switzerland) still accounts for 15%, it is 67% amongst adults from third countries (→ Figure 352).⁵ Even though the majority of the foreign population in Switzerland comes from EU or EFTA countries – in other words, not from third countries – the finding that two-thirds of adult immigrants from non-European countries have insufficient reading skills in one of the national languages presents a serious problem.

352 Reading skills by migration status, 2023

Percentage distribution of the population at the skill levels by region of origin; permanent resident population aged 16–65

Data: FSO (2024o)



However, the results of the 2023 PIAAC survey also need to be seen in the Swiss context. Switzerland already participated in an international survey of adult skills with the OECD Adult Literacy and Lifeskills (ALL) survey around 20 years ago (FSO, 2005). The ALL survey does differ from the PIAAC survey in a number of respects, such as the test design, the scales and the definition of skills. As with the PIAAC, however, the main objective of ALL was to measure the basic everyday skills of the adult population and to be able to draw conclusions about their distribution (FSO, 2005). Even at that time, Switzerland ranked in the midfield in terms of reading skills amongst the participating countries.⁶ The share of persons with insufficient reading skills (level 1) in Switzerland was around 15% at this time (→ Figure 353).

⁵ The tests were carried out in one of the national languages, as this is of key importance for everyday life and participation in the working world. Part of the weaker results of the foreign population can be attributed to the fact that many participants took the tests in a foreign language; amongst persons from third countries, this was the case for 87% of those surveyed (FSO, 2024o).

⁶ Six countries took part in the first ALL survey: Switzerland, Norway, Italy, Canada, the United States and the British overseas territory of Bermuda (FSO, 2005).

Insufficient reading skills in PIAAC

According to the evaluation framework defined by the OECD (OECD, 2021b, 2024; FSO, 2024o), reading skills below 176 points (level 1 and below) are insufficient. This means that there is a lack of the basic skills required in everyday life, in the workplace and for social participation. Persons at Level 1 can grasp individual information in simple texts, but have difficulty interpreting more complex information or understanding texts with several paragraphs. Persons at a level below 1 have very limited basic skills and can only read to a very limited extent. They are often unable to extract even basic information from short, simple texts, which in effect amounts to functional illiteracy.

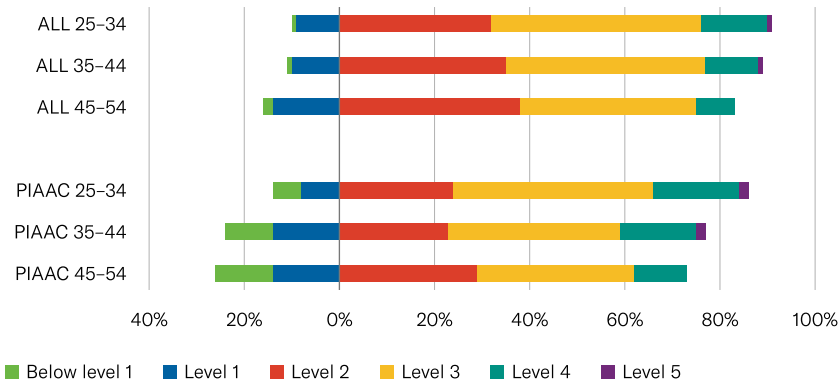
353 Adult skills, 2003 and 2023

Reading skills of the adult population; percentage distribution across competence levels; results based on trend variables for ALL (2003) and PIAAC Cycle 2 (2023)

Data: OECD (ALL 2003, PIAAC 2023); calculations: FSO

ALL survey, 2003
Sample: n = 5230
Response rate: 40%
Share of persons with a migration background (born abroad): 22%
Share of persons with a tertiary qualification: 23%

2023 PIAAC study
Sample: n = 6431
Response rate: 29%
Share of persons with a migration background (born abroad): 33%
Share of persons with a tertiary qualification: 40%



In this type of comparison, it must be taken into account that the definition of skills in the two surveys was made at different points in time. This has implications both in terms of content – in other words, the question of which skills were considered relevant – as well as in terms of the performance standard, which describes what was considered sufficient performance in the situation at the time. It should also be taken into account that the composition of the population in Switzerland has changed considerably over the past 20 years: The share of persons born abroad has risen by around one-third, while that of persons with a tertiary education has risen even more sharply. In view of the marked increase in the number of persons with tertiary education, significantly better results could have been assumed from the PIAAC results.

The findings of the PIAAC survey can be interpreted in two ways. Taking into account the 2003 ALL results and assuming that the definition of insufficient skills has remained fairly stable over time, current performance should have been significantly better in view of the expansion of tertiary-level education. In this case, the current result would mean that the average reading performance of adults would have deteriorated. This applies in particular if it is assumed that the younger cohort in ALL is roughly the same as the older cohort in PIAAC. The question therefore arises as to why, despite the significantly more qualified population, better results were not achieved in terms of adult skills.

In the other case, it is assumed that the cognitive requirements have increased today, so that each skill level in PIAAC is higher than in ALL. However, this interpretation also raises urgent questions of education policy. After all, if the skill requirements of adults have increased to such an extent that more than one in five people is inadequately equipped for everyday life, this results in a high need for continuing education and training and a post-qualification. Furthermore, this second interpretation means that a longitudinal comparison is not possible at all, assuming that skill measurements are linked to their respective temporal context and are not valid over time.

Institutions

CET market

The continuing education and training market in Switzerland is decentralised and predominantly organised in the private sector. Where continuing education and training is publicly promoted and funded, this is conducted on the basis of various cantonal and federal laws as well as social insurance schemes. Only a few cantons have their own laws governing continuing education and training exclusively (Sgier *et al.*, 2022).

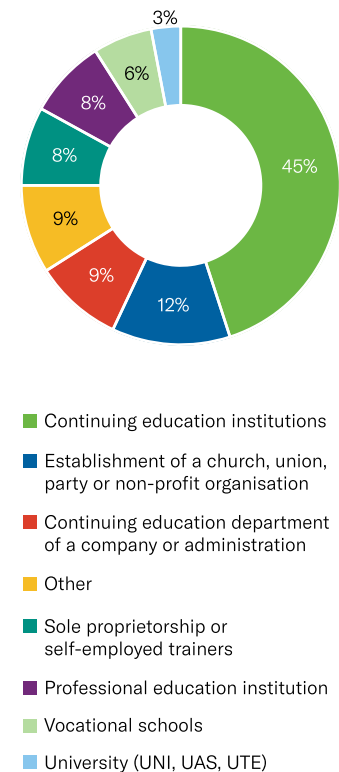
The Continuing Education and Training Act (CETA) has been instrumental in defining the principles of continuing education and training and determining the general requirements for financial assistance from the federal government since 2017. It is designed as a framework act intended to standardise the application of various special laws at the federal level. Continuing education and training should only be supported with public funds where there is a public interest, such as supporting basic skills amongst adults.

The market for continuing education and training is dominated by private providers. These include civil-law, for-profit and not-for-profit providers. According to the provider survey conducted by the Swiss Federation for Adult Learning (SVEB), two-thirds of providers are in the private sector (→ Figure 354). Amongst these, private companies are some of the largest providers of continuing education and training in terms of numbers. For them, further education and training, which is usually managed internally for the benefit of the workforce, is not the main goal of their economic activities. Accordingly, their offers are not publicly accessible. Almost half of the programmes for continuing education and training are provided by private organisations. In addition, non-profit-oriented and charitable providers such as associations, industry organisations, social partners and church institutions are active in continuing education and training. In the majority of cases, these are smaller organisations with fewer than 50 employees. A quarter employs a maximum of ten people (Caccho & Gollob, 2024). Besides private sponsors, the federal government and the cantons also sponsor institutions. These include, in particular, vocational schools, professional educational institutions and higher education institutions. In 2023, almost 14,000 people attended continuing education and training courses as part of higher education at universities (UNI), universities of applied sciences (UAS) or universities of teacher education (UTE). At the universities of applied sciences, the number of persons attending courses for continuing education and training corresponded to around 11% of Bachelor's students in 2023 (→ Figure 355). However, as continuing education and training are generally less time-consuming than consecutive training, CET activities (measured in terms of the ECTS spent) are significantly less important than basic education. According to a survey by the Swiss Federation for Adult Learning (SVEB), most providers recovered slightly in 2023 after the sharp slump in 2020. More than half of the organisations also expected an increase in demand for 2024 (Caccho & Gollob, 2024).

The thematic focus of the continuing education and training education programmes is very broad. The most common are activities in the three areas of business and labour, science and technology, and information

354 Sponsorship of continuing education and training providers, 2024

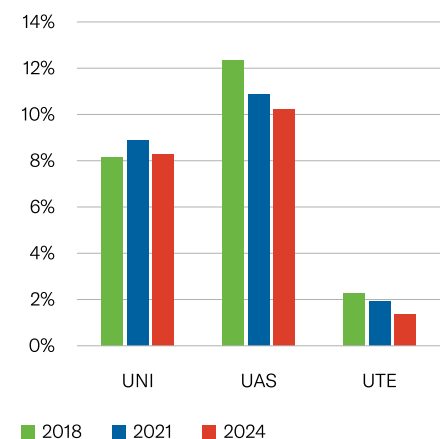
Data: SVEB



355 Continuing education and training at higher education institutions

Share of participants at events of higher education institution courses relative to all Bachelor's students by higher education institution type

Data: FSO (SHIS-studex); calculations: SCCRE



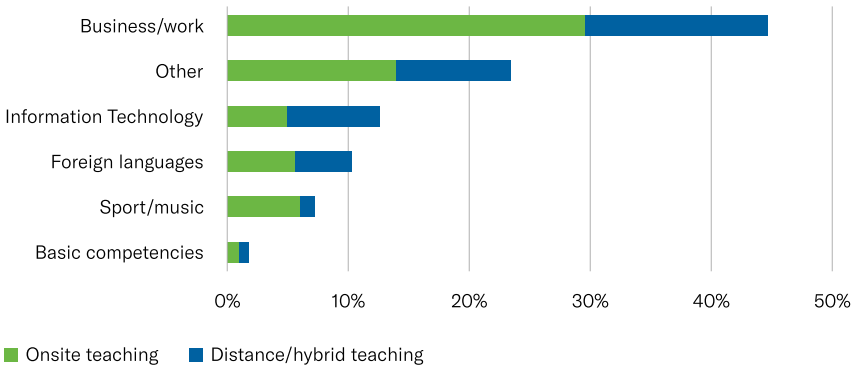
technology. Continuing education and training courses are also frequently attended in the areas of languages, sport and art, although the latter mainly in the area of non-work-related activities (FSO, 2022c). The thematic focus of continuing education and training providers is as follows: Almost two-thirds of the institutions surveyed by the Swiss Federation for Adult Learning offer in-company and job-specific continuing education and training, with 22% offering general continuing education and training and 18% offering courses in the area of basic skills (Caccho & Gollob, 2024).

Many providers now offer digital or hybrid forms of teaching (Poopalapillai & Buchs, 2023; Caccho & Gollob, 2024). Participants in the PIAAC survey reported that in most areas around a third of activities were completed as distance learning or in a hybrid mode, in other words, in a combination of online and face-to-face teaching. In the field of IT, this share is higher (→ Figure 356).

356 Organisational forms by thematic focus, 2023

Share of continuing education and training activities of the total activities by organisational form and thematic focus

Data: OECD (PIAAC); calculations: SCCRE



Effectiveness

Difficult target definition in continuing education and training

In order to draw conclusions regarding the effectiveness of continuing education and training, the extent to which certain objectives are being achieved would have to be addressed. This would require not only a clear target definition of objectives but also suitable measures for gauging the output. Both conditions are difficult to meet in CET, especially in view of the wide diversity of continuing education and training activities. Their goals vary as much as the participants themselves. In addition, considerable heterogeneity exists in terms of the content, scope and intensity of the offers. In contrast to formal education, non-formal education largely lacks explicit educational policy objectives as well as suitable indicators to measure them. The policy objectives are therefore usually formulated in general terms – they emphasise the promotion of continuing education and training in order to strengthen the domestic labour force or to mitigate the negative effects of structural change, while at the same time promoting the basic skills of adults.⁷

The lack of uniform goals also makes it mostly impossible to determine the extent to which the skills were achieved. In some cases, participant surveys are used to check the attainment of goals. As a rule, the personal assessment of learning success and the achievement of certain skills is determined. Such surveys also analyse outcomes, such as how well certain content can be applied in everyday working life vis-à-vis prior expectations on the course. However, such information is only available for individual continuing education and training activities and is not standardised at the place of origin. In other words, it does not provide a comprehensive view of the outputs and outcomes of CET activities in Switzerland. As these are lacking, there are efforts underway to measure the effectiveness – especially in vocational CET – by means of objective data on labour market integration and success. The focus here is on questions concerning a person's employment status after completing a CET programme, how much he or she earns, and about issues concerning his or her career at this point. From a broader perspective, however, it is impossible to make conclusive statements about the effectiveness of CET, as standardised before-and-after comparisons do not allow any conclusions to be drawn about the causal effect of CET due to the manner of selection in CET (self-selection by participants and external selection by employers).

Participation shares

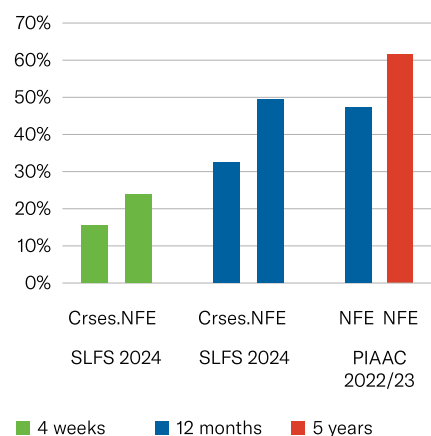
To describe the system of continuing education and training and as a measure of target achievement, the output is usually operationalised in the form of statistically collected participation rates. Persons who took part in continuing education and training during a reference period are compared to the total population. However, such a participation rate is frequently not very meaningful because it does not include the type of educational activity

⁷ Message for promoting education, research and innovation in the years 2025–2028.

357 Different measures in the survey of continuing education and training rates

Continuing education and training rates according to concept and reference frame, population aged 25 to 64

Data: FSO; calculations: SCCRE



Courses: continuing education and training courses only

NFE: non-formal education (courses, seminars or other forms of continuing education and training)

(courses, seminars, conferences or other forms) nor its duration. The uncertainties are particularly problematic when course participation rates are compared across different population groups or countries.

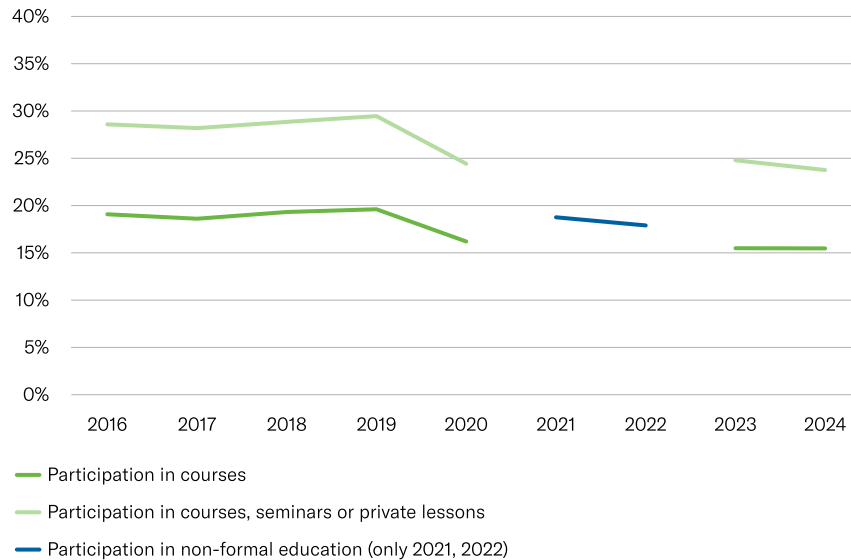
Various surveys and concepts lead to different rates, as the comparison of different measures for Switzerland shows (→ Figure 357). The rate depends on the way continuing education and training activities are recorded – such as courses, seminars and conferences or training on the job – as well as on the time frame of reference (→ *margin text on the next page*) or on the survey itself. The measured rate varies depending on whether it is a general labour force survey (such as the Swiss Labour Force Survey [SLFS] of the Federal Statistical Office), or a monothematic survey such as the Micro-census on Continuing Education and Training (MZB) or the PIAAC competence measurement.

Due to the conceptual problems described above, only comparisons over time or on an international basis with other countries can be made to interpret participation rates. The data from the Swiss Labour Force Survey is used below for a longitudinal perspective in Switzerland. However, this shows a break in the time series in 2021 and 2023 that can be attributed to changes in the constructs for measuring CET as well as in the survey methods (→ Figure 358). It is therefore not possible to examine exactly how continuing education and training has developed since the COVID-19 pandemic. After the slump in continuing education and training activities in 2020, a recovery could have been expected in subsequent years. This cannot be verified from the values collected, however, as the measurements used in 2021 and 2022 do not measure the same as in 2020. In 2021 and 2022, continuing education and training were classified as non-formal education, with no further distinction being made between different forms. To provide comparison with other years, Figure 358 shows the rate resulting from taking into account other forms of continuing education and training recorded separately, in particular courses, seminars and private tuition (see light green line in Figure 358). However, research shows that a participation rate is higher if not only non-formal educational activities are surveyed, but different forms of continuing education and training are recorded separately (*Moraal & Schönfeld, 2012*). It is therefore assumed that the rate calculated from separate sub-constructs (light green line) tends to overestimate participation, while the rate calculated using the comprehensive construct of non-formal education (blue line) tends to underestimate participation. Development from 2023 onwards, measured using the rates for which separate sub-constructs were again used, is thus more comparable with development up to 2020. The latest figures indicate that the continuing education and training rate has now settled at a lower level. This suggests that participation in continuing education and training in Switzerland has declined overall since the COVID-19 pandemic (→ Figure 358).

358 Development of continuing education and training rate, 2016–2024

Participation in continuing education and training (last 4 weeks), various constructs; population aged 25–64. 2021 and 2023: Break in the time series due to adjustment of the survey method and the survey instrument

Data: FSO (SLFS); calculations: SCCRE



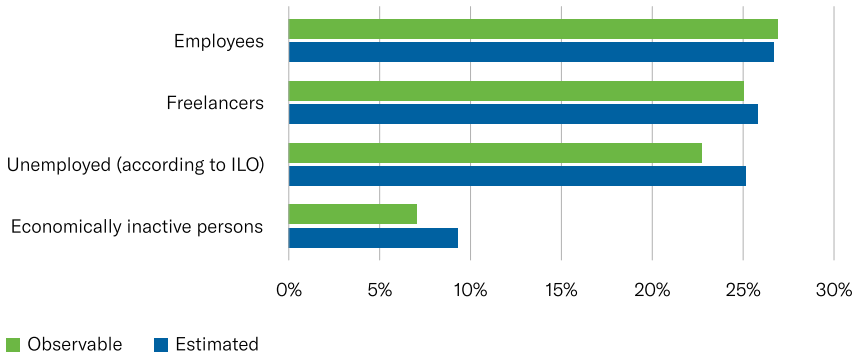
When participating in continuing education and training, differences between persons with different employment statuses can be observed (→ Figure 359). Participation rates are lowest by far for persons who are not gainfully employed. The difference between unemployed and employed persons, on the other hand, is much smaller because the former participate in continuing education and training activities as part of labour market measures. These small differences in the probability of participation can partially be explained by factors such as gender, age and education and therefore disappear almost completely if these factors are controlled for. The major difference between the propensity for further education among economically inactive persons and that among employed persons, however, remains very large even after controlling for these factors and cannot be explained by the decline in further education activities after retirement, since this concerns only individuals of working age up to 64 years. For the group of inactive persons, however, regular continuing education and training activities would be an important requirement for returning to the labour market more easily at a later date (*Diener et al., 2015*).

Framing effect due to the temporal reference frame

The rates recorded for a reference period of 12 months are only about twice as high as those obtained for a four-week observation period (→ Figure 357). In view of the average duration of CET of 1–2 days, the rates in the shorter frame of reference appear to be significantly excessive. If only about twice as many persons claim to have taken part in continuing education and training as they do in a four-week period over 12 months, the average duration of the individual activities would have to be unrealistically high to justify this rate. However, it is more likely that the observed difference is due to a reference framework (framing) effect: When asked about continuing education and training during the last four weeks, respondents are inclined to mention activities outside the reference period. As a result, the rate is systematically overestimated for shorter time windows. Conversely, shorter continuing education and training courses are forgotten over a longer period of time, which tends to underestimate the rate.

359 Continuing education and training by employment status

Participation in non-formal education (last 4 weeks), population aged 25 to 64, mean values for the years 2021 to 2024; descriptive and estimated values taking into account gender, age and education
Data: FSO (SLFS); calculations: SCCRE



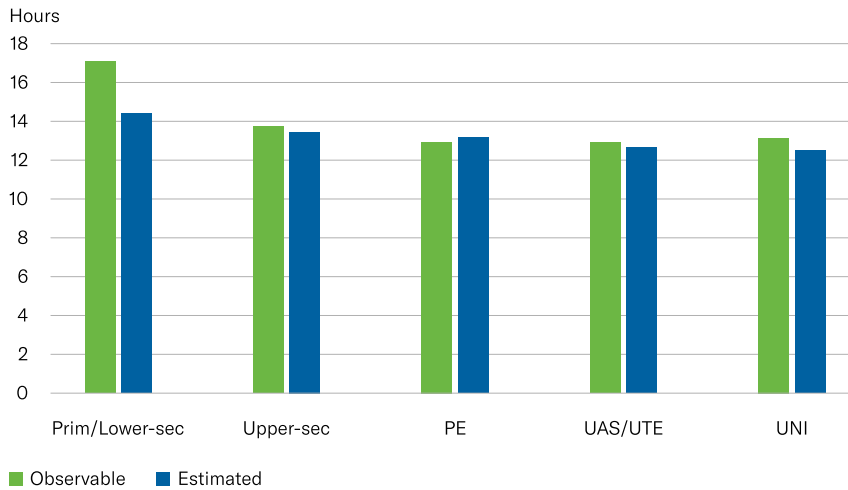
Duration of CET

In order to accurately record the continuing education and training behaviour of the population, it is advisable to take into account not only the participation rate but also the intensity of CET, in other words, how many hours of further training a person takes. The median duration of a continuing education and training activity is 8 hours (first quartile 4 hours, third quartile 16 hours). Only 10% of those surveyed stated that they had completed more than 30 hours of continuing education and training. The difference in the duration of continuing education and training for persons at different educational levels is not great. Only persons without post-compulsory education, but who generally have low participation rates, often have longer periods of continuing education and training when they participate. This is likely due to the fact that unemployed persons taking part in labour market measures more frequently have lower formal qualifications. The values estimated taking employment status into account confirm this assumption (→ Figure 360). Regression analysis shows that unemployment is positively correlated, while age, gender (woman) and family situation (children under 16) are negatively correlated with the duration of continuing education and training.

360 Duration of continuing education and training after completing education

Participation in non-formal education in hours (last 4 weeks), population aged 25 to 64, observed and estimated values controlling for age, gender and education

Data: FSO (SLFS 2016–2023); calculations: SCCRE

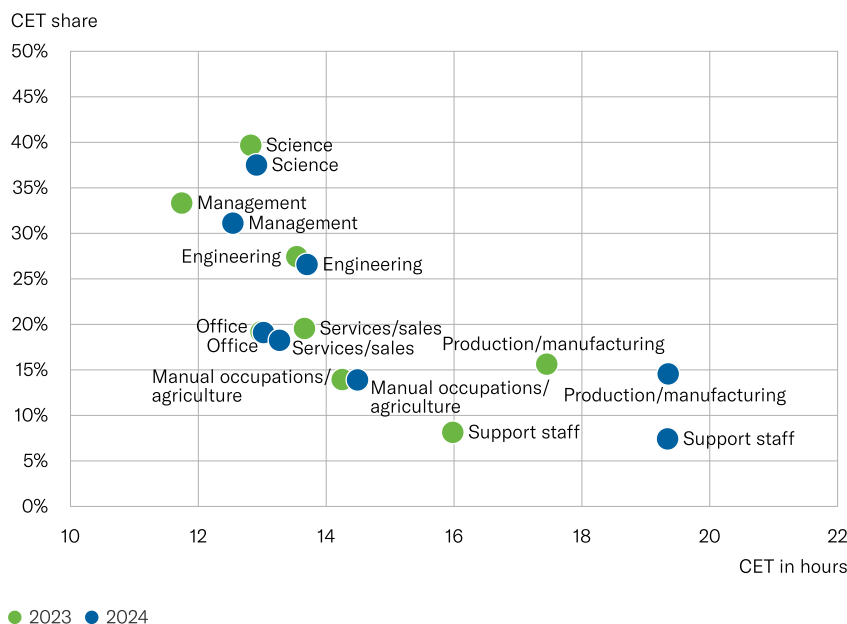


In occupational fields where the gainfully employed participate in continuing education and training more frequently, CET programmes, on average, are shorter. Looking at the development between 2023 and 2024, an opposing trend can be observed across practically all professional groups: While the probability of participation is declining, the duration of continuing education and training is rising slightly (→ Figure 361).

361 Participation and duration of continuing education and training by occupational group, 2023 and 2024

Participation rate and number of hours of non-formal education completed in the last 4 weeks; 25–64-year old population

Data: FSO (SLFS); calculations: SCCRE



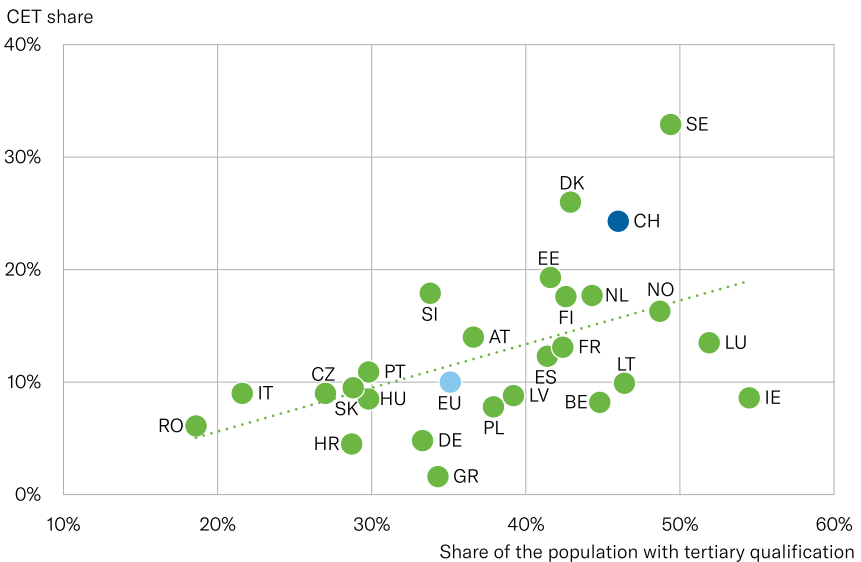
International comparison

Compared to other countries, Switzerland regularly has high rates of continuing education and training, which can be explained not least by its high level of education and a differentiated economic structure. The higher the qualification level of the population and the more knowledge-intensive an economy, the more investments are made in continuing education and training (OECD, 2025). This correlation is shown in Figure 362, in which the rate of continuing education and training is correlated with the share of tertiary-educated persons. The tertiary education rate can explain 30% of the variance in the participation rate. Switzerland is slightly above the trend line with an above-average rate of continuing education and training.

362 Education level of the population and continuing education and training

Tertiary education rate and continuing education and training rate (non-formal education) in the last four weeks, population aged 25–64, 2023

Data: Eurostat (LFS); calculations: SCCRE



Switzerland has above-average continuing education and training rates for persons without post-compulsory qualifications. However, compared to countries where similarly high rates were measured for the entire population (such as Finland or Denmark), Swiss rates for low-skilled workers are low.

Efficiency/costs

The difficulties in assessing CET effectiveness also make it impossible to gauge CET efficiency. The following section therefore covers only the cost side. However, considering costs in isolation does not enable conclusions to be drawn about the benefits or efficiency. Consequently, high costs are not an indication of strong benefits and low costs are not a sign of high efficiency.

Costs of continuing education and training

Participants in CET courses incur both direct (participation fees, course fees, documents, expenses, etc.) and indirect costs. The latter include mainly opportunity costs in the form of forgone income and free time during the continuing education and training. Losses in the form of foregone income are often the biggest cost block, especially for employees whose employers do not support CET and thus the biggest obstacle to attending events for continuing education and training; this fact probably also explains why only a small proportion of job-related continuing education and training is paid privately. Only about 20% of those in employment finance their continuing education and training privately (in other words, by themselves or through family support). At just under three-quarters, employers make the largest contribution to the costs of continuing education and training (→ Figure 363). For job-related continuing education and training, the Federal Statistical Office (FSO) calculated that over 90% of participants were supported by their employer, based on the 2021 microcensus on education and continuing education and training (MET) (FSO, 2024c).

Apart from financial support, employers also make working time available to employees for continuing education and training. Those who can participate in continuing education and training during working hours have significantly lower opportunity costs. Here, too, according to information from those surveyed within the framework of PIAAC, it is apparent that more than two-thirds of continuing education and training takes place during working hours. This ratio does not depend on the educational level of the participants (→ Figure 364). Based on the above-mentioned opportunity costs, it can be assumed that continuing education and training is offered less frequently where employers do not contribute.

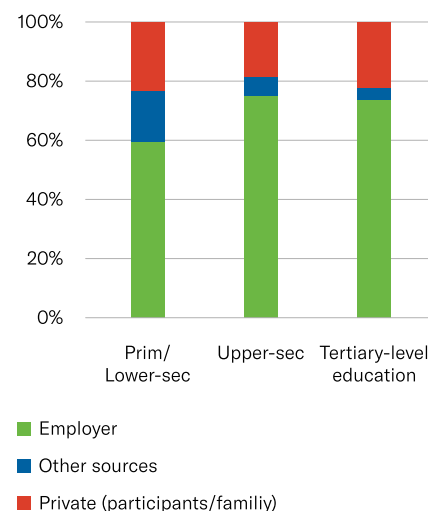
Public funding of continuing education and training

No nationwide statistics on the financial commitment of the cantons exist, which is why it is not possible to compile an overview. The Continuing Education and Training Act (CETA) aims to better coordinate the existing measures between the federal government and the cantons. In addition, the federal government can contribute to cantons by funding measures and programmes so that adults can acquire and maintain basic skills. These contributions are a form of subsidisation for continuing education and training. In addition, the federal government makes contributions to national organisations for continuing education and training for measures to raise awareness or to ensure quality. In 2021, CHF 11.5 million was paid out on

363 Funding of continuing education and training after completing education

Funding of the direct costs of participants in non-formal education activities by source of finance, 25–64-year olds in employment, 2023

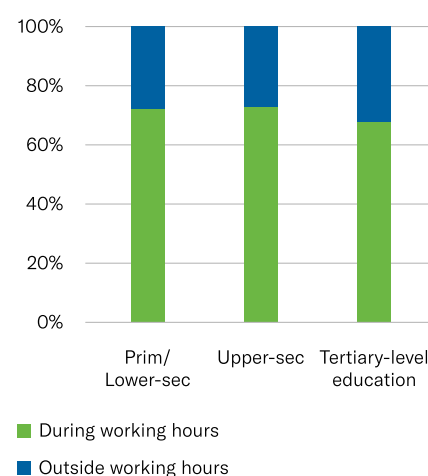
Data: OECD (PIAAC); calculations: SCCRE



364 Temporal framework for continuing education and training

Time of implementation of continuing education and training, employed population aged 25–64, 2023

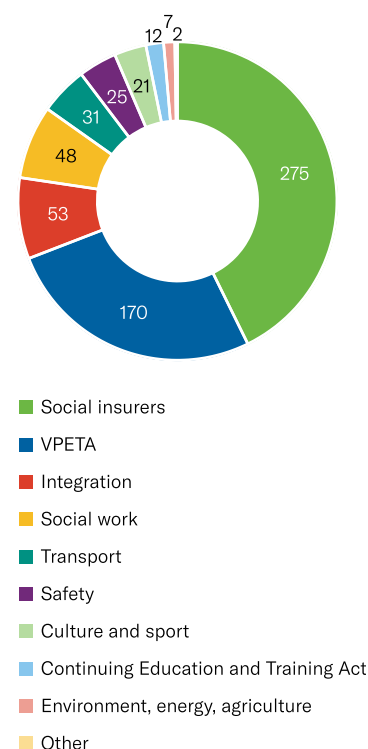
Data: OECD (PIAAC); calculations: SCCRE



365 Expenditure by the federal government and social insurers for continuing education and training, 2021

Figures in CHF million

Data: SERI; calculations: SCCRE



VPETA Federal Vocational and Professional Education and Training Act

the basis of the Continuing Education and Training Act. Overall, however, the federal government and social insurance funds spend significantly more money on continuing education and training (→ Figure 365). A good quarter of the total federal resources for continuing education and training is paid through the Federal Vocational and Professional Education and Training Act (VPETA)⁸. Most of this goes towards subsidising preparatory courses for professional education examinations (→ *chapter Professional education, page 303*). Almost half of the federal government's funds are used for measures under unemployment insurance to help job-seekers find work and for measures under disability insurance to assist others with re-training and integration. The remaining part of federal funding is used for specific continuing education and training measures on the basis of a number of other federal laws (→ Figure 365).

The federal government and the cantons cooperate to promote basic skills. To this end, cantonal programmes promoting basic skills in mathematics, reading, writing, the local language or information technologies are subsidised by the federal government with up to a maximum of 50% of the total costs (SERI, 2025). These funds cover the cost of courses as well as accompanying measures (coordination, administration, awareness building, counselling, etc.). The federal government is also providing subsidies with the funding priority “Simply better! ... at the workplace” for short, continuing education and training courses offered by companies and trade associations to promote basic skills. These continuing education and training courses focus both on maintaining employability and on combating the shortage of skilled workers.

CET over the course of employment

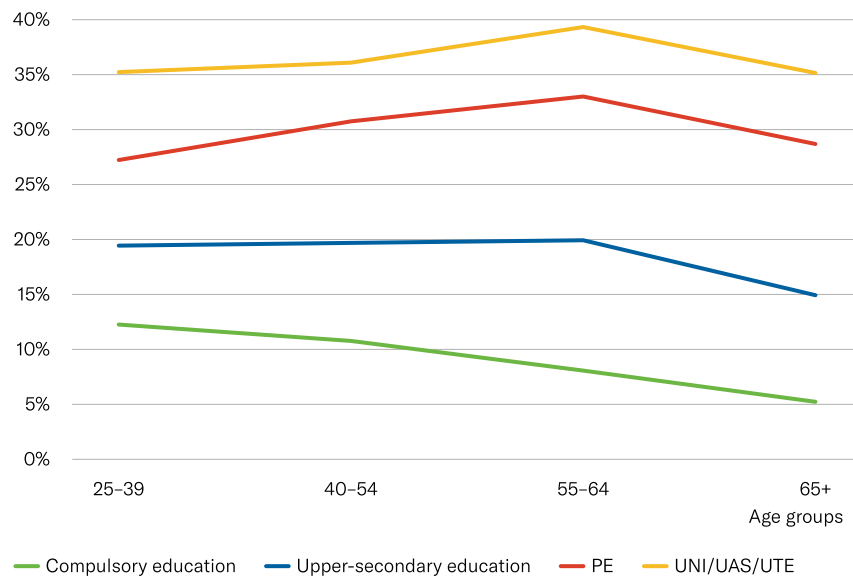
CET activity tends to decline with increasing age. When differentiated by education level, the picture is heterogeneous: Amongst persons with tertiary education (diploma from professional education institutions or graduated from universities), the participation rate continues to increase from the age of 25 and only declines sharply after retirement. Persons with post-compulsory education demonstrate stable CET behaviour until retirement; for persons without post-compulsory education, participation in continuing education and training declines sharply with age (→ Figure 366).

⁸ Federal Act on Vocational and Professional Education and Training (VPETA) of 13 December 2002.

366 Continuing education and training rates by age group

Participation in continuing education and training in the last four weeks by highest educational qualification and age; mean values for the years 2023 and 2024

Data: FSO (SLFS); calculations: SCCRE



The overall higher continuing education and training activities amongst persons with a tertiary education can also be explained by the fact that university graduates, unlike those with a vocational qualification, only start acquiring job-specific skills after entering the labour market. Wage trend analyses also show that labour productivity in Switzerland tends to decline from the age of 45 and that further investments in human capital are needed to offset the decline, in particular amongst those over the age of 50. This is due to the fact that their formal education dates back so far that the depreciation of human capital is steadily increasing. However, the effect of this depreciation is likely to be so significant with age that the latter can barely be compensated by continuing education and training (*→ margin text*). This is offset by the fact that the opportunity costs increase with age. At the same time, the period during which the costs of continuing education and training can be offset by higher benefits is becoming shorter. In effect, this leads to a substantial depreciation of knowledge and skills amongst those in tertiary-qualified employment from the middle of their professional career. This means that the higher the qualification, the greater the depreciation.

Depreciation of human capital

How much continuing education and training would theoretically be required to compensate for the average depreciation of human capital of a person with a university degree? The following calculation example can be used as an estimation: Assuming a total of 9,000 hours of formal education for a university degree and a depreciation of this human capital of 3.5% per year, this corresponds to an annual depreciation of knowledge equivalent to a good 300 hours of formal education, which would have to be compensated by continuing education and training. This is offset by an anticipated value of 5 hours of continuing education and training for all persons with a tertiary education in Switzerland (on average 12 hours of continuing education and training with a participation rate of 40%). In other words, five hours of continuing education and training currently compensates for just 1.5% of the annual loss of knowledge. The remaining 98.5% would theoretically need to be covered by on-the-job training, which is almost impossible. Empirical studies assume a maximum of 50% of human capital depreciation that could be offset by on-the-job training (Autor, 2014).

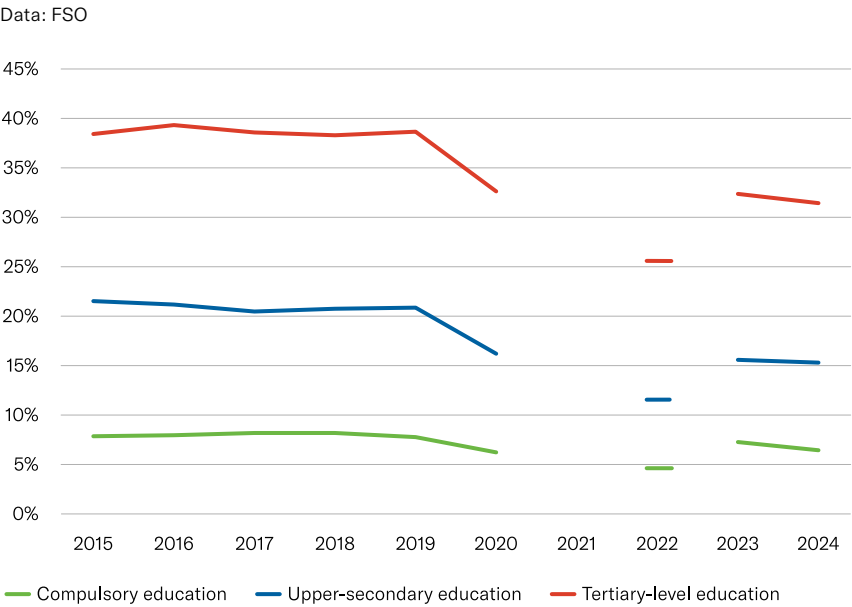
Equity

Educational disparity

Participation in continuing education and training depends on the level of education. The higher the formal education qualification, the greater the probability of continuing education and training (→ Figure 367). Persons with a low level of education are more likely to spend longer periods without continuing education and training (FSO, 2024u). The major differences relating to participation in continuing education and training after completing the highest level of education have repeatedly given rise to discussions about equity in CET.

367 Continuing education rate by education level, 2015–2024

Participation in non-formal education, resident population aged 25–75; 2021, 2023: Break in the time series due to adjustment of the survey method and the survey instrument



2021: Break in the time series due to adjustment of the survey method and instrument; the results will not be published.
2022: A change to the questionnaire in 2021 causes a decline in values.
2023: A new change to the questionnaire leads to an increase in values.

However, whether this in fact constitutes an equity problem, in other words, whether those with a lower level of formal education exploit their skills potential less well than persons with a higher level of formal education, cannot be answered conclusively. The reasons for the differences in participation rates are also hard to determine. It is therefore unclear, for example, how much the difference in participation in a continuing education and training activity is due to the fact that the access barriers to those with lower educational qualifications are higher than for those with a strong educational background. It is also unclear whether different educational preferences could be the cause of the differences. The fact that skills acquired

during formal education lose their value over time suggests that those with higher levels of education will need to invest more in continuing education and training to be able to remain at the same level of skills relative to the skills required in the profession than persons with a lower formal education level (→ *chapter Cumulative effects*, page 347).

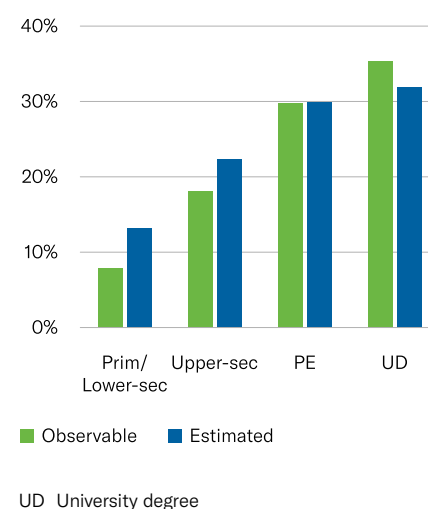
If characteristics such as age, gender, occupation and labour market status are controlled for in the data analysis, there are smaller differences in CET rates between the education groups (→ Figure 368). The advantage of persons with a university degree over those without a post-compulsory qualification (odds ratio) is then reduced by more than half to around a factor of 2. This is due to the fact that it is not only formal education that has an effect on participation in continuing education and training, but also numerous other personal or professional factors.

In terms of the educational disparity amongst groups with various levels of formal education, Switzerland is only average compared to other countries (→ Figure 369). In Switzerland, tertiary-educated persons have a major advantage when it comes to accessing continuing education and training compared to low-skilled persons without post-compulsory education: The probability of completing continuing education and training is greater by a factor of 4 (odds ratio) for the former. The situation in most countries has improved compared to previous years to the effect that the advantage of highly-skilled persons has diminished. This is mainly due to the fact that the decline since the pandemic has been more pronounced amongst the more highly educated, and not to the fact that the continuing education and training rate of persons with low qualifications has increased.

368 Participation in continuing education and training after completion of education

Participation in non-formal education in the last 4 weeks, 25–64 year olds in employment; observed and estimated values controlling for gender, age, education and labour market characteristics

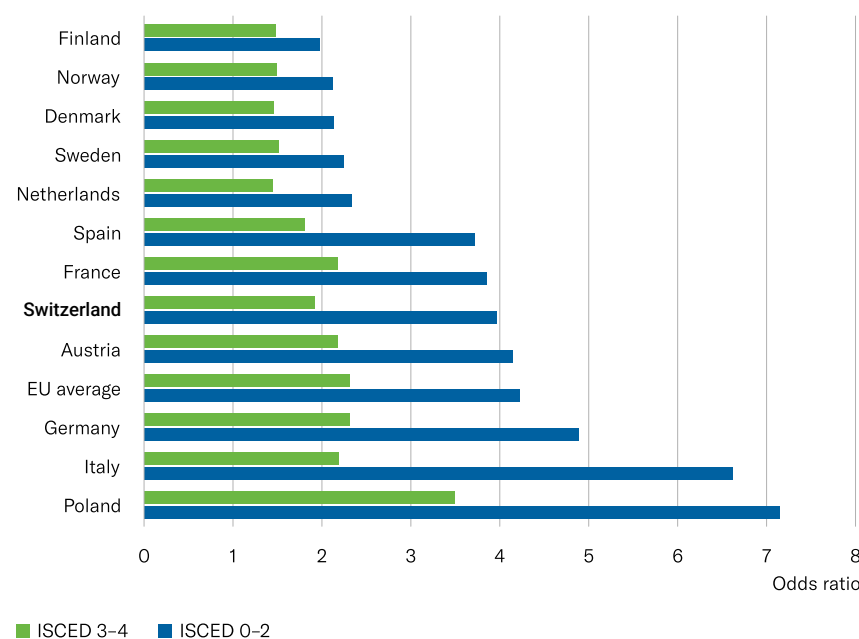
Data: FSO (SFLS 2016–2023); calculations: SCCRE



369 International comparison of educational disparity, 2023

Advantage of participation in continuing education and training for persons with a tertiary education compared to persons without a post-compulsory education (blue bars) and persons with an upper-secondary level qualification (green bars); non-formal education, last 4 weeks, 25–64-year-olds

Data: Eurostat (LFS); calculations: SCCRE

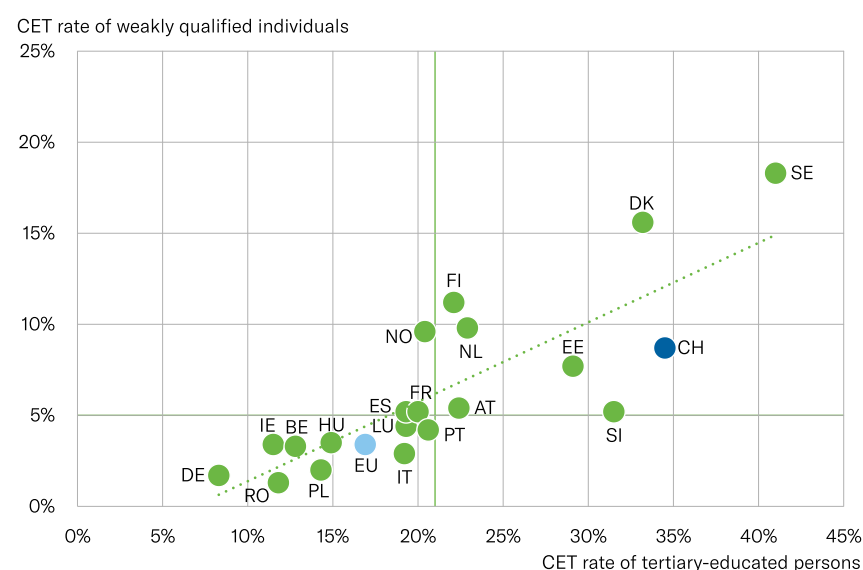


A comparison of the absolute rates for the various educational groups shows that Switzerland is even above the European medium with the participation rates of low-skilled persons. Compared to the CET rate of the population as a whole, it can be said that their participation is below average, while that of highly qualified persons is above average, explaining the large disparity. In Germany, on the other hand, despite a smaller disparity between the educational groups, these all take part in continuing education and training significantly less often (→ Figure 370).

370 International comparison of continuing education and training rates, 2023

Participation rates in non-formal education (last 4 weeks) of low-skilled persons (y axis) and those with tertiary education (x axis); population aged 25–64; green axes: EU average

Data: Eurostat (LFS); calculations: SCCRE



Continuing education and training in the event of impairments

Under the Federal Act on the Elimination of Discrimination against Persons with Disabilities (BehiG)⁹, those with disabilities should have equal access to CET offers. Based on data from existing surveys, it can be said that persons with disabilities are underrepresented amongst participants in continuing education and training courses (FSO, 2022c).

Based on the Swiss Labour Force Survey (SLFS), which contains information on the degree of health impairments, the extent to which persons with health impairments experience a disadvantage when it comes to attending a continuing education and training event can be determined. Analysis of the data shows that persons with slight disabilities take part in continuing education and training less often; amongst persons with severe disabilities the participation rate is reduced by more than half (→ Figure 371). Comparable observations can also be made based on the microcensus (FSO,

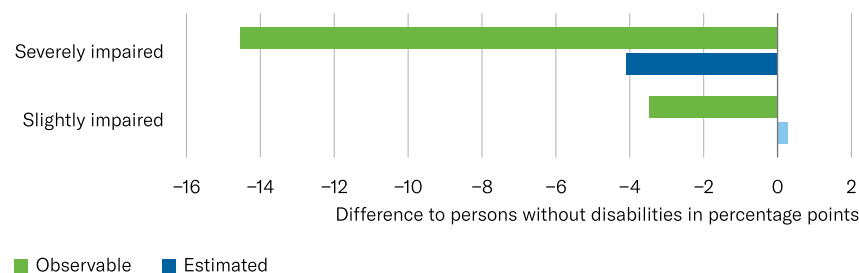
⁹ Federal Act on the Elimination of Discrimination against Persons with Disabilities (Disability Discrimination Act), of 13 December 2002.

2024u). There is no information about the reasons for the gaps in participation ratios. If influencing variables relevant for regression analysis are taken into account in the analysis, the observed disadvantage is significantly reduced: for the same age, gender, educational attainment and employment status, the disadvantage disappears for persons with slight disabilities compared to persons without disabilities, and for those with severe disabilities, the disadvantage is reduced to less than 4 percentage points.

371 Disability and continuing education and training

Participation in non-formal education (last 4 weeks) by degree of disability, 2023; population aged 25–64; difference to persons without disabilities; blue bars: estimated values for same age, gender, educational attainment and employment status; light color: no significant difference

Data: FSO (SLFS); calculations: SCCRE



While continuing education and training organisations ascribe a high level of importance to inclusion and digitisation, digital technologies that could improve the participation of persons with disabilities are often lacking. According to a recent national survey, there is a lack of holistic concepts for digital accessibility and the provision of barrier-free teaching content (Steiner & Kaiser, 2024).

CUMULATIVE EFFECTS

Non-cognitive skills¹ include personality traits and social competences, but there are no uniform definitions, concepts or methods to measure them (Duckworth & Yeager, 2015). They include skills that are not attributed to intelligence or cognitive processes. Mal-leable non-cognitive skills are particularly relevant in education, as they can complement the skills taught in schools. The five-factor model, known as the Big Five (Goldberg, 1990), describes personality in terms of extroversion, agreeableness, conscientiousness, openness and neuroticism. The HEXACO model (Ashton & Lee, 2007) is similar to the Big Five but also includes the dimension of honesty-humility. Other characteristics include competitive tendency (Niederle & Vesterlund, 2007), grit (Duckworth, 2016), executive functions, and a belief in control and the need for cognition (Liu & Nesbit, 2024; Strobel et al., 2024). Although these characteristics are relatively stable, they can change over the course of someone's life and are influenced by how the measurement is applied.

Introduction

In the context of education, “cumulative effects” can take on a range of meanings, which are explained in detail in this chapter. Firstly, cumulative effects include all investments in education and the acquisition of skills throughout the educational path. Secondly, they relate to learning in school as well as outside of other formal educational paths. Thirdly, the term refers not only to an increase in skills but also to the returns from education for individuals and society cumulatively. Fourthly, there are also monetary and non-monetary effects. The chapter builds on earlier educational reports, while also focusing on new research findings and avoiding studies that have already been cited. The literature used comes mainly from publications after 2020, except for topics not covered in previous reports. Finally, the acquisition of cognitive and non-cognitive skills through genetic inheritance is included as a new topic.

Cognitive and non-cognitive skills

The acquisition of cognitive and non-cognitive skills begins already before formal schooling and is a lifelong process influenced by genes as well as by the home and the social and personal environment the child grows up in (Duncan et al., 2023; Eshaghnia et al., 2024; Kawano et al., 2024). The following sections discuss these key determinants based on new findings from the literature.

Environmental influences and the development of abilities

Environmental factors start to have an effect already during pregnancy. For example, prenatal stress – such as physical or psychological violence against the mother – can have a negative effect on a child's health (Currie et al., 2022; Turk et al., 2023). Furthermore, the mother's behaviour, such as nutritional habits or use of toxic substances, during pregnancy can also affect a child's health. Other factors include environmental or noise pollution, which can also affect a child's health (Simeonova et al., 2021) and determine future outcomes directly. For these reasons, there are some indications that health and nutrition programmes for mothers and young children have a positive effect on children's health and educational outcomes (Chorniy et al., 2020; Kitzman et al., 2019).

Environmental influences also play a major role in development after birth (Bühler, Schaltegger et al., 2024). Children from low-income backgrounds, for example, often grow up with a lack of stimulation and basic parental attention and care, leading to developmental deficits (Attanasio et al., 2022; Rodcharoen et al., 2024; Toppeta et al., 2024). These disadvantages generally start to play a role only in the later stages of development and education (Neuenschwander et al., 2022). The family environment, which is difficult to change, is a key determining factor in whether and how a child's cognitive and non-cognitive abilities develop. However, some influencing

1 The terms “abilities” and “skills” are used synonymously in this chapter.

factors in the form of interventions and complementary activities can make a positive difference here. Programmes, such as early childhood education and care² or mentoring for children, can help to even out primarily family-related differences in how children perform when they start school or during their time in school (*Attanasio et al., 2022; Berne et al., 2024; Dougan et al., 2023; Drange & Sandsør, 2024; Emmers et al., 2022; Figlio et al., 2023; García & Heckman, 2023; Kosse et al., 2024; Resnjanskij et al., 2024*). There are even indications that these measures also positively affect siblings and other children in the immediate surroundings (*Bennhoff et al., 2024; García et al., 2023; List et al., 2023*). However, the positive effect on cognitive and non-cognitive skills does not always relate directly to monetary transfers made to disadvantaged families (*Noble et al., 2025*).

Although there is often a strong correlation between the degrees to which cognitive and non-cognitive skills develop (*Belfi & Borghans, 2025*), it is not always clear whether this is due to the influence of one determining factor or the simultaneous influence of several determining factors on both these skills, or whether these skills influence each other (*Barabasch et al., 2024; Cobb-Clark et al., 2025; Miyamoto et al., 2024; Sorrenti et al., 2025*). Empirical evidence suggests that both single and multiple factors are involved. For example, a good family setting can simultaneously result in motivation as a non-cognitive ability and develop a child's cognitive abilities in the form of reading a skill. At the same time, weak cognitive skills can reinforce less desirable personality traits, while weak non-cognitive skills can interfere with performance in school at a later stage. Based on research published so far, it can generally be said that non-cognitive skills usually also call for some form of cognition, while cognitive tasks, on the other hand, are facilitated or enabled to a significant degree through non-cognitive skills (*Albiez et al., 2025; Buser, Niederle et al., 2024*).

During schooling, other learners also decisively influence the development of both cognitive and non-cognitive abilities, in addition to educational institutions, teachers and the parents (*Fairlie et al., 2024*). These peer effects can in turn arise from both cognitive and non-cognitive abilities or from the behaviour of other learners (*Adamopoulou et al., 2024; Goller et al., 2023; Golsteyn et al., 2021; Lent, 2024; Shan & Zölitz, 2025; van Lent, 2025*). Even though the influence of peers increases with age and is strongest during adolescence (*Lenard & Silliman, 2025*), there is empirical evidence that it already plays a role in early childhood (*Diebold et al., 2023*) and that the effect can vary depending on the social background (*Adamopoulou et al., 2024; Goulas et al., 2024*).

The culture that a child grows up with or the values that the parents pass on can also influence that child's development. Studies have shown that differences in time preferences and the willingness to take risk can considerably influence a child's success in education (*Hanushek et al., 2021; Hanushek et al., 2023; Sunde et al., 2022*). For example, there is evidence that learners from cultures with a long-term orientation have better reading and maths scores and test results over time, have fewer absences and disciplinary problems, have to repeat classes less often, take advanced courses more often, and are more likely to finish secondary education (*Figlio et al., 2019*) than learners from cultures with a short-term orientation. In addition, learners from

The Swiss long-term ZEPPELIN study shows that the **home visit programme** "PAT – learn with parents" continues to have a positive effect three years after the end of the intervention: Children have better German and maths skills, more control over their impulses, and fewer behavioural problems (*Schaub et al., 2021; Lanfranchi & Steinegger, 2023*). Similar approaches to the SCALA project help teachers to specifically support disadvantaged learners through CET education and coaching (*Kassis et al., 2022*).

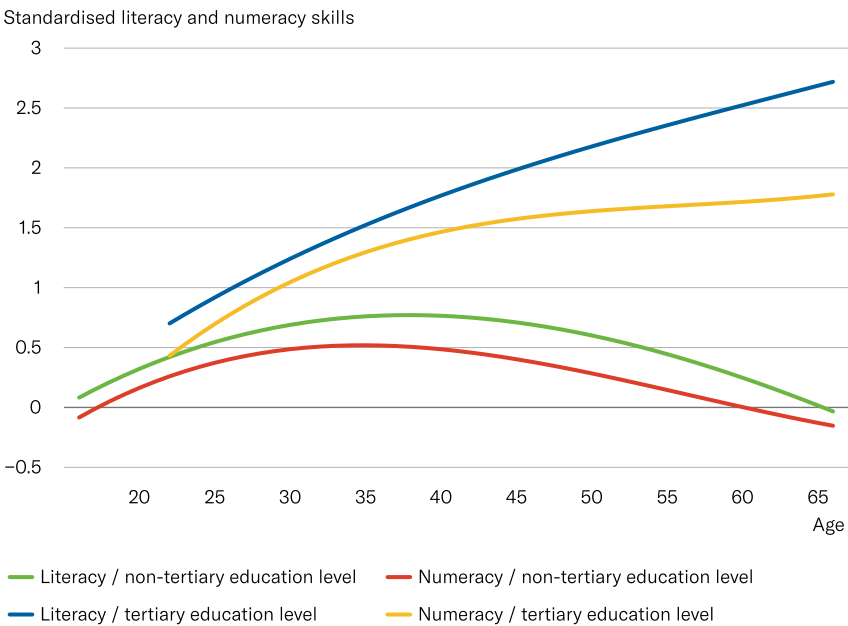
² For an overview of early childhood programmes, see *Baulos et al. (2024), Dadisman et al. (2024), Duncan et al. (2023), García & Heckman (2023), Heckman et al. (2024)*.

more individualistic cultures have stronger cognitive abilities and gain more qualifications over time, and they make a greater effort to develop their abilities as they spend more years in school and are more likely to participate in adult education programmes (Hartinger et al., 2021).

Finally, the level of education also determines the range of abilities that learners acquire over time. Figure 372 illustrates the effects of educational level on abilities over time.

372 Literacy and numeracy skills by age and educational level

Data: Hanushek et al. (2025)



Reading example

The graph shows the cumulative marginal changes in standardised literacy and numeracy skills. Literacy skills at age 40 and with a tertiary educational background (value 1.77) are about one standard deviation higher than those with a non-tertiary educational background at the same age (value 0.77).

Genetic factors and the development of skills

As described in the previous section, various environmental factors influence the acquisition of cognitive and non-cognitive skills. There is also increasing evidence that some of these skills are at least partially hereditary (Plomin & von Stumm, 2018; Polderman et al., 2015; Turkheimer, 2000). Various studies argue that abilities and talents important for later life develop already before birth. Children are born with different cognitive and non-cognitive skills with which they acquire knowledge, skills and attitudes – referred to as “human capital.” A person’s genes determine the potential of developing skills successfully, while the environment influences the extent to which this potential can unfold. Analyses show, for example, that 75% of people in the top 10% of the distribution of the educational attainment polygenic index attend a university, while only 25% in the bottom 10% do so (Plomin & von Stumm, 2022).

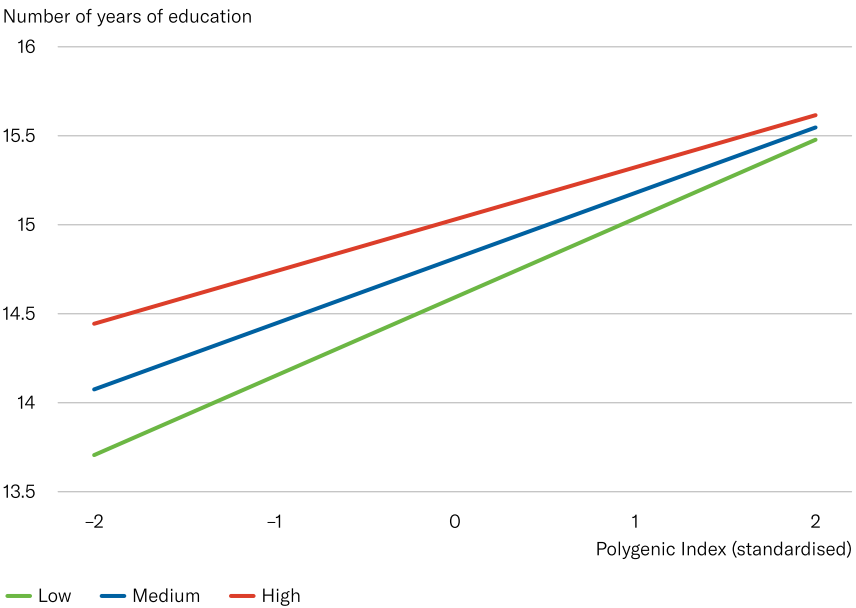
Rising educational opportunities and declining economic and gender-related inequalities have strengthened the association between genetics and academic outcomes (Herd et al., 2019; Pettersson, 2023).

A range of factors need to be considered when trying to assess the effect of genes on education. Firstly, the genetic variants captured in a genetic index are rarely the sole factors influencing the personality trait as represented in that index. Many genes affect several traits and are therefore included in several indices. In particular, it has been shown that the same genes can partly influence the various cognitive abilities and personality traits (Becker et al., 2021). Secondly, the results may be subject to environmental influences (Conley et al., 2015; Merz et al., 2022). Genetic influences are complex and linked with various non-genetic factors such as family traits, socio-economic background and the environment (Turkheimer et al., 2003). For example, behavioural geneticists have found that a supportive family environment and similar genetic predisposition complement each other (Arpawong et al., 2023; Turkheimer, 2000; Woodley Of Menie et al., 2021), an outcome often referred to as the Scarr-Rowe effect. In addition, studies suggest that genetic variants associated with cognitive abilities have a greater effect on educational outcomes among individuals with a stronger socio-economic background (Buser, Ahlskog et al., 2024; Figlio et al., 2017; Guo et al., 2022; Papageorge & Thom, 2020; Ronda et al., 2022). Early childhood interventions and the quality of the school (→ Figure 373) can also enhance or weaken the effect of genes (Arold et al., 2022; Attanasio et al., 2025; Cheesman et al., 2022; Cheesman et al., 2025; Stienstra et al., 2024).

Genes are the basic units of heredity, which consist of DNA and encode the instructions for building and regulating the development and functions of the body. Genes are inherited from both parents and together influence a wide range of traits. Each person has about 20,000 to 25,000 genes, and slight variations of these contribute to individual differences. However, complex traits are usually influenced by many individual genetic variants (Chabris et al., 2015). A polygenic index (PGI), also known as a polygenic score, summarises these small correlations between individual genetic markers and a specific trait into a number that can be seen as an individual’s genetic tendency towards that trait. Researchers calculate PGIs using data from genome-wide association studies (GWAS). This report especially relies on the Educational Attainment Polygenic Index (EA PGI) (Lee et al., 2018; Okbay et al., 2022). EA PGIs have been consistently associated with academic performance and cognitive abilities of children and adolescents. Studies of twins and DNA have also shown that individual differences in educational characteristics, such as time spent in education (Lee et al., 2018) and general cognitive function (Davies et al., 2018), are hereditary.

373 Association between the polygenic index and years in education, by school quality

Data: Arold et al. (2022)



Reading example

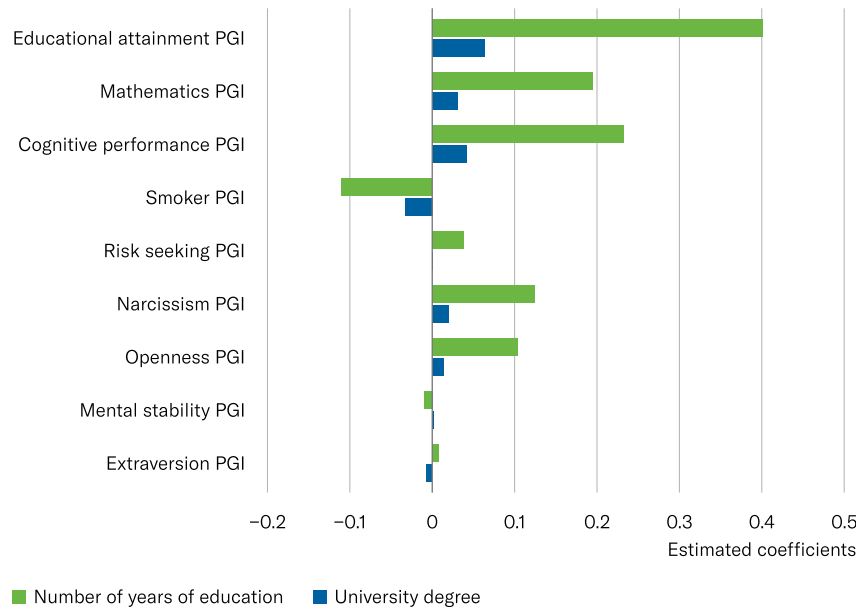
With an average polygenic index (value 0), the predicted number of years in education with an average school quality is around 14.8. With two standard deviations below the average polygenic index (value -2 on the horizontal axis), the predicted number of years in education is only slightly more than 14, with a moderate school quality. If the quality is high (standard deviation above the mean), the predicted number of years in education is just under 14.5 years in education. The differences among years in education based on teaching staff quality become smaller with a higher polygenic index.

Research studies have attempted to overcome this problem by using a variety of strategies, including data sets on siblings, twins and adopted children (Arold et al., 2022; Buser, Ahlskog et al., 2024; Stienstra et al., 2024). One study focused on the relationship between genes and educational attainment based on a dataset on twins in Sweden. The results show that genetic variants associated with higher cognitive abilities, openness and narcissism can predict the number of years in education and the probability of a successful university degree, even after controlling for different family traits. This is particularly true for polygenic indices (PGIs) for education, mathematics and cognitive subjects, but also for some personality traits (Buser, Ahlskog et al., 2024) (→ Figure 374).

374 Influence of polygenic indices on educational outcomes

Results of the estimated impact of different PGIs on educational variables among twins in Sweden

Data: Buser, Ahlskog et al. (2024)



The figures show the estimated coefficients from individual regressions of education variables (number of school years and binary indicator for university degree) on the displayed PGIs. A value of 0.1 for years in education means that a PGI value higher by one standard deviation increases the number of years in education by 0.1. If the figure for a university degree is 0.05, there is a 5 percentage points higher probability of obtaining a university degree.

Thirdly, variances in the results among genetically different populations can be attributed to non-genetic factors such as cultural norms, politics, geographical environments or economic circumstances, which can give a biased impression (Hamer & Sirota, 2000).

These advances improve the understanding of the intergenerational transfer of educational success and the question relevant for educational policy about how much can be attributed to genetics and how much to the environment. Studies of siblings show that 20% to 45% of the similarity in educational outcomes among them can be attributed to genetics and the rest to environmental factors (Fletcher et al., 2023; Silventoinen et al., 2020). Parental genetics can directly affect a child's educational outcomes through genes that are passed on or indirectly via the environment (Cawley et al., 2023; Demange et al., 2022; Wang et al., 2021). For example, there is evidence that parents' genetic indices for cognition will influence their children's general intelligence and executive functions through their genetic indices (genetic pathway) and through parental upbringing (phenotypic pathway). Similar results were found for non-cognitive skills, for reading and writing skills, for verbal skills (Axelrud et al., 2023; Guo et al., 2022), for parental non-cognitive skills, and for children's educational attainment (Demange et al., 2022).

The monetary benefit of education

A person benefits monetarily from education when the acquisition of skills has an impact on this person's material well-being, for example in the form of a higher probability of entering the labour market or becoming gainfully employed with better pay. When applied to society as a whole, the collective acquisition of skills determines a country's competitiveness and thus the growth and performance of its economy. Ultimately, a country and society will benefit when people with better and longer education earn higher incomes and thus generate higher tax revenue. These, in turn, serve as a basis for public investment in education and other areas and relieve the burden on the social system by reducing the reliance on social transfer payments.

Employment

A study for Switzerland has shown that one in four gainfully employed persons with a university degree and one in three gainfully employed and qualified professional educators are likely to compete with an **AI**. But these people will be able to benefit more from AI through its complementary use. On the other hand, people without further education will be less affected, but can hardly use AI to their advantage (Schnell & Salvi, 2024).

A study on the effects of AI in the service sector analysed data from Japanese nursing homes and the robots they use. The results show that the **use of robots** is associated with an increase in employment and employee retention. Complementarity with nursing staff is particularly pronounced in the case of monitoring robots. With the introduction of new robot types, the proportion of tasks these robots carry out increases, leading to a redistribution of nursing staff activities and a higher quality of care (Lee et al., 2025).

The effect of education on the probability that a person participates in the labour market manifests itself in various forms. Firstly, persons with a better education are more likely to find a job in the first place. Secondly, people may choose to forgo employment voluntarily even when job vacancies exist. Depending on the social system and family status, the probability of someone choosing not to work may be stronger in the case of a lower education level because this would involve only jobs with low wages and relatively poor working conditions. Conversely, higher education can lead to a wage level that allows the person to substitute working time at least in part with leisure time. Thirdly, skills devalue over time, and thus the risk of unemployment may depend on the speed of this process. However, the question of which form or level of education is especially affected by the risk of such devaluation still raises some questions. Even though there are studies showing that dual vocational education and training enables young people to integrate more quickly into the labour market (Bolli et al., 2021), people with a VET background are most affected by the “scars” after a period of unemployment (Shi & Di Stasio, 2022). This can be mitigated if the job-specific demand for labour is high and workers are trained in occupations that call for a high proportion of job-specific skills. However, such workers may be at a higher risk of losing status on becoming unemployed than those trained in occupations where general skills are more important (Hänni & Kriesi, 2025). In addition, the skills of persons with a VET background tend to become obsolete earlier in their working life (Hanushek et al., 2017).

The acquisition and development of skills through lifelong learning plays an important role in countering the devaluation and obsolescence of a person's qualifications and in reducing the risk of unemployment (Denzler et al., 2025; Falck et al., 2024; Rupieper & Thomsen, 2025; Schultheiss & Backes-Gellner, 2023). Until recently, for example, it was assumed that people with higher degrees would be better protected against digitalisation and technological progress. Current trends in AI, however, have changed this (Acemoglu et al., 2022; Aum & Shin, 2025). While computers and industrial robots are mostly replacing low-skilled workers and routine tasks while increasing demand for high-skilled workers (Pusterla & Renold, 2022), AI is now starting to carry out the tasks of high-skilled workers (Eloundou et al., 2024; Hui et al., 2024). It is no longer clear how AI will affect complementary processes and task allocations within a job (Hoffmann et al., 2024).

Wages

Differences in education affect not only the probability of whether a person works but also the wages this person will earn (*Deming & Silliman, 2025*). Educational wage differences can, on the one hand, be explained by differences in the productivity of people at different educational levels. This is not just about productivity relating to a specific activity but also about whether complex or frequently changing tasks can be completed more effectively (*Deming, 2023*). A person's productivity is usually difficult to observe before starting a job, which is why employers use the level of education (*Spence, 1973*) or other educational achievements as an indicator (*Busso et al., 2023; Stans et al., 2025*). This indicator leads not only to different wage offers but is also increasingly used as a means with which to gauge whether an applicant should be considered in the first place. On the other hand, education-related wage differences can arise if, due to the levels of technology used, more productive jobs tend to be given to more highly qualified workers. This is because highly qualified people are not only more productive than low-skilled ones but can also perform more complex tasks.

As with employment, technological advances, and AI in particular, are changing the wage structure in the labour market. Developments are transforming tasks at the level of the professions for which appropriate skills are required, and thus also the remuneration for these skills (*Bloom et al., 2025; Caplin et al., 2024; Stephany & Teutloff, 2024*). Studies have shown that the wage premium for digital skills has risen continuously (*Langer & Wiederhold, 2023*) and that data science skills are dynamically rewarded (*Josten et al., 2024*). In Switzerland, highly specialised professions are benefiting from the digital transformation: Wages increase in these professions, which is not the case for more general professions (*Kiener et al., 2024*). Continuing education and training make a decisive difference (*Falck et al., 2024*).

Switzerland, on average, has salary advantages of 7.5% to 8.5% per additional year of education (→ Figure 375). At 8%, this means, for example, that a person with a Master's degree (five additional years in education) can expect an average salary advantage of around 40% in each year of employment when compared to someone who enters the labour market with a baccalaureate and no further education. This estimated average return on education has been subject to cyclical fluctuations over the past two decades but has remained relatively stable overall. In other words: The general rise in education level among the working population has not led to an oversupply of educated minds that would erode the profitability of this investment for the individual person (→ *chapter Tertiary-level education, page 189*).³ However, the average return fails to take relatively high heterogeneity into account. When calculating the returns on education for those among the lowest earners (1st wage decile) and for those among the highest earners (9th wage decile) and then juxtaposing these returns as a ratio, it becomes apparent that the returns are always significantly higher at the top of the wage distribution. This difference in favour of the highest earners, regardless of education level, has increased from around 20% to around 100% since 1990,

The salary for the education and training a person receives may also depend on the subject (*Altonji & Zhu, 2025*) and the type of qualification (*Eggenberger & Backes-Gellner, 2023; Hanks et al., 2024; Kiener et al., 2024*). Educational attainment and the overall **bundle of skills** influence wages, whereby these skills are linked to investments in human capital, such as education and work experience. A study using data from graduates in the USA on LinkedIn has shown that more experienced and highly educated workers have a greater share of job-specific skills, which is consistent with their acquisition through degree programmes and work experience. Workers who claim to have specific or managerial skills are more likely to find well-paid jobs (*Dorn et al., 2025*).

3 Some studies have found that the returns from cognitive skills have declined over time, despite an increase in demand for workers with a university degree (*Edin et al., 2022; Izadi & Tuhkuri, 2024*). However, the apparent decline in returns can be attributed to a cohort effect and the associated changes in the distribution of skills between the cohorts (*Hellerstein et al., 2024*).

Wage advantages due to an increasing number of years in formal education are referred to as **private return to education**. Identifying the causal effects of education on wages has remained a challenge since the first calculations in the late 1950s, because the selection of more talented individuals into longer education and training periods and into higher-wage jobs tends to distort and overestimate the return on education.

i.e. the return on education has doubled. After that, however, the advantage decreased again and levelled off at around 50%.

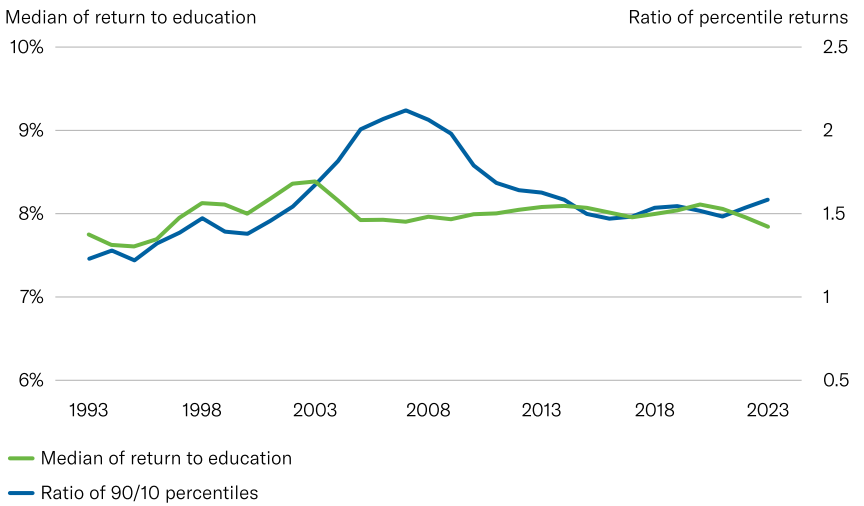
This comparison shows two important aspects of the returns to education: Firstly, investments in education are much more worthwhile for the more productive individuals than for the lowest earners at every education level. Secondly, the return risk increases as education increases, because wage distribution increases with education level. The average return thus becomes less and less meaningful as education levels increase.

In contrast to individuals without post-compulsory education, the returns on education per year of education are on average around 15% to 20% higher for individuals with an upper-secondary qualification and around 45% to 50% higher for individuals with a tertiary qualification. While these differences are slightly higher than in the 1990s, they have remained relatively constant over the past decade.⁴

375 Return to one additional year of education

Returns to education for median income and the relationship between the returns to education at the first and ninth deciles. The figure reflects moving averages over three years.

Data: FSO (SLFS); calculations: SCCRE



When interpreting time series based on SLFS data, it is important to remember that from 1991 to 2009 data was collected in the second quarter of each year and from 2010 onwards it was collected quarterly as a continuous survey. In 2021, the SLFS was also changed from a phone-only survey to a multi-mode online one using a revised questionnaire. These changes led to breaks in the time series, which can at least partially influence the results.

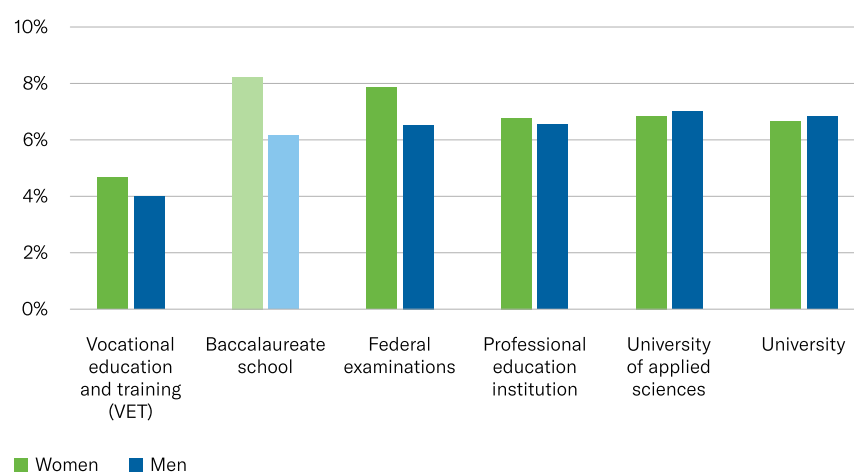
When interpreting such figures, it is important to note that persons with a secondary education qualification and those with a tertiary qualification have different durations for education and training. The calculation of wage differences per additional school year (→ Figure 376) shows that persons with a tertiary degree (university or university of applied sciences) earn

4 Calculations of returns on education for the years 2011–2022 based on surveys conducted before and after the COVID-19 outbreak in the USA show that returns on education deviated from their long-term trend and increased during the pandemic. This showed that COVID-19 increased the returns on education for men and, in particular, for people with tertiary education by around one percentage point (Patrinos & Rivera-Olvera, 2025).

around 6.5% to 7.0% more than those without post-compulsory education. In contrast, those with basic vocational training earn on average only about 4.5% to 5.0% more per additional year in school. Persons who have passed a federal and higher federal vocational examination or with a higher federal vocational school qualification can expect the highest return of around 7.0% to 7.5% per additional year of education and training. These figures represent only average values calculated on the assumption of typical training periods. However, the individual return on education can vary greatly depending on the programme type⁵ and specialisation as well as on other cognitive and non-cognitive skills.

376 Returns in 2023 to an additional year of education, by education type

Data: FSO (SLFS); calculations: SCCRE



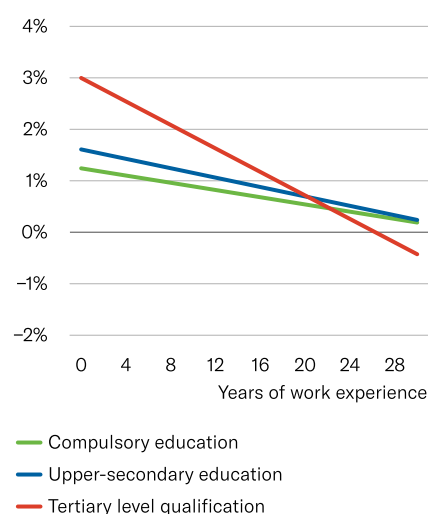
The returns to education are calculated in relation to the incomes of persons without post-compulsory education. The calculation is based on assumptions about the additional training years required for each type of education and training. The returns for people with a baccalaureate education (light colours) are probably overestimated, since on average about half of the individuals in this category started tertiary education but did not complete it; it would therefore have to be assumed that they attended more years of education (SCCRE, 2018). The returns in Figure 376 were calculated relative to the median rather than the average salary and assume linearity per additional school year. The heterogeneity in the distribution of wages by education category, and particularly among persons without post-compulsory education, explains why the returns on education in Figure 376 are slightly lower than those in Figure 375.

Even the first wage estimates used to calculate the return to education (Mincer, 1974) show that productivity is influenced not only by formal educational attainment but also by experience, which increases with the duration of working life (Jedwab et al., 2023). Turning experience into productivity increases and thus into higher wages, whether through learning on the job or continuing education and training, again depends on the education received (Heckman et al., 2003; Lemieux & Grossbard, 2006). The higher the formal education when persons starts to work, the more such

⁵ In Switzerland, persons with vocational education and training have a higher employment rate, and the wage distributions clearly overlap with vocational and general education qualifications (Kuhn & Schweri, 2023).

377 Income for an additional year of professional experience by highest educational qualification

Data: FSO (SLFS); calculations: SCCRE



Reading example

The chart shows the earnings for an additional year of work experience, which depend on a person's previous work experience. A value of 2.5% for persons with a tertiary degree and 5 years of professional experience means, for example, that the expected salary increase is 2.5% for the 6th year of professional experience. Wage increases are higher for entering an occupation than for gaining work experience. For people with a tertiary degree, wage increases are higher at the beginning but then taper off more quickly. This well-known phenomenon is mainly due to the higher learning effects and productivity gains at the beginning of a professional career.

persons are able to increase their wages through their experience in the labour market (→ Figure 377). There are many reasons for this. Firstly, the better trained persons are, the faster and more productively they can convert the skills they acquired in a specific job into productive work and thus earn more. Secondly, better educated persons tend to pursue further education over the years, which results in higher productivity and thus makes it possible to increase their wages (→ *chapter Continuing education and training, page 321*). Thirdly, employers will benefit from providing more CET to workers with higher cognitive abilities (Frisvold & Kim, 2024). Fourthly, people with a higher level of education are more likely to gain access to occupations with higher productivity potential.

In addition to the documented significance of cognitive abilities on the labour market, non-cognitive abilities are also assuming an increasingly important role (Alderotti et al., 2023; Belfi & Borghans, 2025; Deming & Siliman, 2025; Edin et al., 2022; Kiener et al., 2023; Langer & Wiederhold, 2023; Lochner et al., 2025; Woessmann, 2025). Some evidence suggests that personal traits, such as competitiveness, self-confidence and risk-tolerance, have an effect on earnings and thus help to explain gender differences in income, for example (Dariel et al., 2024). A study of VET graduates has shown the following: A medium level of self-competence (e.g. resilience, sense of responsibility, motivation, helpfulness and reliability) in an occupation leads to the highest returns compared to a low or high level of self-competence; in professions with a high cognitive requirement profile, strong self-competence are associated with higher returns on wages (Kiener et al., 2023). With regard to the Big Five personality traits, extroversion and emotional stability are associated with higher wages, while agreeableness and openness are associated on average with lower wages even within occupations (Izadi & Tuhkuri, 2024; Rohrbach-Schmidt et al., 2023). There is also evidence that social skills – including the ability to work well in a team and communicate effectively with co-workers – are seen as drivers of individual wage increases for those with lower formal education (Aghion et al., 2024).

Growth, externalities and fiscal returns

Education also generates an important monetary benefit for society as a whole, which manifests in the form of higher economic growth, higher wage levels across the board (Guo et al., 2024) and more revenue from income tax (Elsenberger & Kendzia, 2023). On the one hand, the fiscal benefit results from more highly educated people becoming more productive, earning higher wages and thus paying significantly more taxes due to tax progression. On the other hand, fiscal returns are favoured by the fact that more educated individuals receive fewer state transfer payments (social benefits, etc.). Fiscal returns on education can thus be seen as being linked to benefits in the form of higher tax revenues and lower government transfer payments on the one hand and to costs in the form of educational expenditure by the state on the other. However, there are two reasons why the fiscal return on education is difficult to interpret without further correction: Firstly, many people would have invested in their education even if they had no or only little state support; in other words, the potential of fiscal returns is rarely fully exploited. Secondly, as in the case of individual returns on education, the causal relationship between education and returns

must be considered: The actual fiscal return on education would be overestimated if those with better education and training could have increased their income even without higher education.

Besides the individual and fiscal returns, there are also social returns on education, as in the case when education results in external benefits for others who do not have an education. Positive externalities are usually spillover effects, for example when a person's own salary is affected by colleague's productivity (Hong & Lattanzio, 2025; Portugal et al., 2025). A recent study shows that 9% of individual returns to education can be attributed to such spillover causes. Spillovers can also arise when less well-educated people become more productive through collaboration with better-educated workers, or when the latter pass on part of their productivity gains to the former (Herkenhoff et al., 2024; Jarosch et al., 2021).

Empirically, spillovers can also arise through proximity to a higher education institution or the concentration of high-skilled workers nearby, which provides both monetary and non-monetary benefits to other workers, companies and residents of an area (Acton et al., 2025; Bonaccorsi et al., 2024).

Education contributes to the growth and development of a nation as a whole because it increases the productivity not only of the individual but of all workers. More human capital helps explain income and productivity differences between countries. However, the validity and magnitude of the effect of education on GDP growth in income regressions amongst countries depends strongly on model assumptions. The results of a recent study show that human capital in Europe is an important determinant of the regional level of innovation and economic development. Literacy, in particular, significantly affects current patent applications and GDP per capita (Diebolt & Hippe, 2022). Evidence suggests that insufficient human capital – due to school drop-out rates or weak cognitive and non-cognitive skills – can incur personal costs and considerable fiscal and social costs (Brunello & Rocco, 2024).

Although all these factors provide a monetary benefit from the perspective of society as a whole, many of them focus on non-monetary benefits, especially when seen from an individual perspective. For this reason, the non-monetary benefits of education will be dealt with in detail in the following sections.

The **concentration of more persons with a university degree** or the opening of new higher education institutions nearby can positively affect the wages of others in the region and cause economic growth locally (Lehnert et al., 2024; Goehausen & Thomsen, 2024; El-Komboz & Fackler, 2023). A study has shown that setting up a university of applied sciences – particularly in the fields of chemistry, life sciences, business and management – will cause new companies to relocate to that area (Schlegel & Backes-Gellner, 2023). The ideal geographical proximity to other skilled workers or higher education institutions is still being debated, but some studies suggest that a radius of less than 25 kilometres is optimal (Eppelsheimer et al., 2022).⁶

⁶ It is difficult to determine the causal effect of higher education institutions or high-skilled workers, as their locations in turn may depend on local economic conditions. For this reason, all the studies mentioned above use appropriate strategies to take this into account.

The non-monetary benefit of education

Education and skills in general influence many aspects of life, beyond the world of work. Better education is expected to have positive effects on health and thus on life expectancy, personal satisfaction, peaceful coexistence, political participation and various other life outcomes. The following sections refer to the main outcomes that education can affect positively.

Health

A study conducted in the canton of Zug has shown that learners at the lower-secondary level C (basic requirements) had worse **health**, whereas learners in classes with advanced requirements (lower-secondary level A) consumed less stimulants and addictive substances than those in the lower levels of education (*Rachamin et al., 2023*).

One of the most important hoped-for non-monetary effects of education is on a person's health and life expectancy. A study based on the Swiss National Cohort and the Swiss Health Survey shows that women and men recorded an increase in their overall lifespan of three and five years, respectively, between 1990 and 2014. However, the gain in the number of years of health varies depending on the level of education: While the number is rising for persons with a university degree, it remains the same among those who have completed only their compulsory education (*Remund & Cullati, 2022*). The effect of education on health can result directly or indirectly from a range of causes. Firstly, more education directly promotes health awareness, such as knowledge⁷ about the consequences of unhealthy habits such as smoking, alcohol misuse, lack of exercise, or health risks such as teenage pregnancy (*Bor et al., 2024; Garcez et al., 2025*). Secondly, persons with better education are better at maintaining their health: For example, they often know better when to take certain preventive measures in the interests of their health (*García & Heckman, 2023; Boes & Liu, 2024*). It has been shown that in Switzerland the likelihood of someone having supplementary hospital insurance increases with the education level (*Altwickler-Hámori & Stucki, 2023*). Thirdly, education increases the opportunity costs of diseases, which in turn reduces the incentives for unhealthy habits and raises those for health-promoting ones, such as healthy eating and exercise. Education also reduces the likelihood of persons staying in jobs with adverse health effects and increases the likelihood of them paying closer attention to their health while at work. Finally, as in the case of salaries, there can also be spillover effects relating to health. For example, there is evidence that people are healthier and enjoy higher life expectancy if they live in places with higher levels of education on average (*Bor et al., 2024*).

In addition to these direct effects, health is also indirectly influenced by education, especially via a higher income (*Danesh et al., 2024*). Conversely, stress factors caused by low levels of education – such as unemployment, low income or financial difficulties – can have a direct negative effect on health and the person's life circumstances (social exclusion, risk of divorce, etc.).⁸

⁷ A representative sample of adults aged 58 and older in Switzerland shows a significant positive correlation between education and health literacy, as measured in the areas of healthcare, illness prevention, and health promotion (*Meier et al., 2022*).

⁸ Based on national census data, it was determined that patients with upper-secondary education and compulsory education in Switzerland stay in hospital longer on average than those with tertiary education. However, these effects can be explained almost entirely by comorbidities (*Bayer-Oglesby et al., 2022*), which in turn can be explained by one of the indirect factors, namely the faster development of chronic diseases among low-income individuals (*Danesh et al., 2024*).

The parents' education has also been shown to affect their children's health and education (Mikkonen *et al.*, 2020).

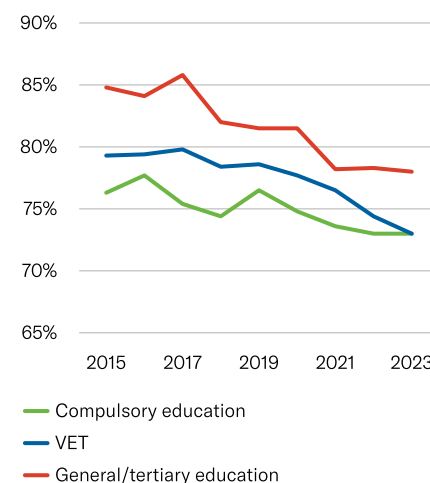
The evaluations of current data from Switzerland should be viewed on the condition that the correlations between education and health do not necessarily indicate causal relationships (→ Figure 378). Data from the Swiss Household Panel 2010–2023 show that the subjectively perceived state of health increases as the level of education rises and is highest among people with general education and a university degree. Despite or perhaps precisely because of this range of direct and indirect factors through which education can affect the state of health, the causal link between education and health is difficult to quantify,⁹ and not every correlation provides proof of a causal effect. Firstly, there are selection effects, which means that those who, for example, would have been more likely to promote their health also tend to be more educated, even without completing lengthy training and education programmes. Secondly, there are unobserved third variables that influence education levels and health positively, thus giving rise to only a spurious correlation between education and health. These include many non-cognitive abilities such as the locus of control, self-control, agreeableness and conscientiousness. According to one study, for most health measures, the disaggregated Big Five personality traits and belief in control account for 30% to 45% of the gradient between education and health (Gensowski & Gørtz, 2024). It was found that the personality traits in a sample of adults aged 58 and older in Switzerland correlate significantly with health literacy, in particular openness and neuroticism (Ryser *et al.*, 2023).

Thirdly, there are also empirically well-documented forms of reverse causality. This means that people with poorer health or unhealthy habits can spend less time learning or achieve poorer cognitive outcomes for precisely this reason (Bagues & Villa, 2024; Gopalan & Edara, 2023; Hull & Yan, 2024).¹⁰

These interdependencies are especially pronounced in connection with mental health. Most recent data from the European COME-HERE panel and from sources such as the International Social Survey Program show a worrying trend, especially among young people, of a significant decline in mental health, both in absolute terms and when compared to older age groups (Blanchflower *et al.*, 2024). Education plays a key role in influencing mental health. For example, lower levels of education increase the risk of mental health disorders such as mild to moderate depression, ADHD and general anxiety disorders (Demange *et al.*, 2023). Other studies show that education can be protective for women in terms of their physical and mental health and the risk of abuse (Özer & Fidrmuc, 2024). At the same time, mental health problems may affect a person's success in education (Agnafors *et al.*, 2021; Burger & Strassmann Rocha, 2024; Burger *et al.*, 2024; Matthews *et al.*, 2023; Smith *et al.*, 2021); for example, such problems can result in general

378 People with good or very good subjective health, by educational background

Data: FORS (Swiss Household Panel);
calculations: SCCRE

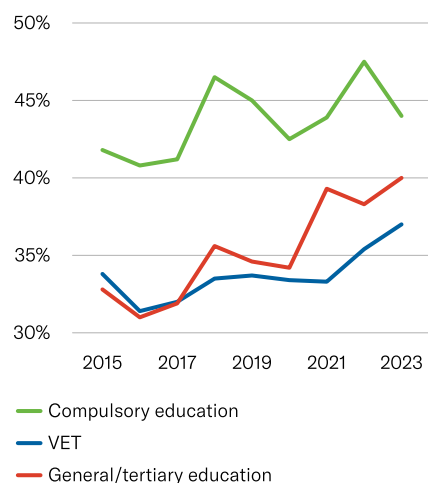


9 Studies of school reforms to identify causal effects cannot demonstrate a uniform, direct causal effect of education on health (Barcellos *et al.*, 2025; Lleras-Muney, 2022). Some found no causal effects at all (Masuda & Shigeoka, 2023), while others show evidence that extra education administered on the basis of reforms has led to improved health and the increased use of healthcare services (Gehrsitz & Williams Jr, 2024).

10 For example, results for Switzerland suggest that sport – especially intensive, fifteen-minute, cognitively demanding physical exercise (exergame) – facilitates information processing and improves the executive functions among the more active children (Anzeneder *et al.*, 2023). A study examining a cannabis sales policy in Maastricht (NL) found that students' academic performance increased significantly when they were no longer permitted to buy cannabis (Marie & Zöhlitz, 2017).

379 Proportion of people with frequent depression symptoms, by educational background

Data: FORS (Swiss Household Panel);
calculations: SCCRE



educational difficulties or raise the probability of someone dropping out of school (*von Simson et al., 2022*).

Data from the Swiss Household Panel 2010–2023 (→ Figure 379) shows the proportion of people with frequent depressive symptoms, broken down by educational background. On average, persons with no post-compulsory education (ISCED 1/2) are significantly more likely to suffer from depression than those with a VET background (ISCED 3B/5B), general education, or a university degree (ISCED 3A/5A/6).

Data from the Swiss Health Survey show that persons without post-compulsory education suffer from pathological sleep disorders more often than those with a tertiary qualification. Although persons who did not complete their post-compulsory education most often complained of sleep disorders, such disorders in recent years have increased most among those with a tertiary education (*FSO, 2024r*).

Advances in genetic research have led to recent studies that examine the relationship between health and education more closely (*Chen et al., 2023; Fan et al., 2023*). Genome-wide association studies show that both risk behaviours and educational attainment are heritable and exhibit a highly polygenic structure. However, little research has been carried out so far on the extent to which risk behaviour and educational attainment have common genetic overlaps. There is nevertheless evidence that children with a stronger genetic predisposition for education also have a lower genetic predisposition for health-related risk behaviour (*Amin et al., 2021; Arellano Spano et al., 2024*) and for better overall health (*Bolyard & Savelyev, 2025; Howe et al., 2023; Kendler et al., 2023; Salvatore et al., 2020*).¹¹

The studies that were presented suggest that mental health and education are linked in complex ways. Related support programmes can play a significant role in improving health and helping persons to finish their education (*Wickersham et al., 2021*).

Well-being and happiness

As in the case of health effects, there are potentially a number of direct and indirect mechanisms with which education can influence well-being¹². Moreover, especially health and well-being have a strong positive correlation. On the one hand, knowledge acquired through education can be viewed as a benefit in itself and thus boost well-being. On the other hand, education can improve our ability to reflect on our situation and that of others, thus increasing our chances of better managing our life in general and of dealing with strokes of fate, things that in turn will boost well-being. Reaching a certain education level and associating with a particular group that identifies itself on the basis of education can also bring about a positive psychological effect. Conversely, a higher education level can lead to higher expectations on oneself and others, and on life in general – expectations that are harder to meet, and the failure to do so can negatively affect well-being. One study

¹¹ Another study established a stronger genetic predisposition whereby education is associated with an increased likelihood that an adolescent will consume alcohol (*Davis et al., 2022*).

¹² In this report, the terms life satisfaction, well-being and happiness are used interchangeably, although their meanings are not necessarily the same; see *Bucher (2018)* and *Veenhoven (2018)*. Another related concept is subjective well-being (SWB), which is seen as a facet or specific form of well-being and captures how people view their own lives (*Diener et al., 2018; Heffetz & Caspi, 2025*).

shows, for example, that unemployment has a stronger negative effect on the life satisfaction for persons with higher education (Bertermann *et al.*, 2024). This finding also suggests that better educated persons in high-skilled societies are more likely to be confronted with the declining economic value of their qualifications. As a result, it becomes more difficult for them to maintain a high level of well-being (Araki, 2022).

In addition to the direct effects of education on well-being, indirect influences must also be considered here (Elsas, 2021). Income (Araki, 2022), profession and employment (Giuliano *et al.*, 2024), as well as health are possible means through which education can influence life satisfaction levels. The many possible direct and indirect factors in turn make it difficult to empirically identify the influencing factors precisely. For this reason and because education can have both positive and negative effects on subjectively perceived satisfaction, there is still little empirical evidence of its effects on well-being. In addition, there is also the possibility of a reverse causality: It is conceivable that persons with lower satisfaction will spend less time educating themselves. The results of a sample of learners in lower-secondary education in Switzerland indicate that school performance correlates positively with well-being over a one-year period – especially if the learners have a positive attitude toward school, enjoy going there, and view their academic abilities positively. However, negative dimensions of well-being – such as worries at school, physical impairments, and social problems – were not correlated with students' academic performance (Morinaj & Hascher, 2022). When considering such restrictions, the following empirical evaluations apply in the case of Switzerland (→ Figure 380).

Identifying a causal effect becomes all the more difficult when also considering the presence of personality traits and individual characteristics that can affect educational achievement and well-being (Belfi & Borghans, 2025). Studies for Switzerland indicate that behaviour at school relating to habits and character traits can positively affect a learner's well-being and performance in that school. Examples of strengths of character include creativity, friendliness and humour (Wagner & Ruch, 2023).

While the problem of measuring the effect on health mostly involve the countless measures and manifestations of health, the problem concerning satisfaction is that researchers do not always agree on how satisfaction can and should be measured in the first place (Andreoni *et al.*, 2024; Heffetz & Caspi, 2025; Liu & Netzer, 2023).

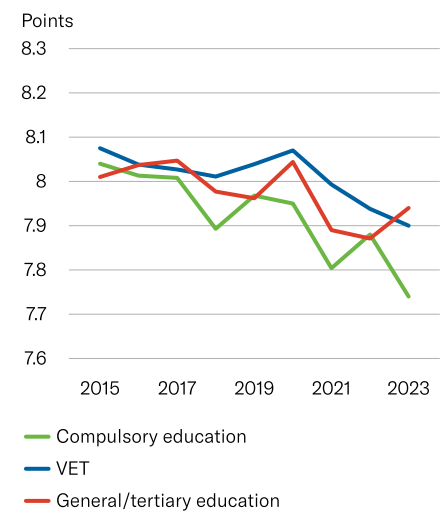
Crime

The positive effects of education also include an education-related reduction in criminal and other socially harmful behaviour (Hjalmarsson *et al.*, 2024; Lavecchia *et al.*, 2025; Machin & Sandi, 2025; Moschion & van Ours, 2025). Here, too, a number of direct and indirect means of influence exist, some of which have been well documented empirically. Education can not only directly strengthen cognitive and non-cognitive characteristics and skills, such as patience, hard work, and risk aversion, but also boost wellbeing, which in turn can reduce the likelihood of anti-social and criminal behaviour. A direct connection between education and crime is also formed when young people stay in school longer and thus have less time and fewer opportunities to commit criminal acts altogether. Several studies have established this on

380 Average life satisfaction, by educational background

Life satisfaction is measured on a scale of 0 (not at all satisfied) to 10 (fully satisfied).

Data: FORS (Swiss Household Panel 2010–2023); calculations: SCCRE

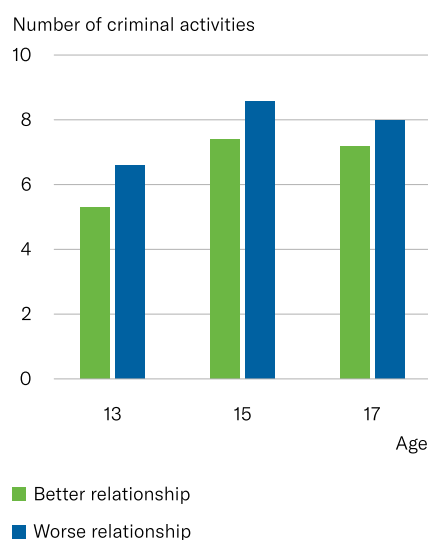


In terms of average life satisfaction among the various education categories, virtually no differences have been identified at least until 2017. After 2018, it became apparent that those without post-compulsory education on average have a somewhat lower level of life satisfaction than those with a VET background or a general tertiary degree, although the differences are not significant and have also levelled off in absolute terms in recent years. However, this should be seen against a decline in life satisfaction across all education categories.

A Canadian study looked into the **effects of a programme** to provide coaching, tutoring, group activities and financial support to high school students who are at risk. Young people from areas covered in the programme were compared with similar young people with low-income who lived outside these areas before and after the programme was launched. Linked data on school attendance and criminal cases indicates that participation in the programme reduced the probability of an alleged criminal act up to early adulthood by 6 percentage points or 33%, mainly due to fewer property offences being committed (Lavecchia et al., 2025).

381 Association between crime and the teacher-student relationship

Data: Obsuth et al. (2023)



Reading example

The graph shows the cumulative average crime rate across 28 different criminal activities (e.g. shop-lifting, driving without a driving licence, vandalism, but excluding serious violence, such as robbery) by adolescents aged 13, 15 and 17 by type of relationship between the teacher and the learners (worse vs. better). At the age of 17, young people with a poor teacher-student relationship had about 8 criminal activities while those with a better relationship had an average of 7.2.

the basis of changes in compulsory schooling (Anders et al., 2023; Bell et al., 2022; García et al., 2023; Gray-Lobe et al., 2023; Huttunen et al., 2023). Extending compulsory schooling or expanding upper-secondary education has proven to be particularly effective in keeping young people in school during a phase of their lives in which – when considering their entire lifespan – the risk of delinquency tends to be temporarily rather high. On the other hand, time spent in school increases other types of crimes committed there during school hours (Hansen et al., 2024; Jones & Karger, 2023), as analyses of school closures confirm (Bacher-Hicks et al., 2022; Borbely et al., 2023).

One way in which education can influence crime rates indirectly is through the income and career opportunities it provides, causing the opportunity costs of socially undesirable behaviour to rise sharply and the incentives for illegally acquiring income and gaining recognition to drop at the same time. Since potential income from criminal behaviour is highly uncertain and involves a great deal of risk compared with the relatively secure income from investments in education, it can be assumed that more risk-averse people will choose to avoid such conduct. However, the effect of the opportunity cost of reducing criminal behaviour may be lower if the person perceives the gains to be much higher than the risk of getting caught. This is used, for example, to explain the phenomenon whereby in white-collar crime a positive correlation tends to exist between education and income and the probability of committing a crime (Armandola et al., 2023). However, education can reduce not only participation in crime but also the likelihood of being convicted, as some studies show (Farrington et al., 2023).

A Zurich study with 1,483 young people from the z-proso project looked at how the quality of the teacher-student relationship (→ Figure 381). The result: Young people with a better relationship with their teachers tended to show less delinquent behaviour at the ages of 13, 15 and 17. Such relationships thus apparently help to prevent crime (Obsuth et al., 2023).

Reverse causality is also possible in the case of crime, whereby indirect factors can play a role (Carr et al., 2023). Education can influence the probability of crimes being committed; conversely, it is possible that criminal activity or the risk of violent crime, especially during adolescence, reduces the probability of completing a longer or better education (Chang & Paddilla-Romo, 2023; Deb & Gangaram, 2024). A study from India shows that an increase in violent crime in a certain district correlates with poorer reading and math scores, especially among children from socio-economically disadvantaged homes. Possible mechanisms include factors relating to the home, such as less mobility among the children and poorer mental health, as well as school-specific factors such as fewer well-trained teachers (Sharma & Sunder, 2025). Finally, non-cognitive skills and personality traits also play an important role and can contribute to a spurious correlation between education and crime.

Knowledge and behaviour concerning the environment

Potentially positive benefits of education arise when it contributes to environmental awareness and environmentally-friendly behaviour. This connection is established most directly when the topics of environment and ecology are included in the curricula of schools and other educational institutions, as is the case in all three language regions with compulsory education in Switzerland. International studies show that this can have a positive effect on knowledge about the environment and on attitudes, intentions – and especially on self-reported behaviours (*Holtmaat & Alford-Hamburg, 2023; van de Wetering et al., 2022*).

There are also indications that the content of natural sciences classes (evolution-based versus creation-based) can effect attitudes, knowledge and decisions that run counter to the principles of science. An analysis in the USA uses staggered reforms that exploit the scope of evolution theory in the educational standards of the States. The enhanced coverage of the topic of evolution not only increased learners' knowledge of evolution theory but also led to better recognition of this theory in adulthood; it does not suppress religiosity or influence political attitudes but leads to education and labour market decisions that more closely align with the principles of life sciences (*Arold, 2024*).

Even if formal education increases environmental awareness, there may be a gap between such awareness and a person's actual behaviour towards the environment (*Mannoni, 2025*). For example, there is evidence that environmentally-friendly attitudes better predict environmentally-friendly behaviours when personal costs are low or environmental benefits are high (*Wyss et al., 2022*).

While for other non-monetary returns the income effect of education often leads to other positive effects from higher income, this is only partly the case with environmental behaviour, where the effect can even correlate negatively. In summary, education can bring about a direct effect, which in the best case positively carries over to environmental behaviour. On the other hand, there is an indirect income effect from education that can be either positive or negative – higher income opens up opportunities for environment-conscious behaviour but can also spur consumption and thus produce a stronger environment-damaging effect. These contrary effects indicate that more education produces multiple outcomes in terms of environmental behaviour. For example, a survey of respondents in twenty countries has shown that educated and respondents with a more liberal orientation generally support climate policy more strongly. On the other hand, higher household income aligns with stronger support for climate action only in less than half of the countries (*Dechezleprêtre et al., 2025*). An intervention study using data from 1,000 households in Basel also indicates that a higher level of education positively correlates with more knowledge about the environment and more pronounced energy-saving behaviour. However, higher income is also associated with higher energy consumption (*Hess et al., 2022*).

As with the other topics, there are not only direct and indirect effects of education in terms of environmental behaviour and attitudes but also a reverse influence of environmental conditions on educational outcomes. For example, there is evidence that an increase in air pollution negatively affects maths and reading scores (*Dang et al., 2025*) and that natural disasters

A Swiss study of 547 persons looked into how well they assess the **CO₂ emission reduction potential** of different behaviours. Sustainable nutrition was generally underestimated, while energy-saving lamps were overestimated. The absence of a car and the avoidance of transatlantic flights were assessed correctly. While strong knowledge boosted the intention to take effective steps, the willingness to behave in an environmentally-friendly manner generally increased if doing so required only a small effort (*Cologna et al., 2022*).

A study, based on a new database on compulsory education laws, examining the causal effect of human capital accumulation on a range of **climate outcomes** in Europe (including Switzerland) found that one extra year of education led to a 6.3% increase in climate-friendly beliefs, an 8.5% increase in climate-friendly behaviours, a 1.7% increase in green policy preferences, and a 35% increase in votes for green party members (*Angrist et al., 2024*).

can still affect student performance for up to five years afterwards (Gust, 2024), even though not all the studies produced significant results (Fukushima et al., 2024).

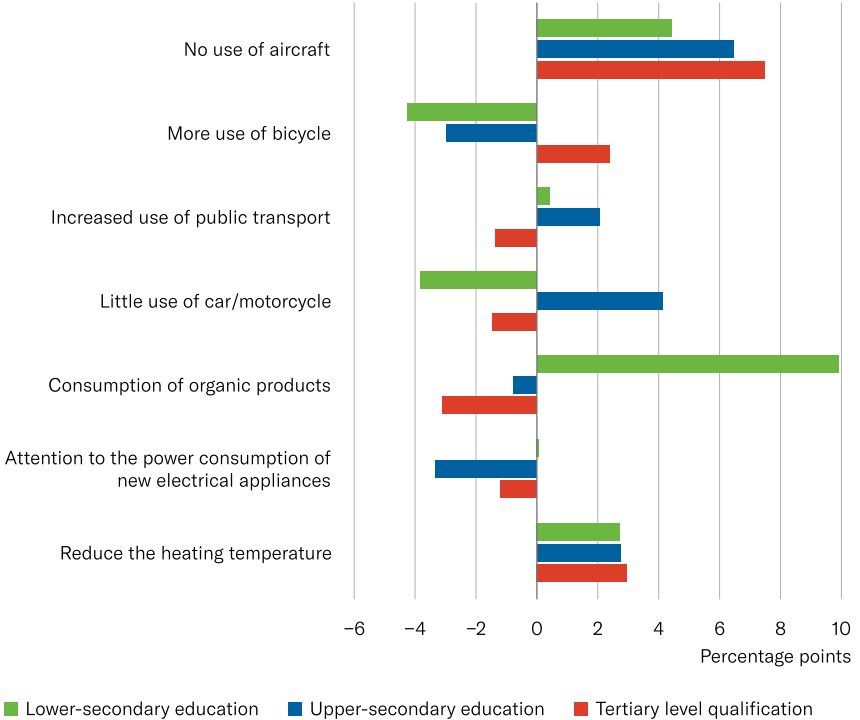
Since the middle of 2018, youth movements have emerged worldwide under the name Fridays for Future to call for strong climate protections. In Switzerland, this movement is supported in particular by the *Klimastreik* group. A survey of its activists shows that they tend to be well educated and mostly have an affluent background (Schaupp et al., 2022).

Despite these movements and the greater involvement of people with better education, there is no clear link between education and a trend towards environmentally friendlier behaviour (→ Figure 382). It should be noted, however, that the period 2019–2023 coincides with the Covid-19 pandemic, which could explain, for example, why aircraft were used less frequently by people across all levels of education. Figure 382 highlights the changes in the environmental behaviour of the Swiss population aged 15 to 74 between 2019 and 2023 (SCCRE, 2023).

382 Change in environmental behaviour by educational level

Data: FSO (omnibus surveys 2019, 2023); calculations: SCCRE

The changes, expressed in percentage points, indicate the extent to which the proportions have changed between the two surveys in the following areas:
the proportion of those who always or mostly indicated
a) turning the heat when a space is empty for at least two days, b) considering electricity consumption when buying smaller electrical appliances or lamps, c) consuming organically produced food; the proportion of those who reported less than once a month or never d) using a car/motorcycle; the proportion of people who reported e) using public transport, f) using a bicycle at least once a week or more often, and g) never getting on an airplane.



Political participation

The anticipated effect from education on the knowledge and behaviours relating to citizenship is paramount for members of a society to coexist peacefully and for a democracy to function well. As in the case of knowledge about the environment, there are attempts to influence political participation directly through school curricula (Deimel et al., 2024; Weinberg, 2022). While knowledge about politics is an inadequate condition for civic engagement, it nevertheless counts as a necessary prerequisite. As with

the other forms of non-monetary education benefits, a distinction must be made between more education, i.e. especially longer education periods, and the specific educational content (Bell *et al.*, 2024).¹⁴ There is evidence that the latter can have a lasting effect on young people's civic engagement.¹⁵ A study about media literacy in the USA on how university students can use, analyse critically, evaluate and design media content has found the following: High media literacy positively affects knowledge of current events and internal political efficacy¹⁶, but not political activity per se (Ashley *et al.*, 2017; Geers *et al.*, 2020). There are also indications that those who experienced democracy directly at school or university (e.g. as class representatives, student council members, or democratic decision-makers in the classroom) tend to vote and become politically involved more often (Kiess, 2022).

Although some factors suggest that a causal relationship exists between a higher level of education and increased political activity, statistical correlations in this case, too, do not readily indicate such causality. Studies that in turn use school reforms to identify causal effects have shown that even strong correlations between educational attainment and political activities do not always pass the test of a causal relationship (Weinschenk & Dawes, 2022; Willeck & Mendelberg, 2022). One reason for this may be the existence of indirect factors. For example, a higher level of education can increase voter turnout through higher socio-economic status and resources available for political participation (Jeroense & Spierings, 2023), even though some studies fail to establish a link between income and political participation (Brännlund *et al.*, 2024; Broockman *et al.*, 2024). As with other topics, there are disruptive effects here as well. For example, people with different social backgrounds attend different educational institutions and also complete them differently. At the same time, the social background also affects political participation (Grasso & Giugni, 2022). Finally, the latter shows that non-cognitive skills play a decisive role and can have a more important effect than skills taught in schools (Belfi & Borghans, 2025).

Various studies, however, indicate a generally positive relationship between education and political activity (Cattacin & Mischler, 2022; Mishra *et al.*, 2023). Persons with higher education levels are likely to vote more often (Ahearn *et al.*, 2023), have a stronger interest in and commitment to politics and social networks, and are more likely to participate in political protests and actions (Schaupp *et al.*, 2022) (→ Figure 383).

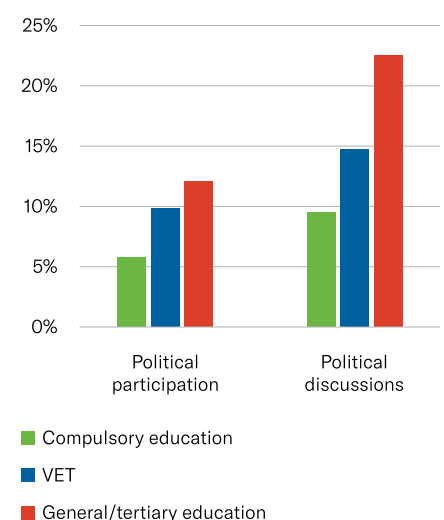
Digital media literacy is now particularly important for broadly defined political participation in view of the trends in social media and internet use.¹³ It is widely believed that the emergence of social media has a profound effect on the civic engagement of young people. Various studies suggest that new social media can effectively promote citizen participation (Knowles *et al.*, 2023; Lybeck *et al.*, 2024).

Results of a representative survey of people aged between 16 and 25 living in Switzerland show that 70% of them use **social media** such as Instagram, Facebook, Twitter or TikTok to learn about political issues several times a week (Heimann *et al.*, 2023). The results of a study in the USA clearly show that efforts to promote digital skills increase the online engagement of young people in politics (Kahne & Bowyer, 2019).

383 Political participation by educational background

Participation in political meetings and frequent political discussions in household

Data: FORS (Swiss Household Panel 2023); calculations: SCCRE



Political participation measures whether a person has attended political meetings in the last 12 months, while the indicator of political discussions was constructed based on the frequency of political discussions in the family. A value of 8 or more on a scale from 0 (never) to 10 (very common) was assumed to be common.

¹³ For definitions and measurements of digital political participation, see Serdült & Hofmann (2022).

¹⁴ A study based on data from five European countries shows that people with a university degree are more likely to participate politically than those with a degree from a university of applied sciences. The same applies to those with a master's degree (compared to those with a bachelor's degree) and to those with a degree in the humanities and social sciences. However, it was not possible to establish a universal correlation between the various qualifications and degrees and the abilities and participation in behaviours relating to citizenship (Mühleck & Hadjar, 2023).

¹⁵ For an overview of the components of civic engagement in adolescence, see Buchmann (2024).

¹⁶ Internal political efficacy refers to the feeling that one's own political actions can make a difference in political processes and political decision making.

BIBLIOGRAPHY

- Abrahamsson, S. (2024). *Smartphone bans, student outcomes and mental health* (NHH Dept. of Economics Discussion Paper No. 01). Norwegian School of Economics (NHH). <http://dx.doi.org/10.2139/ssrn.4735240>
- Abrassart, A., Busemeyer, M. R., Cattaneo, M. A., & Wolter, S. C. (2020). Do adult foreign residents prefer academic to vocational education? Evidence from a survey of public opinion in Switzerland. *Journal of Ethnic and Migration Studies*, 46(15), 3314–3334. <https://doi.org/10.1080/1369183X.2018.1517595>
- Acemoglu, D. (2002). Technical change, inequality, and the labor market. *Journal of Economic Literature*, 40(1), 7–72. <https://doi.org/10.1257/0022051026976>
- Acemoglu, D., Autor, D., Hazell, J., & Restrepo, P. (2022). Artificial intelligence and jobs: Evidence from online vacancies. *Journal of Labor Economics*, 40(S1), 293–340. <https://doi.org/10.1086/718327>
- Ackermann, T., & Benz, R. (2023). Diverging educational aspirations among compulsory school-leavers in Switzerland. *Swiss Journal of Sociology*, 49(2), 339–366. <https://doi.org/10.2478/sjs-2023-0018>
- Acton, R. K., Cortes, K., Miller, L., & Morales, C. (2025). *Distance to degrees: How college proximity shapes students' enrollment choices and attainment across race-ethnicity and socioeconomic status*. *Economics of Education Review*, forthcoming. <https://doi.org/10.1016/j.econedurev.2025.102724>
- Adamopoulou, E., Cao, Y., & Kaya, E. (2024). *Gritty peers* (IZA Discussion Paper No. 17446). Institute of Labor Economics (IZA). <https://ssrn.com/abstract=5020381>
- Aeppli, M., Muehleemann, S., Pfeifer, H., Schweri, J., Wenzelmann, F., & Wolter, S. C. (2024). *The impact of hiring costs for skilled workers on apprenticeship training: A comparative study* (Economics of Education Working Paper Series No. 214). Swiss Leading House VPET-ECON. <https://ideas.repec.org/p/iso/educat/o214.html>
- Aerne, A., & Bonoli, G. (2022). *Equivalent? Not quite. Employer perceptions of the value of alternative skill certification credentials in the childcare sector in Switzerland* [Seminar Paper]. University of Lausanne.
- Aeschlimann, B., Graf, L., Neumann, J., Pusterla, F., & Schweri, J. (2024). *Lehrstellenförderung: Situationsanalyse und Handlungsfelder*. Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/2024-05/OBS_EHB_2024_Lehrstellenfoerderung_Schlussbericht_Final_1.pdf
- Aeschlimann, B., & Schweri, J. (2024). *Kein Abschluss ohne Anschluss? Durchlässigkeit zwischen Gymnasium und beruflicher Grundbildung* (Trend im Fokus No. 12). Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/2024-04/TIF_KeinAbschlussOhneAbschluss_DE_2024.pdf
- af Burén, P., & Schweri, J. (2024). *Firms' training processes and their apprentices' education success* (Economics of Education Working Paper Series No. 225). Swiss Leading House VPET-ECON. <https://ideas.repec.org/p/iso/educat/o225.html>
- Aghion, P., Bergeaud, A., Blundell, R. W., & Griffith, R. (2024). *Social skills and the individual wage growth of less educated workers* (INSEAD Working Paper 2024/19/EPS). INSEAD. <https://dx.doi.org/10.2139/ssrn.4774931>
- Agnafors, S., Barmark, M., & Sydsjö, G. (2021). Mental health and academic performance: A study on selection and causation effects from childhood to early adulthood. *Social Psychiatry and Psychiatric Epidemiology*, 56(5), 857–866. <https://doi.org/10.1007/s00127-020-01934-5>
- Ahearn, C. E., Brand, J. E., & Zhou, X. (2023). How, and for whom, does higher education increase voting? *Research in Higher Education*, 64, 574–597. <https://doi.org/10.1007/s11162-022-09717-4>
- Albers, T., Jungmann, T., & Lindmeier, B. (2009). Sprache und Interaktion im Kindergarten – zur Bedeutung sprachlicher Kompetenzen für den Zugang zur Peerkultur in elementarpädagogischen Einrichtungen. *Zeitschrift für Heilpädagogik*, 6, 202–212. <https://www.fachportal-paedagogik.de/literatur/vollanzeige.html?Fld=3097478>
- Albiez, J., Strazzeri, M., & Wolter, S. C. (2025). Students' grit and their post-compulsory educational choices and trajectories. *Education Economics*, forthcoming. <https://doi.org/10.1080/09645292.2025.2542734>
- Albiez, J., & Wolter, S. C. (2021). *Determinanten des sprachregionalen Austausches während der obligatorischen Schulzeit in der Schweiz* (SCCRE Staff Paper No. 23). Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/staffpaper/staffpaper_23_sprachaustausch.pdf
- Alderotti, G., Rapallini, C., & Traverso, S. (2023). The Big Five personality traits and earnings: A meta-analysis. *Journal of Economic Psychology*, 94. <https://doi.org/10.1016/j.joep.2022.102570>
- Alesina, A., Carlana, M., La Ferrara, E., & Pinotti, P. (2024). Revealing stereotypes: Evidence from immigrants in schools. *American Economic Review*, 114(7), 1916–1948. <https://doi.org/10.1257/aer.20191184>
- Alesina, A., & La Ferrara, E. L. (2005). Ethnic diversity and economic performance. *Journal of Economic Literature*, 43(3), 762–800. <https://doi.org/10.1257/002205105774431243>
- Almlund, M., Duckworth, A. L., Heckman, J. J., & Kautz, T. D. (2011). Chapter 1 – personality psychology and economics. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 4, p. 1–181). Elsevier. <https://doi.org/10.1016/B978-0-444-53444-6.00001-8>
- Altmejd, A. (2024). *Inheritance of fields of study* (CESifo Working Paper No. 11113). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.4827105>
- Altonji, J., & Zhu, Z. (2025). *Returns to specific graduate degrees: Estimates using Texas administrative records* (NBER Working Paper No. 33530). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w33530>
- Altwickler-Hámori, S., & Stucki, M. (2023). Factors associated with the choice of supplementary hospital insurance in Switzerland – an analysis of the Swiss Health Survey. *BMC Health Services Research*, 23(1). <https://doi.org/10.1186/s12913-023-09221-0>
- Amin, V., Behrman, J. R., Fletcher, J. M., Flores, C. A., Flores-Lagunes, A., & Kohler, H.-P. (2021). Genetic risks, adolescent health, and schooling attainment. *Health Economics*, 30(11), 2905–2920. <https://doi.org/10.1002/hec.4421>
- Anders, J., Barr, A. C., & Smith, A. A. (2023). The effect of early childhood education on adult criminality: Evidence from the 1960s through 1990s. *American Economic Journal: Economic Policy*, 15(1), 37–69. <https://doi.org/10.1257/pol.20200660>
- Andreoni, J., Bernheim, B. D., & Jia, T. (2024). *Do people report happiness accurately?* (NBER Working Paper No. 32208). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w32208>
- Angelone, D. (2019). Schereneffekte auf der Sekundarstufe I? Zum Einfluss des Schultyps auf den Leistungszuwachs in Deutsch und Mathematik. *Schweizerische Zeitschrift für Bildungswissenschaften*, 41(2), 446–466. <https://doi.org/10.25656/01:20350>
- Angelone, D. (2022). *Soziale Ungleichheiten im Verlauf der obligatorischen Schulzeit: Beiträge zu herkunftsbedingten Disparitäten der Kompetenzentwicklung und Bildungsbeteiligung* [Dissertation, University of Bern]. <http://boristheses.unibe.ch/3299/>
- Angrist, J., Autor, D., & Pallais, A. (2022). Marginal effects of merit aid for low-income students. *The Quarterly Journal of Economics*, 137(2), 1039–1090. <https://doi.org/10.1093/qje/qjabo50>
- Angrist, J. D., Lavy, V., Leder-Luis, J., & Shany, A. (2019). Maimonides' rule redux. *American Economic Review: Insights*, 1(3), 309–324. <https://doi.org/10.1257/aeri.20180120>
- Angrist, N., Winseck, K., Patrinos, H. A., & Zivin, J. G. (2024). Human capital and climate change. *The Review of Economics and Statistics*, 1–28. https://doi.org/10.1162/rest_a_01444

- Antecol, H., Eren, O., & Ozbeklik, S. (2015). The effect of teacher gender on student achievement in primary school. *Journal of Labor Economics*, 33(1), 63–89. <https://doi.org/10.1086/677391>
- Antonietti, C., Cattaneo, A., & Amenduni, F. (2022). Can teachers' digital competence influence technology acceptance in vocational education? *Computers in Human Behavior*, 132. <https://doi.org/10.1016/j.chb.2022.107266>
- Antonietti, C., Consoli, T., Schmitz, M.-L., Cattaneo, A., Gonon, P., & Petko, D. (2025). Digital constructivists, activators or presenters? Different profiles of technology integration among Swiss upper secondary school teachers. *Computers & Education*, 227. <https://doi.org/10.1016/j.compedu.2024.105225>
- Antoniou, F., Alghamdi, M. H., & Kawai, K. (2024). The effect of school size and class size on school preparedness. *Frontiers in Psychology*, 15. <https://doi.org/10.3389/fpsyg.2024.1354072>
- Anzeneder, S., Zehnder, C., Schmid, J., Martin-Niedecken, A. L., Schmidt, M., & Benzing, V. (2023). Dose-response relation between the duration of a cognitively challenging bout of physical exercise and children's cognition. *Scandinavian Journal of Medicine & Science in Sports*, 33(8), 1439–1451. <https://doi.org/10.1111/sms.14370>
- Araki, S. (2022). Does education make people happy? Spotlighting the overlooked societal condition. *Journal of Happiness Studies*, 23, 587–629. <https://doi.org/10.1007/s10902-021-00416-y>
- Arellano Spano, M., Morris, T. T., Davies, N. M., & Hughes, A. (2024). Genetic associations of risk behaviours and educational achievement. *Communications Biology*, 7(1), 1–10. <https://doi.org/10.1038/s42003-024-06091-y>
- argev [Interkantonale Arbeitsgemeinschaft Externe Evaluation von Schulen]. (2023). *Drei-Jahresprogramm 2024–2026*. argev. https://www.argev.ch/sites/default/files/argev_drei-jahresprogramm_2024-2026_pv_2023-06-22_genehmigt.pdf
- Armandola, N. G., Ehler, A., & Rauhut, H. (2023). Rebel without a cause: The effects of social origins and disposable income on rule violations. *European Sociological Review*, 39(1), 14–29. <https://doi.org/10.1093/esr/jcac016>
- Arold, B. W. (2024). Evolution vs. creationism in the Classroom: The lasting effects of science education. *The Quarterly Journal of Economics*, 139(4), 2331–2375. <https://doi.org/10.1093/qje/qjae019>
- Arold, B. W., Hufe, P., & Stoekli, M. (2022). *Genetic endowments, educational outcomes and the mediating influence of school investments* (CESifo Working Paper No. 9841). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.4167444>
- Arpawong, T. E., Gatz, M., Zavala, C., Gruenewald, T. L., Walters, E. E., & Prescott, C. A. (2023). Nature, nurture, and the meaning of educational attainment: Differences by sex and socioeconomic status. *Twin Research and Human Genetics: The Official Journal of the International Society for Twin Studies*, 26(1), 1–9. <https://doi.org/10.1017/thg.2023.6>
- Ashley, S., Maksl, A., & Craft, S. (2017). News media literacy and political engagement: What's the connection? *Journal of Media Literacy Education*, 9(1), 79–98. <https://doi.org/10.23860/JMLE-2017-9-1-6>
- Ashton, M. C., & Lee, K. (2007). Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personality and Social Psychology Review*, 11(2), 150–166. <https://doi.org/10.1177/1088868306294907>
- Attanasio, O., Cattani, S., & Meghir, C. (2022). Early childhood development, human capital, and poverty. *Annual Review of Economics*, 14, 853–892. <https://doi.org/10.1146/annurev-economics-092821-053234>
- Attanasio, O., Conti, G., Jervis, P., Meghir, C., & Okbay, A. (2025). *Gene x environment interactions: Polygenic scores and the impact of an early childhood intervention in Colombia* (CESifo Working Paper No. 11869). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.5254067>
- Auer, D., Bonoli, G., Fossati, F., & Liechti, F. (2019). The matching hierarchies model: Evidence from a survey experiment on employers' hiring intent regarding immigrant applicants. *International Migration Review*, 53(1), 90–121. <https://doi.org/10.1177/0197918318764872>
- Aum, S., & Shin, Y. (2025). *The labor market impact of digital technologies* (NBER Working Paper No. 33469). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33469>
- Aune, D., Keum, N., Giovannucci, E., Fadnes, L. T., Boffetta, P., Greenwood, D. C., Tonstad, S., Vatten, L. J., Riboli, E., & Norat, T. (2018). Dietary intake and blood concentrations of antioxidants and the risk of cardiovascular disease, total cancer, and all-cause mortality: A systematic review and dose-response meta-analysis of prospective studies. *The American Journal of Clinical Nutrition*, 108(5), 1069–1091. <https://doi.org/10.1093/ajcn/nqy097>
- Autor, D., Chin, C., Salomons, A., & Seegmiller, B. (2024). New frontiers: The origins and content of new work, 1940–2018. *The Quarterly Journal of Economics*, 139(3), 1399–1465. <https://doi.org/10.1093/qje/qjae008>
- Autor, D. (2014). Skills, education, and the rise of earnings inequality among the “other 99 percent”. *Science*, 344(6186), 843–851. <https://doi.org/10.1126/science.1251868>
- Autor, D. (2022). *The labor market impacts of technological change: From unbridled enthusiasm to qualified optimism to vast uncertainty* (NBER Working Paper No. 30074). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w30074>
- Averdijk, M., Ribeaud, D., & Eisner, M. (2022). External childcare and socio-behavioral development in Switzerland: Long-term relations from childhood into young adulthood. *PLOS ONE*, 17(3). <https://doi.org/10.1371/journal.pone.0263571>
- Axelrud, L. K., Hoffmann, M. S., Vosberg, D. E., Santoro, M., Pan, P. M., Gadelha, A., Belangero, S. I., Miguel, E. C., Shin, J., Thapar, A., Smoller, J. W., Pausova, Z., Rohde, L. A., Keller, M. C., Paus, T., & Salum, G. A. (2023). Disentangling the influences of parental genetics on offspring's cognition, education, and psychopathology via genetic and phenotypic pathways. *Journal of Child Psychology and Psychiatry*, 64(3), 408–416. <https://doi.org/10.1111/jcpp.13708>
- Bach, D., Haberzeth, E., & Osbahr, S. (Eds.). (2022). *Höhere Fachschulen in der Schweiz. Herausforderungen und Perspektiven* (Vol. 12). hep Verlag. <https://doi.org/10.36933/978303521849>
- Bach, M., & Sievert, S. (2025). Birth cohort size variation and the estimation of class size effects. *Journal of Human Resources*, 60(2), 578–606. <https://doi.org/10.3368/jhr.0919-10430R2>
- Bacher, S., Ditttrich, A.-K., Kraler, C., Schauer, G., & Schreiner, C. (2024). Vorzeitiger Berufseinstieg ins Lehramt. Risiken für die Profession. *Journal für LehrerInnenbildung*, 24(1), 66–73. <https://doi.org/10.25656/01300506>
- Bacher-Hicks, A., Goodman, J., Green, J. G., & Holt, M. K. (2022). The Covid-19 pandemic disrupted both school bullying and cyberbullying. *American Economic Review: Insights*, 4(3), 353–370. <https://doi.org/10.1257/aeri.20210456>
- Bächli, M., & Tsankova, T. (2023). Free movement of workers and native demand for tertiary education. *Journal of Human Resources*. <https://doi.org/10.3368/jhr.0721-11805R2>
- Backes-Gellner, U., & Lehnert, P. (2021). The contribution of vocational education and training to innovation and growth. *Oxford Research Encyclopedia of Economics and Finance*. <https://doi.org/10.1093/acrefore/9780190625979.013.653>
- Baer-Baldauf, P. (2020). *Wie gestalten Hochschulen ein praxisbezogenes Studium? Eine vergleichende Fallstudienuntersuchung von Praxisselementen und förderlichen institutionellen Rahmenbedingungen in Bachelorstudiengängen der Betriebswirtschaftslehre in Deutschland und in der Schweiz* [Dissertation, University of St. Gallen]. https://iwp.unisg.ch/fileadmin/user_upload/HSG_ROOT/Institut_IWP/01_Das_Institut/Profil/Dissertationen/Baer-Baldauf.pdf
- Bagues, M., & Villa, C. (2024). *Minimum legal drinking age and educational outcomes* (IZA Discussion Paper No. 17507). Institute of Labor Economics (IZA). <https://ssrn.com/abstract=5048003>

- Baier, D. (2019). Jugendkriminalität in der Schweiz: Entwicklung und Einflussfaktoren. *Zeitschrift für Jugendkriminalrecht und Jugendhilfe*, 30(3), 214–223. <https://doi.org/10.21256/zhaw-18192>
- Balestra, S., Eugster, B., & Liebert, H. (2020). Summer-born struggle: The effect of school starting age on health, education, and work. *Health Economics*, 29(5), 591–607. <https://doi.org/10.1002/hec.4005>
- Balestra, S., Eugster, B., & Liebert, H. (2022). Peers with special needs: Effects and policies. *The Review of Economics and Statistics*, 104(3), 602–618. https://doi.org/10.1162/rest_a_00960
- Balkis, M., Arslan, G., & Duru, E. (2016). The school absenteeism among high school students: Contributing factors. *Educational Sciences: Theory and Practice*, 16(6), 1819–1831. <https://eric.ed.gov/?id=EJ1130748>
- Ballatore, R., Fort, M., & Ichino, A. (2018). Tower of Babel in the classroom: Immigrants and natives in Italian schools. *Journal of Labor Economics*, 36(4), 885–921. <http://dx.doi.org/10.1086/697524>
- Bamert, J. (2025). *Does exposure to female STEM professionals reduce the gender gap in STEM participation?* Swiss Economic Institute ETH Zurich (KOF).
- Barabasch, A., Cygan-Rehm, K., & Leibing, A. (2024). *Timing of school entry and personality traits in adulthood* (IZA Discussion Paper No. 17387). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4997709>
- Barcellos, S. H., Carvalho, L., Langa, K., Nimmagadda, S., & Turley, P. (2025). *Education and dementia risk* (NBER Working Paper No. 33430). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33430>
- Bardach, L., & Klassen, R. M. (2020). Smart teachers, successful students? A systematic review of the literature on teachers' cognitive abilities and teacher effectiveness. *Educational Research Review*, 30. <https://doi.org/10.1016/j.edurev.2020.100312>
- Bardach, L., Klassen, R. M., & Perry, N. E. (2022). Teachers' psychological characteristics: Do they matter for teacher effectiveness, teachers' well-being, retention, and interpersonal relations? An integrative review. *Educational Psychology Review*, 34, 259–300. <https://doi.org/10.1007/s10648-021-09614-9>
- Bartanen, B., Grissom, J. A., & Rogers, L. K. (2019). The impacts of principal turnover. *Education Evaluation and Policy Analysis*, 41(3), 350–374. <https://doi.org/10.3102/o162373719855044>
- Batrach, A., Autin, F., Bataillard, F., & Butera, F. (2019). School selection and the social class divide: How tracking contributes to the reproduction of inequalities. *Personality & Social Psychology Bulletin*, 45(3), 477–490. <https://doi.org/10.1177/0146167218791804>
- Bauer, C. E., & Kost, J. (2023). Lehrpersonenmangel und Quereinstieg. *Beiträge zur Lehrerinnen- und Lehrerbildung*, 41(3), 388–403. <https://doi.org/10.25656/01:28654>
- Baulos, A. W., García, J. L., & Heckman, J. J. (2024). *Perry Preschool at 50: What lessons should be drawn and which criticisms ignored?* (NBER Working Paper No. 32972). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w32972>
- Baumann, S. (2022). Research profile clusters among lecturers in non-traditional higher education. An exploratory analysis in the Swiss context. *International Journal of Educational Research Open*, 3. <https://doi.org/10.1016/j.ijedro.2022.100182>
- Baumann, S., & Leštytė, L. (2022). Changing research structures and academic staff competence in the Swiss non-traditional university sector. *Higher Education Policy*, 35, 750–771. <https://doi.org/10.1057/s41307-021-00231-3>
- Baumgartner, M. (2022). Professional competence(s) of physical education teachers: Terms, traditions, modelling and perspectives. *German Journal of Exercise and Sport Research*, 52, 550–557. <https://doi.org/10.1007/s12662-022-00840-z>
- Baumgartner, M., Jeisy, E., & Berthold, C. (2023). From knowledge to performance in physical teacher education: A Delphi study and a pretest for the content validation of the test instruments. *Swiss Journal of Educational Research*, 45(2). <https://doi.org/10.24452/sjer.45.2.6>
- Bayer-Oglesby, L., Zumbrunn, A., & Bachmann, N. (2022). Social inequalities, length of hospital stay for chronic conditions and the mediating role of comorbidity and discharge destination: A multilevel analysis of hospital administrative data linked to the population census in Switzerland. *PLOS ONE*, 17(8). <https://doi.org/10.1371/journal.pone.0272265>
- Bazzi, S., Gaduh, A., Rothenberg, A., & Wong, M. (2019). Unity in diversity? How intergroup contact can foster nation building. *American Economic Review*, 109(11), 3978–4025. <https://doi.org/10.1257/aer.20180174>
- Beaton, T., Kidd, M., Niu, A., & Vella, F. (2021). Age of starting school, academic performance, and the impact of non-compliance: An experiment within an experiment, evidence from Australia. *Economic Record*, 99(325), 175–206. <https://doi.org/10.1111/1475-4932.12722>
- Beck, M., Mantel, C., & Bischoff, S. (2023). Switzerland: Diversity in the classroom, uniformity in the faculty. In M. Gutman, W. Jayusi, M. Beck, & Z. Bekerman (Eds.), *To Be a Minority Teacher in a Foreign Culture* (p. 45–60). Springer. https://doi.org/10.1007/978-3-031-25584-7_4
- Becker, J., Burik, C. A. P., Goldman, G., Wang, N., Jayashankar, H., Bennett, M., Belsky, D. W., Karlsson Linnér, R., Ahlskog, R., Kleinman, A., Hinds, D. A., Caspi, A., Corcoran, D. L., Moffitt, T. E., Poulton, R., Sugden, K., Williams, B. S., Harris, K. M., Steptoe, A., ... Okbay, A. (2021). Resource profile and user guide of the Polygenic Index Repository. *Nature Human Behaviour*, 5(12), 1744–1758. <https://doi.org/10.1038/s41562-021-0119-3>
- Belfi, B., & Borghans, L. (2025). The importance of socio-emotional skills for multiple life outcomes and the role of education. In M. Wolbers & D. Verhaest (Eds.), *Handbook of Education and Work* (p. 75–104). Edward Elgar Publishing. <https://doi.org/10.4337/9781035309917.0001010>
- Belfield, C. (2023). *NEPC review: Small class sizes for improving student achievement in primary and secondary schools: A systematic review*. National Education Policy Center (NEPC). <https://nepc.colorado.edu/review/class-size-reduction>
- Bell, B., Costa, R., & Machin, S. (2022). Why does education reduce crime? *Journal of Political Economy*, 130(3), 732–765. <https://doi.org/10.1086/717895>
- Bell, D., Holbein, J., Imlay, S., & Smith, J. (2024). *Which colleges increase voting rates?* (IZA Discussion Paper No. 16813). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4736398>
- Benites, M., & Parrado, E. (2024). *Mirror, mirror on the wall: Which jobs will AI replace after all? A new index of occupational exposure* (IDB Working Paper No. 1624). Inter-American Development Bank (IDB). <https://doi.org/10.18235/013125>
- Bennhoff, F. H., García, J. L., & Ermini Leaf, D. (2024). The dynastic benefits of early childhood education: Participant benefits and family spillovers. *Journal of Human Capital*, 18(1), 44–73. <https://doi.org/10.1086/728058>
- Berlingieri, F., & Bolz, T. (2025). Earnings of university dropouts across Europe. *Education Economics*, forthcoming. <https://doi.org/10.1080/09645292.2025.2518379>
- Berlingieri, F., Diegmann, A., & Sprietsma, M. (2023). Preferred field of study and academic performance. *Economics of Education Review*, 95. <https://doi.org/10.1016/j.econedurev.2023.102409>
- Berne, J., Jacob, B., Musaddiq, T., Shapiro, A., & Weiland, C. (2024). The effect of early childhood programs on third-grade test scores: Evidence from transitional kindergarten in Michigan. *AEA Papers and Proceedings*, 114, 480–485. <https://doi.org/10.1257/pandp.2024.081>
- Bertermann, A., Kamhöfer, D., & Schildberg-Hörisch, H. (2024). *More education does make you happier – unless you are unemployed* (SSRN Scholarly Paper No. 4837434). Social Science Research Network (SSRN). <https://dx.doi.org/10.2139/ssrn.4837434>
- Besa, K.-S., & Vietgen, S. (2017). Repräsentanz, Integration und Abbruchintentionen von Studierenden mit Migrationshintergrund in Lehramtsstudiengängen: Eine Analyse anhand der Daten des Nationalen

- Bildungspanels (NEPS). *Beiträge zur Lehrerinnen- und Lehrerbildung*, 35(1), 195–206. <https://doi.org/10.25656/01:16806>
- Bethhäuser, B. A., Bach-Mortensen, A. M., & Engzell, P. (2023). A systematic review and meta-analysis of the evidence on learning during the Covid-19 pandemic. *Nature Human Behaviour*, 7, 375–385. <https://doi.org/10.1038/s41562-022-01506-4>
- Bettinger, E., Gurantz, O., Kawano, L., Sacerdote, B., & Stevens, M. (2019). The long-run impacts of financial aid: Evidence from California's Cal Grant. *American Economic Journal: Economic Policy*, 11(1), 64–94. <https://doi.org/10.1257/pol.20170466>
- Bianco, M., Harris, B., Garrison-Wade, D., & Leech, N. (2011). Gifted girls: Gender bias in gifted referrals. *Roeper Review*, 33(3), 170–181. <https://doi.org/10.1080/02783193.2011.580500>
- Biedermann, H., Oser, F., Konstantinidou, L., & Witorski, D. (2010). *Staatsbürgerinnen und Staatsbürger von morgen: Zur Wirksamkeit politischer Bildung in der Schweiz: Ein Vergleich mit 37 anderen Ländern*. University of Fribourg. <https://doci.bibliothek.li/abc/FLMA191086.pdf>
- Bieri Buschor, C., & Schuler Braunschweig, P. (2018). Predictive validity of a competence-based admission test – mentors' assessment of student teachers' occupational aptitude. *Assessment & Evaluation in Higher Education*, 43(4), 640–651. <https://doi.org/10.1080/02602938.2017.1390545>
- Binelli, C., Comi, S., Meschi, E., & Pagani, L. (2024). Every cloud has a silver lining: The role of study time and class recordings on university students' performance during Covid-19. *Journal of Economic Behavior & Organization*, 225, 305–328. <https://doi.org/10.1016/j.jebo.2024.07.012>
- Blanchflower, D. G., Bryson, A., Lepinteur, A., & Piper, A. (2024). *Further evidence on the global decline in the mental health of the young* (NBER Working Paper No. 32500). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w32500>
- Bless, G. (2018). Wirkungen der schulischen Integration auf Schülerinnen und Schüler. *Schweizerische Zeitschrift für Heilpädagogik*, 24(2), 6–14. <https://ojs.szh.ch/zeitschrift/article/view/700>
- Blömeke, S., Felbrich, A., Müller, C., Kaiser, G., & Lehmann, R. (2008). Effectiveness of teacher education. *ZDM Mathematics Education*, 40, 719–734. <https://doi.org/10.1007/s11858-008-0096-x>
- Blömeke, S., Jentsch, A., Ross, N., Kaiser, G., & König, J. (2022). Opening up the black box: Teacher competence, instructional quality, and students' learning progress. *Learning and Instruction*, 79. <https://doi.org/10.1016/j.learninstruc.2022.101600>
- Blömeke, S., Suhl, U., & Kaiser, G. (2011). Teacher education effectiveness: Quality and equity of future primary teachers' mathematics and mathematics pedagogical content knowledge. *Journal of Teacher Education*, 62(2), 154–171. <https://doi.org/10.1177/0022487110386798>
- Bloom, D. E., Prettnner, K., Saadaoui, J., & Veruete, M. (2025). Artificial intelligence and the skill premium. *Finance Research Letters*, 81. <https://doi.org/10.1016/j.frl.2025.107401>
- Böckelmann, C., Probst, C., Wassmer, C., & Baumann, S. (2022). Lecturers' qualifications and activities as indicators of convergence and differentiation in the Swiss higher education system. *European Journal of Higher Education*, 12(3), 229–254. <https://doi.org/10.1080/21568235.2021.1923547>
- Boes, S., & Liu, Y. (2024). Do individuals with better health insurance system knowledge make better decisions about their health plans? *Applied Economics*, 56(59), 8867–8883. <https://doi.org/10.1080/00036846.2023.2295303>
- Böhn, S., & Deutscher, V. (2022). Dropout from initial vocational training – a meta-synthesis of reasons from the apprentice's point of view. *Educational Research Review*, 35. <https://doi.org/10.1016/j.edurev.2021.100414>
- Bolli, T., Oswald-Egg, M. E., & Rageth, L. (2021). Meet the need – the role of vocational education and training for the youth labour market. *Kyklos*, 74(3), 321–348. <https://doi.org/10.1111/kykl.12269>
- Bolli, T., & Pusterla, F. (2022). Decomposing the effects of digitalization on workers' job satisfaction. *International Review of Economics*, 69, 263–300. <https://doi.org/10.1007/s12232-022-00392-6>
- Bolli, T., & Pusterla, F. (2023a). Complementarities among types of education in affecting firms' productivity. *LABOUR*, 37(4), 554–591. <https://doi.org/10.1111/labr.12256>
- Bolli, T., & Pusterla, F. (2023b). Is technological change really skills-biased? Firm-level evidence of the complementarities between ICT and workers' education. *Economics of Innovation and New Technology*, 32(1), 69–91. <https://doi.org/10.1080/10438599.2020.1871270>
- Bolli, T., & Rageth, L. (2024). Does time since arrival have an effect on immigrants' preferences for vocational education and training programs in Switzerland? *International Migration Review*, 58(1), 173–204. <https://doi.org/10.1177/01979183221139137>
- Bolyard, A., & Savelyev, P. A. (2025). Understanding the educational Attainment Polygenic Index and its interactions with SES in determining health in young adulthood. *Journal of Human Resources*, 60(5). <https://doi.org/10.3368/jhr.0521-11685R3>
- Bonaccorsi, A., Barin, L., Belingheri, P., Biagi, F., & Sanchez-Barrioluengo, M. (2024). Is higher education more important for firms than research? Disentangling university spillovers. *The Journal of Technology Transfer*, 49(3), 900–925. <https://doi.org/10.1007/s10961-023-10008-y>
- Booij, A. S., Leuven, E., & Oosterbeek, H. (2017). Ability peer effects in university: Evidence from a randomized experiment. *The Review of Economic Studies*, 84(2), 547–578. <https://doi.org/10.1093/restud/rdw045>
- Booth, A. L., Cardona-Sosa, L., & Nolen, P. (2018). Do single-sex classes affect academic achievement? An experiment in a coeducational university. *Journal of Public Economics*, 168, 109–126. <https://doi.org/10.1016/j.jpubeco.2018.08.016>
- Bor, J. H., Cutler, D. M., Glaeser, E. L., & Ristovska, L. (2024). Human capital spillovers and health: Does living around college graduates lengthen life? *NBER Bulletin on Health*. <https://go.gale.com/ps/i.do?p=HR-CA&sw=w&issn=&v=2.1&it=r&id=GALE%7CA807417034&sid=-googleScholar&linkaccess=abs>
- Borbely, D., Gehrsitz, M., McIntyre, S. G., & Rossi, G. (2023). *Permanent school closures and crime: Evidence from Scotland* (IZA Discussion Paper No. 16523). Institute of Labor Economics (IZA). <https://ssrn.com/abstract=4604427>
- Bosset, I., Hofmann, C., Duc, B., Lamamra, N., & Krauss, A. (2022). Premature interruption of training in Swiss 2-year apprenticeship through the lens of fit. *Swiss Journal of Educational Research*, 44(2), 277–290. <https://doi.org/10.24452/sjer.44.2.9>
- Brade, R., Himmler, O., Jaekle, R., & Weinschenk, P. (2024). *Helping students to succeed – the long-term effects of soft commitments and reminders* (CESifo Working Paper No. 11001). Center for Economic Studies (CESifo). <https://www.ssrn.com/abstract=4764348>
- Brägger, M. (2022). *Gewalterfahrungen von Lehrpersonen im schulischen Kontext*. Büro Brägger. https://www.lch.ch/fileadmin/user_upload/lch/Aktuell/Medienkonferenzen/Januar_2023/05_Kurzversion_LCH_Studie_Gewalterfuehrung_2022.pdf
- Brägger, M. (2024). *Die Berufszufriedenheit der Deutschschweizer Lehrerinnen und Lehrer*. Büro Brägger. <https://www.lch.ch/aktuell/detail/die-berufszufriedenheit-2024-der-deutschschweizer-lehrerinnen-und-lehrer>
- Brännlund, A., Cesarini, D., Lindgren, K.-O., Lindqvist, E., Oskarsson, S., & Östling, R. (2024). *Pocketbook politics: The impact of wealth on political preferences and participation* (NBER Working Paper No. 32777). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w32777>
- Brauchle, J., Unger, V., Schmidberger, L., & Hochweber, J. (2024). Hybrid learning during the Covid-19 pandemic – student perspectives on opportunities and limitations of hybrid distance learning. In *eapril conference proceedings 2023* (p. 59–72).

- <https://proforis.phsg.ch/server/api/core/bitstreams/odec7b08-4f41-4dc2-a545-e752bdb408bc/content>
- Broockman, D. E., Rhodes, E., Bartik, A. W., Dotson, K., Miller, S., Krause, P. K., & Vivalt, E. (2024). *The causal effects of income on political attitudes and behavior: A randomized field experiment* (NBER Working Paper No. 33 214). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33214>
- Brox, E., Davoli, M., & Strazzeri, M. (2025). *Classroom rank in math, occupational choices and labor market outcomes* (Economics of Education Working Paper Series No. 222). Swiss Leading House VPET-ECON. http://repec.business.uzh.ch/RePEc/iso/leading-house/o222_lhwpaper.pdf
- Brüderlin, M., & Jaunin, A. (2023). *Critères d'accès et pratiques tarifaires en matière d'accueil préscolaire dans le canton de Genève*. Service de la recherche en éducation (SRED) & observatoire cantonal de la petite enfance (OCPE). <https://www.ge.ch/document/34112/telecharger>
- Brühwiler, C., Hollenstein, L., Kassis, W., & Pauli, C. (2024). *Bericht zur Evidenzbasierung in der Lehrerinnen- und Lehrerbildung*. swissuniversities. https://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/Kammern/Kammer_PH/Dokumente/Berichte/Bericht_Evidenzbasierung_LL_B_240313_d.pdf
- Brühwiler, C., & Vogt, F. (2020). Adaptive teaching competency. Effects on quality of instruction and learning outcomes. *Journal for Educational Research Online*, 12(1), 119–142. <https://doi.org/10.25656/01:19121>
- Brunello, G., & Rocco, L. (2024). *The pecuniary costs of early school leaving and poor basic cognitive and non-cognitive skills* (IZA Discussion Paper No. 17 296). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4962274>
- Brunner, E., Dougherty, S., & Ross, S. L. (2025). Can technical education in high school smooth postsecondary transitions for students with disabilities? *Educational Researcher*. <https://doi.org/10.3102/0013189X251365623>
- Bucher, A. (2018). *Psychologie des Glücks* (2. Ed.). Beltz. <https://www.beltz.de/fachmedien/psychologie/produkte/details/32575-psychologie-des-gluecks.html>
- Buchmann, M. (2024). Integrated multidimensional constructs of adolescent civic engagement: Opportunities for theorizing the role of normative developmental competences and social change. *European Journal of Developmental Psychology*, 22(3), 285–301. <https://doi.org/10.1080/17405629.2024.2396384>
- Buchmann, M., Kriesi, I., Maarten, K., Imdorf, C., & Basler, A. (2016). Chapter 7: Differentiation in secondary education and inequality in educational opportunities: The case of Switzerland. In H.-P. Blossfeld, S. Buchholz, J. Skopek, & Triventi, M. (Eds.), *Models of secondary education and social inequality: An international comparison*. Elgar. <https://doi.org/10.4337/9781785367267.00016>
- Bühler, A. F., Lehnert, P., & Backes-Gellner, U. (2024). Curriculum updates in vocational education and changes in graduates' skills and wages. *Journal of Education and Work*, 37(5–6), 458–482. <https://doi.org/10.1080/13639080.2025.2456844>
- Bühler, J., Erhardt, T., Häner-Müller, M., & Schaltegger, C. A. (2025). Ist Blut dicker als Wasser? Wie die Familie den sozialen Aufstieg beeinflusst. *Perspektiven der Wirtschaftspolitik*, 26(1), 62–79. <https://doi.org/10.1515/pwp-2025-0001>
- Bühler, J., Schaltegger, C. A., & Häner-Müller, M. (2024). *The mystery of success: How family background shapes social mobility* (SSRN Scholarly Paper). Social Science Research Network (SSRN). <https://dx.doi.org/10.2139/ssrn.5227318>
- Burger, K. (2023). Revisiting the power of future expectations and educational path dependencies. *Advances in Life Course Research*, 58. <https://doi.org/10.1016/j.alcr.2023.100581>
- Burger, K., Becker, M., & Schoon, I. (2024). Mental health and educational attainment: How developmental stage matters. *Developmental Psychology*, 60(1), 108–123. <https://doi.org/10.1037/dev001634>
- Burger, K., & Strassmann Rocha, D. (2024). Mental health, gender, and higher education attainment. *Zeitschrift Für Erziehungswissenschaft*, 27, 89–122. <https://doi.org/10.1007/s11618-023-01187-3>
- Burkhauser, S. (2017). How much do principals matter when it comes to teacher working conditions? *Educational Evaluation and Policy Analysis*, 39(1), 126–145. <https://doi.org/10.3102/o162373716668028>
- Buser, M., & Melfi, G. (2022). Oral proficiency development of K-4 learners of the Swiss two-way immersion program FiBi (Filière Bilingue) in a highly multicultural context. *International Journal of Bilingual Education and Bilingualism*, 25(1), 328–341. <https://doi.org/10.1080/13670050.2019.1675583>
- Buser, T., Ahlskog, R., Johannesson, M., Koellinger, P., & Oskarsson, S. (2024). The causal effect of genetic variants linked to cognitive and non-cognitive skills on education and labor market outcomes. *Labour Economics*, 90. <https://doi.org/10.1016/j.labeco.2024.102544>
- Buser, T., Niederle, M., & Oosterbeek, H. (2024). Can competitiveness predict education and labor market outcomes? Evidence from incentivized choice and survey measures. *The Review of Economics and Statistics*, 1–45. https://doi.org/10.1162/rest_a_01439
- Busso, M., Montaña, S., & Muñoz-Morales, J. S. (2023). *Signaling specific skills and the labor market of college graduates* (IDB Working Paper Series No. 1456). Inter-American Development Bank (IDB). <https://dx.doi.org/10.18235/0004759>
- Bütikofer, S., Craviolini, J., Odermatt, M., & Wüest, B. (2023). *Welche Schule will die Schweiz?* Sotomo. <https://craft.stiftung-mercator.ch/files/Dokumente/Welche-Schule-will-die-Schweiz-Studienbericht-2023.pdf>
- Cabus, S., Napierała, J., & Carretero, S. (2021). *The returns to non-cognitive skills: A meta-analysis* (JRC Working Papers on Labour, Education and Technology No. 2021–06). Joint Research Centre (JRC). <https://publications.jrc.ec.europa.eu/repository/handle/JRC123308>
- Cacho, V., & Gollob, S. (2024). *SVEB-Branchenmonitor 2024: Weitere Erholung in der Weiterbildungsbranche*. Swiss Federation for Adult Learning (SVEB). <https://alice.ch/app/uploads/2024/09/sveb-branchenmonitor-2024.pdf>
- Calsamiglia, C., & Loviglio, A. (2019). Grading on a curve: When having good peers is not good. *Economics of Education Review*, 73. <https://doi.org/10.1016/j.econedurev.2019.101916>
- Camehl, V. G., & Peter, F. H. (2017). Je höher die Kita-Qualität, desto prosozialer das Verhalten von Kindern. *DIW Wochenbericht*, 84(51/52), 1197–1204. https://www.diw.de/documents/publikationen/73/diw_01c.573913.de/17-51-1.pdf
- Caneva, C. (2024). *Bilan des expériences de numérisation de l'éducation*. University of Fribourg. <https://www.fr.ch/sites/default/files/2024-09/bilan-des-experiences-de-numerisation-de-leducation.pdf>
- Caplin, A., Deming, D. J., Li, S., Martin, D. J., Marx, P., Weidmann, B., & Ye, K. J. (2024). *The ABC's of who benefits from working with AI: Ability, beliefs, and calibration* (NBER Working Paper No. 33 021). National Bureau of Economic Research (NBER). <https://ssrn.com/abstract=4978700>
- Carlana, M. (2019). Implicit stereotypes: Evidence from teachers' gender bias. *The Quarterly Journal of Economics*, 134(3), 1163–1224. <https://doi.org/10.1093/qje/qjz008>
- Carr, J., Marie, O., & Vujić, S. (2023). The economic benefits of education for the reduction of crime. In *Oxford Research Encyclopedia of Economics and Finance*. <https://doi.org/10.1093/acrefore/9780190625979.013.869>
- Cattacin, S., & Mischler, M. (2022). Politische Partizipation. In S. Huber (Eds.), *Junge Erwachsene heute* (p. 125–133). ch-x. <https://access.archive-ouverte.unige.ch/access/metadata/9fo4368f-ce42-4156-91b1-c43e20537a4d/download>
- Cattan, S., Kamhöfer, D. A., Karlsson, M., & Nilsson, T. (2023). The long-term effects of student absence: Evidence from Sweden. *The*

- Economic Journal*, 133(650), 888–903.
<https://doi.org/10.1093/ej/ueac078>
- Cattaneo, A., Antonietti, C., & Rausero, M. (2022). How digitalised are vocational teachers? Assessing digital competence in vocational education and looking at its underlying factors. *Computers & Education*, 176. <https://doi.org/10.1016/j.compedu.2021.104358>
- Cattaneo, A., Schmitz, M.-L., Gonon, P., Antonietti, C., Consoli, T., & Petko, D. (2025). The role of personal and contextual factors when investigating technology integration in general and vocational education. *Computers in Human Behavior*, 163. <https://doi.org/10.1016/j.chb.2024.108475>
- Cattaneo, M. A., Gschwendt, C., & Wolter, S. C. (2025). How scary is the risk of automation? Evidence from a large-scale survey experiment. *Journal of Economic Behavior & Organization*, 235. <https://doi.org/10.1016/j.jebo.2025.107034>
- Cattaneo, M. A., & Wolter, S. C. (2015). Better migrants, better PISA results: Findings from a natural experiment. *IZA Journal of Migration*, 4. <https://doi.org/10.1186/s40176-015-0042-y>
- Cattaneo, M. A., & Wolter, S. C. (2022). “Against all odds” Does awareness of the risk of failure matter for educational choices? *Economics of Education Review*, 87. <https://doi.org/10.1016/j.econedurev.2022.102225>
- Cavallaro, M., & Lepori, B. (2021). Institutional barriers to participation in EU framework programs: Contrasting the Swiss and UK cases. *Scientometrics*, 126, 1311–1328. <https://doi.org/10.1007/s11192-020-03810-0>
- Cawley, J., Han, E., Kim, J., & Norton, E. C. (2023). Genetic nurture in educational attainment. *Economics & Human Biology*, 49. <https://doi.org/10.1016/j.ehb.2023.101239>
- Cecchini, A., Dutrévis, M., Guille, E., & Jaunin, A. (2023). *De la petite enfance à la première rentrée scolaire: Portraits et enjeux de transition* (éclairages No. 3). Service de la recherche en éducation (SRED). <https://www.ge.ch/document/33781/telecharger>
- Cedefop. (2020). *Vocational education and training in Europe, 1995–2035: Scenarios for European vocational education and training in the 21st century* (Cedefop Reference Series No. 114). Publications Office of the European Union. <https://data.europa.eu/doi/10.2801/794471>
- Chabris, C. F., Lee, J. J., Cesarini, D., Benjamin, D. J., & Laibson, D. I. (2015). The fourth law of behavior genetics. *Current Directions in Psychological Science*, 24(4), 304–312. <https://doi.org/10.1177/0963721415580430>
- Chang, E., & Padilla-Romo, M. (2023). When crime comes to the neighborhood: Short-term shocks to student cognition and secondary consequences. *Journal of Labor Economics*, 41(4), 997–1039. <https://doi.org/10.1086/721656>
- Cheesman, R., Borgen, N. T., Lyngstad, T. H., Eilertsen, E. M., Ayorech, Z., Torvik, F. A., Andreassen, O. A., Zachrisson, H. D., & Ystrom, E. (2022). A population-wide gene-environment interaction study on how genes, schools, and residential areas shape achievement. *Npj Science of Learning*, 7(1), 1–9. <https://doi.org/10.1038/s41539-022-00145-8>
- Cheesman, R., Borgen, N. T., Sandsør, A. M. J., & Hufe, P. (2025). *The genetic lottery goes to school: Better schools compensate for the effects of students' genetic differences* (CESifo Working Paper No. 11883). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.5255348>
- Chen, D., Wang, X., Huang, T., & Jia, J. (2023). Genetic support of a causal relationship between cannabis use and educational attainment: A two-sample Mendelian randomization study of European ancestry. *Addiction*, 118(4), 698–710. <https://doi.org/10.1111/add.16090>
- Chen, K., & Jiang, X. (2024). *Learning from mistakes: The implications of course repetition for student subsequent success* (IZA Discussion Paper No. 16690). Institute of Labor Economics (IZA). <https://www.ssrn.com/abstract=4682474>
- Cheng, S., Kamina, A. C., Liu, Q., Wu, F., Wang, Z., Wang, X., & Liu, X. (2022). Association between weight status and bullying experiences among children and adolescents in schools: An updated meta-analysis. *Child Abuse & Neglect*, 134. <https://doi.org/10.1016/j.chiabu.2022.105833>
- Chorniy, A., Currie, J., & Sonchak, L. (2020). Does prenatal WIC participation improve child outcomes? *American Journal of Health Economics*, 6(2), 169–198. <https://doi.org/10.1086/707832>
- Chuard, C., Aerne, A., Eugster, B., & Hodler, R. (2025). Ethnic clustering in schools and early career outcomes. *Economics of Education Review*, 106. <https://doi.org/10.1016/j.econedurev.2025.102645>
- CIIP [Conférence intercantonale de l’instruction publique et de la culture de la Suisse romande et du Tessin]. (2024a). *Programme d’activité 2024–2027*. CIIP. https://www.ciip.ch/files/1049/Documents/Documents-CIIP/PA_CIIP-2024-2027.pdf
- CIIP [Conférence intercantonale de l’instruction publique et de la culture de la Suisse romande et du Tessin]. (2024b). *Les Moyens d’enseignement romands*. Retrieved 24 September 2025, from <https://www.ciip.ch/Instruction-publique/Moyens-denseignement-romands>
- CIIP [Conférence intercantonale de l’instruction publique et de la culture de la Suisse romande et du Tessin]. (2024c). *Éducation numérique*. CIIP. <https://per.ciip.ch/api/files/280>
- Clarke, D., Orefice, S., & Quintana-Domeque, C. (2019). The demand for season of birth. *Journal of Applied Econometrics*, 34(5), 707–723. <https://doi.org/10.1002/jae.2711>
- Cobb-Clark, D. A., Dahmann, S. C., Kamhöfer, D. A., & Schildberg-Hörisch, H. (2025). Schooling and self-control. *Journal of Economic Behavior & Organization*, 237. <https://doi.org/10.1016/j.jebo.2025.107147>
- Coleman, J. S. (1966). *Equality of educational opportunity*. US Department of Health, Education, and Welfare, Office of Education. <https://files.eric.ed.gov/fulltext/ED01275.pdf>
- Cologna, V., Berthold, A., & Siegrist, M. (2022). Knowledge, perceived potential and trust as determinants of low- and high-impact pro-environmental behaviours. *Journal of Environmental Psychology*, 79. <https://doi.org/10.1016/j.jenvp.2021.101741>
- Combet, B. (2024). Women’s aversion to majors that (seemingly) require systemizing skills causes gendered field of study choice. *European Sociological Review*, 40(2), 242–257. <https://doi.org/10.1093/esr/jcado21>
- Combet, B., & Oesch, D. (2021). The social-origin gap in university graduation by gender and immigrant status: A cohort analysis for Switzerland. *Longitudinal and Life Course Studies*, 12(2), 119–146. <https://doi.org/10.1332/l75795920X16034769228656>
- Comi, S., Origo, F., Pagani, L., & Tonello, M. (2021). Last and furious: Relative position and school violence. *Journal of Economic Behavior & Organization*, 188, 736–756. <https://doi.org/10.1016/j.jebo.2021.05.026>
- Compagnoni, M., Rechsteiner, B., Grob, U., Bayer, N., Wulschleger, A., & Maag Merki, K. (2025). No loss, no gain? Covid-19 school closures and Swiss fifth-graders’ competencies and self-concept in mathematics. *Zeitschrift Für Pädagogische Psychologie*, 39(3), 221–235. <https://doi.org/10.1024/1010-0652/a000366>
- Conley, D., Domingue, B. W., Cesarini, D., Dawes, C., Rietveld, C. A., & Boardman, J. D. (2015). Is the effect of parental education on offspring biased or moderated by genotype? *Sociological Science*, 2(6), 82–105. <https://doi.org/10.15195/v2.a6>
- Contini, D., Di Tommaso, M. L., Muratori, C., Piazzalunga, D., & Schiavon, L. (2022). *The Covid-19 pandemic and school closure: Learning loss in mathematics in primary education* (IZA Discussion Paper No. 14785). Institute of Labor Economics (IZA). <https://www.ssrn.com/abstract=4114323>
- Contreras, D. (2024). Gender differences in grading: Teacher bias or student behaviour? *Education Economics*, 32(6), 762–785. <https://doi.org/10.1080/09645292.2023.2252620>
- Coradi Vellacott, M., Hollenweger, J., Nicolet, M., & Wolter, S. C. (2003). *Soziale Integration und Leistungsförderung: Thematischer Bericht der Erhebung PISA 2000*. Federal Statistical Office (FSO) & Swiss Conference of Cantonal Ministers of Education (EDK). <https://edudoc.ch/>

- [nanna/record/24193/files/6.pdf?withWatermark=0&withMeta-data=0&registerDownload=1&version=1](#)
- Corbett, C., Hill, C., & St. Rose, A. (2008). *Where the girls are: The facts about gender equity in education*. American Association of University Women Educational Foundation (AAUW). <https://eric.ed.gov/?id=ED501319>
- Cornelissen, T., Dustmann, C., Raute, A., & Schönberg, U. (2018). Who benefits from universal child care? Estimating marginal returns to early child care attendance. *Journal of Political Economy*, 126(6), 2356–2409. <https://doi.org/10.1086/699979>
- Cornish, L. (2006). What is multigrade teaching? *Reaching EFA through multigrade teaching: Issues, contexts and practices*, 9–26. https://www.researchgate.net/publication/285141807_What_is_multigrade_teaching
- CRUS, KFH, & COHEP [Rectors' Conference of the Swiss Universities, Rectors' Conference of the Swiss Universities of Applied Sciences & Rectors' Conference of the Swiss Universities of Teacher Education]. (2010). *Konkordanzliste CRUS – KFH – COHEP*. CRUS, KFH & COHEP. https://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/Kammern/Kammer_FH/Publikationen/Konkordanzliste.pdf
- Currie, J., Mueller-Smith, M., & Rossin-Slater, M. (2022). Violence while in utero: The impact of assaults during pregnancy on birth outcomes. *The Review of Economics and Statistics*, 104(3), 525–540. https://doi.org/10.1162/rest_a_00965
- Dadisman, K., Nickow, A., & Oreopoulos, P. (2024). *The impact of early childhood parenting interventions on child learning: A systematic review and meta-analysis* (NBER Working Paper No. 32959). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w32959>
- Dahalan, F., Alias, N., & Shahaarom, M. S. N. (2024). Gamification and game based learning for vocational education and training: A systematic literature review. *Education and Information Technologies*, 29, 1279–1317. <https://doi.org/10.1007/s10639-022-11548-w>
- Danesh, K., Kolstad, J. T., Parker, W. D., & Spinnewijn, J. (2024). *The chronic disease index: Analyzing health inequalities over the lifecycle* (NBER Working Paper No. 32577). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w32577>
- Dang, H.-A. H., Do, M. N. N., & Nguyen, C. V. (2025). The impacts of climate change and air pollution on children's education outcomes: Evidence from Vietnam. *Economics of Education Review*, 106. <https://doi.org/10.1016/j.econedurev.2025.102656>
- Daniel, A., Neugebauer, M., & Watermann, R. (2019). Studienabbruch und Einstellungschancen auf dem Ausbildungsmarkt. Ein faktorieller Survey mit Arbeitgeber/innen. *Zeitschrift für Erziehungswissenschaft*, 22, 1147–1174. <https://doi.org/10.1007/s11618-019-00905-0>
- Daniel, A., Ham, J., Nikiforakis, N., & Stoop, J. (2024). *Disparities in psychological traits and income: Race, ethnicity, and gender in the U.S.* (IZA Discussion Paper No. 16818). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4737328>
- Darling-Hammond, L. (2012). *Powerful teacher education: Lessons from exemplary programs*. John Wiley & Sons. <https://www.wiley.com/en-us/Powerful+Teacher+Education%3A+Lessons+from+Exemplary+Programs-p-9781118429433>
- Darling-Hammond, L. (2023). Response to how teacher education matters. *Journal of Teacher Education*, 74(2), 157–159. <https://doi.org/10.1177/00224871231160378>
- Davies, G., Lam, M., Harris, S. E., Trampush, J. W., Luciano, M., Hill, W. D., Hagenars, S. P., Ritchie, S. J., Marioni, R. E., Fawns-Ritchie, C., Liewald, D. C. M., Okely, J. A., Ahola-Olli, A. V., Barnes, C. L. K., Bertram, L., Bis, J. C., Burdick, K. E., Christoforou, A., DeRosse, P., ... Deary, I. J. (2018). Study of 300,486 individuals identifies 148 independent genetic loci influencing general cognitive function. *Nature Communications*, 9. <https://doi.org/10.1038/s41467-018-04362-x>
- Davis, C. N., Gizer, I. R., Colodro-Conde, L., Statham, D. J., Martin, N. G., & Slutske, W. S. (2022). Educational attainment polygenic scores: Examining evidence for gene-environment interplay with adolescent alcohol, tobacco and cannabis use. *Twin Research and Human Genetics*, 25(4–5), 187–195. <https://doi.org/10.1017/thg.2022.33>
- de Gendre, A., Feld, J., Salamanca, N., & Zölitz, U. (2024). *Same-sex teacher effects* (Working Paper No. 438). University of Zurich. <https://doi.org/10.5167/uzh-234072%0A>
- de Gendre, A., & Kabátek, J. (2021). *From subsidies to loans: The effects of a national student finance reform on the choices of secondary school students* (Melbourne Institute Working Paper No. 12). Melbourne Institute of Applied Economic and Social Research. https://melbourneinstitute.unimelb.edu.au/_data/assets/pdf_file/0007/3854527/wp2021n12.pdf
- De Paola, M., & Gioia, F. (2017). Impatience and academic performance. Less effort and less ambitious goals. *Journal of Policy Modeling*, 39(3), 443–460. <https://doi.org/10.1016/j.jpolmod.2016.11.001>
- Deb, P., & Gangaram, A. (2024). The effects of school shootings on risky behavior, health, and human capital. *Journal of Population Economics*, 37(1), 1–28. <https://doi.org/10.1007/s00148-024-01008-9>
- Dechezleprêtre, A., Fabre, A., Kruse, T., Planterose, B., Sanchez Chico, A., & Stantcheva, S. (2025). Fighting climate change: International attitudes toward climate policies. *American Economic Review*, 115(4), 1258–1300. <https://doi.org/10.1257/aer.20230501>
- D-EDK [Deutschschweizer Erziehungsdirektorenkonferenz]. (2018). *Neuorganisation der sprachregionalen Zusammenarbeit im Bildungsraum der Deutschschweiz*. D-EDK. https://www.regionalkonferenzen.ch/sites/default/files/2019-02/d-edk_2018-10-29_medienmitteilung.pdf
- Deighton, K., Hudson, J., Manley, A. J., Kaiseler, M., Patterson, L. B., Rutherford, Z. H., & Swainson, M. (2019). Effects of emotional intelligence and supportive text messages on academic outcomes in first-year undergraduates. *Journal of Further and Higher Education*, 43(4), 494–507. <https://doi.org/10.1080/0309877X.2017.1377161>
- Deimel, D., Hahn-Laudenberg, K., Ziemes, J. F., & Abs, H. J. (2024). Civic education and social interactions at school as drivers of intended electoral participation: Similarities and differences in four European school systems. *Education, Citizenship and Social Justice*, 19(1), 37–57. <https://doi.org/10.1177/17461979221114549>
- Delgrande Jordan, M., Schmidhauser, V., & Balsiger, N. (2023). *Santé et bien-être des 11 à 15 ans en Suisse – situation en 2022, évolution dans le temps et corrélats. Résultats de l'étude Health Behaviour in School-aged Children (HBSC)* (No. 159). Addiction Suisse. <https://doi.org/10.58758/rech159>
- Demange, P. A., Hottenga, J. J., Abdellaoui, A., Eilertsen, E. M., Malanchini, M., Domingue, B. W., Armstrong-Carter, E., de Zeeuw, E. L., Rimpf, K., Boomsma, D. I., van Bergen, E., Breen, G., Nivard, M. G., & Cheesman, R. (2022). Estimating effects of parents' cognitive and non-cognitive skills on offspring education using polygenic scores. *Nature Communications*, 13(1). <https://doi.org/10.1038/s41467-022-32003-x>
- Demange, P., Boomsma, D., van Bergen, E., & Nivard, M. (2023). Evaluating the causal relationship between educational attainment and mental health. *European Neuropsychopharmacology*, 75. <https://doi.org/10.1016/j.euroneuro.2023.08.044>
- Deming, D. (2023). *Why do wages grow faster for educated workers?* (HKS Working Paper No. RWP23-017). Harvard Kennedy School (HKS). <https://dx.doi.org/10.2139/ssrn.4488398>
- Deming, D. J., & Silliman, M. I. (2025). Chapter 2 – Skills and human capital in the labor market. In C. Dustmann & T. Lemieux (Eds.), *Handbook of Labor Economics* (Vol. 6, p. 115–157). Elsevier. <https://ssrn.com/abstract=4950559>
- Denecker, C., Dutrévis, M., Petrucci, F., & Prosperi, O. (2024). *Évaluation des compétences des élèves genevois. État des lieux, enjeux et perspectives* (éclairages No. 5). Service de la recherche en éducation (SRED). <https://www.ge.ch/document/35538/telecharger>
- Denzler, S. (2011). University or polytechnic? Family background effects on the choice of higher education institution. *Schweizerische Zeitschrift für Soziologie*, 37(1), 79–97. <https://doi.org/10.5169/seals-814158>

- Denzler, S. (2023). Herausforderung Lehrkräftemangel. Versuch einer Einordnung und Diskussion von Handlungsfeldern. *Beiträge zur Lehrerinnen- und Lehrerbildung*, 41(3), 369–387. <https://doi.org/10.25656/01:28653>
- Denzler, S., Ruhose, J., & Wolter, S. C. (2025). Labour market effects of work-related continuous education in Switzerland – evidence from administrative data. *Economics of Education Review*, 107. <https://doi.org/10.1016/j.econedurev.2025.102683>
- Denzler, S., & Wolter, S. C. (2010). Der Einfluss des lokalen Hochschulangebots auf die Studienwahl. *Zeitschrift für Erziehungswissenschaft*, 13, 683–706. <https://doi.org/10.1007/s11618-010-0143-6>
- Denzler, S., & Wolter, S. C. (2018). Bildungsökonomische Sicht auf die Lehrerbildung in der Schweiz. *Journal für LehrerInnenbildung*, 18(2), 20–28.
- Di Stasio, V., & van de Werfhorst, H. G. (2016). Why does education matter to employers in different institutional contexts? A vignette study in England and the Netherlands. *Social Forces*, 95(1), 77–106. <https://doi.org/10.1093/sf/sow027>
- Diebold, T., Bossi, C. B., Nischak, P., Lorusso, S., & Perren, S. (2023). Emotionen und Emotionsregulation im Vorschulalter: Was zeigt sich im dyadischen Spiel? *Schweizerische Zeitschrift für Heilpädagogik*, 29(09). <https://doi.org/10.57161/z2023-09-01>
- Diebolt, C., & Hippe, R. (2022). The long-run impact of human capital on innovation and economic growth in the regions of Europe. In *Frontiers in Economic History* (p. 85–115). Springer. https://doi.org/10.1007/978-3-030-90858-4_5
- Diem, A. (2021). *Analyse von Studienverläufen und -erfolgsquoten im Kanton Aargau mit BFS-Daten: Kantonsbericht 2021*. Swiss Coordination Centre for Research in Education (SCCRE). <https://www.ag.ch/media/kanton-aargau/bks/ueber-uns/publikationen/bks-2021-kantonsbericht-studienverlaeufer-erfolgsquoten.pdf>
- Diem, A. (2024). *Analyse von Hochschulübertritten und Studienverläufen von Maturandinnen und Maturanden des Kantons Zug: Kantonsbericht 2024*. Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/publikationen/Analyse_der_Hochschuluebertritte_und_Studienverlaeufer_von_Maturandinnen_und_Maturanden_des_Kantons_Zug_17.12.2024.pdf
- Diem, A., Gschwendt, C., & Wolter, S. C. (2025). Assessing the value of incomplete university degrees: Experimental evidence from HR recruiters (IZA Discussion Paper No. 17693). Institute of Labor Economics (IZA). <https://docs.iza.org/dp17693.pdf>
- Diem, A. (2016). *Studienfachwechsel im Bologna-System* (SCCRE Staff Paper No. 17). Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/staffpaper/staffpaper_17_studienfachwechsel.pdf
- Diener, E., Lucas, R. E., & Oishi, S. (2018). Advances and open questions in the science of subjective well-being. *Collabra: Psychology*, 4(1), 15. <https://doi.org/10.1525/collabra.115>
- Diener, K., Götz, S., Schreyer, F., Stephan, G., Lenhart, J., Nisic, N., & Stöhr, J. (2015). *Rückkehr ins Berufsleben nach familienbedingter Unterbrechung* (IAB-Research report No. 7). Institut für Arbeitsmarkt- und Berufsforschung (IAB). <https://doku.iab.de/forschungsbericht/2015/fbo715.pdf>
- Dipierro, A. R., & De Witte, K. (2024). The underlying signals of efficiency in European universities: A combined efficiency and machine learning approach. *Studies in Higher Education*, 50(6), 1306–1325. <https://doi.org/10.1080/03075079.2024.2370948>
- Dlabac, O., Amrhein, A., & Hug, F. (2022). *School mixing: More equity through intelligent school zoning* (Study Reports of the Center for Democracy Studies Aarau No. 17). Zentrum für Demokratie Aarau (ZDA). https://villejuste.com/wp-content/uploads/2022/04/School_mixing_intelligent_school_zoning_report.pdf
- Donati, D., Durante, R., Sobbrío, F., & Zejicovic, D. (2025). Lost in the net? Broadband internet and youth mental health. *Journal of Health Economics*, 103. <https://doi.org/10.1016/j.jhealeco.2025.103017>
- Donnelly, R., & Patrinos, H. A. (2021). Learning loss during Covid19: An early systematic review. *Prospects*, 51, 601–609. <https://doi.org/10.1007/s11125-021-09582-6>
- Dorn, D., Schoner, F., Seebacher, M., Simon, L., & Woessmann, L. (2025). *Multidimensional skills on LinkedIn profiles: Measuring human capital and the gender skill gap* (IZA Discussion Paper No. 17896). Institute of Labor Economics (IZA). <https://doi.org/10.48550/arXiv.2409.18638>
- Dougan, W. R., García, J. L., & Polovnikov, I. (2023). *High-quality early-childhood education at scale: Evidence from a multisite randomized trial* (NBER Working Paper No. 31694). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w31694>
- Drange, N., & Sandsør, A. M. J. (2024). The effects of a free universal after-school program on child academic outcomes. *Economics of Education Review*, 98. <https://doi.org/10.1016/j.econedurev.2023.102504>
- Duchêne, C., Heers, M., & Bernardi, L. (2025). *All-day childcare and schooling* (Vol. 20, Number 1). Schweizerische Akademie der Geistes- und Sozialwissenschaften (SAGW). <https://zenodo.org/doi/10.5281/zenodo.14283689>
- Duckworth, A. (2016). *Grit: The power of passion and perseverance*. Scribner/Simon & Schuster. <https://angeladuckworth.com/grit-book/>
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087–1101. <https://doi.org/10.1037/0022-3514.92.6.1087>
- Duckworth, A., & Yeager, S. (2015). Measurement matters: Assessing personal qualities other than cognitive ability for educational purposes. *Educational Researcher*, 44(4). <https://doi.org/10.3102/0013189X15584327>
- DUK [German Commission for UNESCO] (2017). *Bildungsagenda 2030: Aktionsrahmen für die Umsetzung von Sustainable Development Goal 4*. DUK. https://www.unesco.de/assets/dokumente/Deutsche_UNESCO-Kommission/02_Publikationen/Publikation_Bildungsagenda_2030_Aktionsrahmen.pdf
- DUK [German Commission for UNESCO] (2021). *Bildung für nachhaltige Entwicklung: Eine Roadmap*. DUK. <https://unesdoc.unesco.org/ark:/48223/pfo000379488>
- Duncan, G., Kalil, A., Mogstad, M., & Rege, M. (2023). Chapter 1 – investing in early childhood development in preschool and at home. In E. A. Hanushek, S. Machin, & L. Woessmann (Eds.), *Handbook of the Economics of Education* (Vol. 6, p. 1–91). Elsevier. <https://doi.org/10.1016/bs.hesedu.2022.11.005>
- Dutrévis, M., Cecchini, A., & Ducrey, F. (2022). *Vivre la 1P: Regards croisés sur les difficultés de l'entrée en scolarité*. Service de la recherche en éducation (SRED). https://edudoc.ch/nanna/record/224397/files/Vivre_1P.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Dutrévis, M., Wettstein, J., & Spagnolo, T. (2024). *Évaluation du projet d'innovation pédagogique: EP21*. Service de la recherche en éducation (SRED). <https://www.ge.ch/document/34902/telecharger>
- EAER & EDK [Federal Department of Economic Affairs, Education and Research & Swiss Conference of Cantonal Ministers of Education]. (2015). *Chancen optimal nutzen: Erklärung 2015 zu den gemeinsamen bildungspolitischen Zielen für den Bildungsraum Schweiz*. EAER & EDK. <https://www.news.admin.ch/newsd/message/attachments/39420.pdf>
- EAER & EDK [Federal Department of Economic Affairs, Education and Research & Swiss Conference of Cantonal Ministers of Education]. (2019). *Chancen optimal nutzen: Erklärung 2019 zu den gemeinsamen bildungspolitischen Zielen für den Bildungsraum Schweiz*. EAER & EDK. <https://www.news.admin.ch/newsd/message/attachments/58299.pdf>
- EAER & EDK [Federal Department of Economic Affairs, Education and Research & Swiss Conference of Cantonal Ministers of Education]. (2023). *Chancen optimal nutzen: Erklärung 2023 zu den gemeinsamen*

- bildungspolitischen Zielen für den Bildungsraum Schweiz. EAER & EDK. <https://backend.sbf.admin.ch/fileservice/sdweb-docs-prod-sbft-estch-files/files/2025/04/03/9990e65c-700f-43e7-a877-2e6764a46a00.pdf>
- EAER, FDHA, & EDK [Federal Department of Economic Affairs, Education and Research; Federal Department of Home Affairs & Swiss Conference of Cantonal Ministers of Education]. (2017). *Schweizerische Strategie Austausch und Mobilität von Bund und Kantonen*. EAER, FDHA, & EDK. https://edudoc.ch/nanna/record/212831/files/AM_Strategie_20171102_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- Eberle, F. (2024). *Zulassung von Absolventen und Absolventinnen einer Berufsmatura zur Primarlehrerausbildung: Bericht/Gutachten zum Postulat WBK-N 22.4267 im Auftrag des Staatssekretariats für Bildung, Forschung und Innovation (SBFI)*. https://www.sbf.admin.ch/dam/de/sd-web/66H2tu-dmLod/zulassung_absolventen_berufsmatura_primarlehrerausbildung.pdf
- Eberle, F. (2025). *Studienerfolg und Studienabbruch an Hochschulen*. State Secretariat for Education, Research and Innovation (SERI). <https://backend.sbf.admin.ch/fileservice/sdweb-docs-prod-sbftestch-files/files/2025/07/07/16a839a4-108e-401c-a0fe-85806b8d7957.pdf>
- Eberle, F., Gehrler, K., Jaggi, B., Kottonau, J., Oepke, M., & Pflüger, M. (2008). *Evaluation der Maturitätsreform 1995 (EVAMAR). Schlussbericht zur Phase II*. State Secretariat for Education, Research and Innovation (SERI) and Swiss Conference of Cantonal Ministers of Education (EDK). https://edudoc.ch/nanna/record/29677/files/Web_Evamar-Komplett.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- Ecoplan. (2020). *Überblick zur Situation der familienergänzenden Betreuung in den Kantonen*. Ecoplan. <https://www.ag.ch/media/kanton-aargau/dgs/dokumente/gesellschaft/familie-gleichstellung/2020-10-07-ecoplan-feb-de-final.pdf>
- Ecoplan. (2022). *Positionierung höhere Fachschule: Auswertung der Befragung der Bildungsanbieter und Trägerschaften*. Ecoplan. https://www.fhschweiz.ch/customer/files/1162/2022-11-14_Bericht_Positionierung_HF_2022_DE.pdf
- Ecoplan. (2023). *Analyse und Bewertung kantonaler Systeme der familien- und schulergänzenden Kinderbetreuung*. Ecoplan. https://www.ecoplan.ch/download/mssg_sb_de.pdf
- Edelmann, D., Wannack, E., & Schneider, H. (2018). *Die Situation auf der Kindergartenstufe im Kanton Zürich: Eine empirische Studie im Auftrag der Bildungsdirektion des Kantons Zürich*. Pädagogische Hochschule Bern & Pädagogische Hochschule Zürich. https://phrepo.phbern.ch/429/1/studie_situation-auf-der-kindergartenstufe.pdf
- Edin, P.-A., Fredriksson, P., Nybom, M., & Öckert, B. (2022). The rising return to noncognitive skill. *American Economic Journal: Applied Economics*, 14(2), 78–100. <https://doi.org/10.1257/app.20190199>
- EDK [Swiss Conference of Cantonal Ministers of Education]. (1983). *Die Situation der Mehrklassenschulen in der Schweiz*. EDK. https://edudoc.ch/nanna/record/40849/files/Ergebnisbericht_SIPRI.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2004). *Sprachenunterricht in der obligatorischen Schule: Strategie der EDK und Arbeitsplan für die gesamtschweizerische Koordination*. EDK. https://edudoc.ch/nanna/record/30008/files/Sprachen_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2007). *Interkantonale Vereinbarung über die Harmonisierung der obligatorischen Schule (HarmoS-Konkordat)*. EDK. https://edudoc.ch/nanna/record/24711/files/HarmoS_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2011). *Grundkompetenzen für die Schulsprache*. EDK. https://edudoc.ch/nanna/record/96791/files/grundkomp_schulsprache_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2014a). *Obligatorische Schule: Schuleintritt und erste Jahre: Zusammenstellung von Studien, Projekten und Instrumenten in den Kantonen zur Flexibilisierung und Individualisierung sowie zur Sprachförderung und Sozialisation/Integration*. EDK. https://edudoc.ch/nanna/record/111988/files/schuleintritt_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2014b). *Standardisiertes Abklärungsverfahren (SAV)*. EDK. https://edudoc.ch/nanna/record/115392/files/SAV_d_web.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2015). *Empfehlungen zur Förderung der Landessprache Italienisch an den Schweizer Gymnasien*. EDK. https://edudoc.ch/nanna/record/116834/files/empf_ital_gym_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2018). *Rahmenlehrplan für Fachmittelschulen*. EDK. https://edudoc.ch/nanna/record/133116/files/FMS_rahmenlehrplan_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2019a). *Bilanz 2019: Harmonisierung der verfassungsmässigen Eckwerte (Art. 62 Abs. 4 BV) für den Bereich der obligatorischen Schule*. EDK. https://edudoc.ch/nanna/record/204713/files/Bilanz-Bericht_II_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2019b). *Massnahmen zur Digitalisierungsstrategie der EDK: EDK-Arbeitsplan zur Strategie vom 21. Juni 2018 für den Umgang mit Wandel durch Digitalisierung im Bildungswesen*. EDK. https://edudoc.ch/nanna/record/204727/files/massnahmen_digitalisierungsstrategie_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2022). *EDK-Empfehlungen zur Förderung der Landessprache Italienisch an den Schweizer Gymnasien; Ergebnisse der Zusatzbefragung der Kantone: Kenntnisnahme*. EDK. https://edudoc.ch/nanna/record/227169/files/PB281022_Italienisch_d.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK [Swiss Conference of Cantonal Ministers of Education]. (2024). *Monitoring der Grundkompetenzen; Anpassung des Organisationsreglements ÜGK und weiteres Vorgehen*. EDK. <https://edudoc.ch/nanna/record/235530/files/reglement-monitoring-grundkompetenzen.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1>
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2022). *Unterricht in heimatlicher Sprache und Kultur (HSK): Rechtliche Grundlagen inkl. Anhang mit Links zu weiterführenden Informationen*. EDK-IDES. https://edudoc.ch/nanna/record/224404/files/HSK_2022.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=2
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2023). *Qualitätssicherung und -entwicklung: Rechtliche Grundlagen*. EDK-IDES. https://edudoc.ch/nanna/record/229906/files/Dossier_2023.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024a). *Förderangebote für Begabte*. Retrieved 30 November 2024, from <https://www.cdep.ch/de/bildungssystem/kantonale-schulorganisation/kantonsumfrage/b-44-foerderangebote-begabte>
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024b). *Homeschooling*. Retrieved 10

- December 2024, from <https://www.edk.ch/de/bildungssystem/kantonale-schulorganisation/kantonsumfrage/d-15-homeschooling>
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024c). *Kindergarten-Obligatorium, effektiver Besuch*. Retrieved 26 February 2025, from <https://www.edk.ch/de/bildungssystem/kantonale-schulorganisation/kantonsumfrage/a11-kindergarten-obligatorium>
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024d). *Schülerinnen- und Schülerbeurteilung*. Retrieved 6 August 2025, from <http://www.edk.ch/de/bildungssystem/kantonale-schulorganisation/kantonsumfrage/b-31-schuelerbeurteilung>
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024e). *Schulübergreifende Kompetenztests*. Retrieved 10 December 2024, from <https://www.edk.ch/de/bildungssystem/kantonale-schulorganisation/kantonsumfrage/b-35-schuluebergreifende-kompetenztests>
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024f). *Studentafeln der Volksschule: Primarstufe und Sekundarstufe I Schuljahr 2024–2025*. EDK-IDES. https://edudoc.ch/nanna/record/237082/files/Studentafeln_Grilleshoraires_24-25.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=2
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024g). *Übertritt in allgemeinbildende Schulen der Sekundarstufe II (gymnasiale Maturitätsschule, Fachmittelschule): Rechtliche Grundlagen*. EDK-IDES. https://edudoc.ch/nanna/record/236040/files/2024_Dossier_Uebertritt_allgb_Schulen.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=2
- EDK-IDES [Swiss Conference of Cantonal Ministers of Education, Information and documentation centre]. (2024h). *Unterstützungspersonal an Schulen*. Retrieved 5 December 2024, from <https://www.edk.ch/de/bildungssystem/kantonale-schulorganisation/kantonsumfrage/c-4-unterstuetzungspersonal-an-schulen>
- Educa. (2021). *Digitalisierung in der Bildung*. Educa. https://www.educa.ch/sites/default/files/2021-10/Digitalisierung_in_der_Bildung.pdf
- éducation21. (2023). *BNE-Verständnis: Eine Arbeitsdefinition für éducation21*. éducation21. https://www.education21.ch/sites/default/files/uploads/pdf-d/bne/230615_BNE_Vollstaendige_Arbeitsdefinition_D.pdf
- éducation21. (2025). *Strategie 2025–2028*. éducation21. https://www.education21.ch/sites/default/files/uploads/pdf-d/250513_e21_Strategie_25-28_DE_2025-v02.pdf
- EEF [Education Endowment Foundation]. (2025). *Teaching assistant interventions*. Retrieved 30 June 2025, from <https://educationendowmentfoundation.org.uk/education-evidence/teaching-learning-toolkit/teaching-assistant-interventions>
- Eggenberger, C., & Backes-Gellner, U. (2023). IT skills, occupation specificity and job separations. *Economics of Education Review*, 92. <https://doi.org/10.1016/j.econedurev.2022.102333>
- El-Komboz, L. A., & Fackler, T. (2023). *Productivity spillovers among knowledge workers in agglomerations: Evidence from Github* (CESifo Working Paper No. 11 277). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.4600283>
- Elmiger, D., Siegenthaler, A., & Tunger, V. (2022). *Inventar des zweisprachigen Unterrichts in der Schweiz*. Institut für Mehrsprachigkeit. https://edudoc.ch/nanna/record/229237/files/Zweisprachige-Lehrgaenge_web.pdf?withWatermark=o&withMetadata=o&registerDownload=1&version=1
- Eloundou, T., Manning, S., Mishkin, P., & Rock, D. (2024). GPTs are GPTs: Labor market impact potential of LLMs. *Science*, 384(6702), 1306–1308. <https://doi.org/10.1126/science.adj0998>
- Elsas, S. (2021). *Direct and indirect utility of education. Causal effects of education on life satisfaction* (SSRN Scholarly Paper). Social Science Research Network (SSRN). <https://dx.doi.org/10.2139/ssrn.3976204>
- Elsenberger, F., & Kendzia, M. (2023). *Educational reforms and their positive externalities on the labor market* (IZA Discussion Paper No. 16 435). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4568744>
- Emmers, D., Caro, J. C., Rozelle, S., & Sylvia, S. (2022). Early parenting interventions to foster human capital in developing countries. *Annual Review of Resource Economics*, 14, 169–192. <https://doi.org/10.1146/annurev-resource-111220-010215>
- Engelhardt, C., & Lörz, M. (2021). Auswirkungen von Studienkosten auf herkunftsspezifische Ungleichheiten bei der Studienaufnahme und der Studienfachwahl. *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 73, 285–305. <https://doi.org/10.1007/s11577-021-00787-3>
- Enzi, B. (2017). *The effect of pre-service cognitive and pedagogical teacher skills on student achievement gains: Evidence from German entry screening exams* (Ifo Working Paper No. 243). Leibniz Institute for Economic Research (ifo). <https://hdl.handle.net/10.419/176863>
- Epp, A. (2018). Subjektive Theorien von Lehrkräften über ungünstige Faktoren in der Bildungsbiografie von Schülerinnen und Schülern – wie konstruieren Lehrkräfte den Übergang von der Schule in die Berufsausbildung? *Zeitschrift für Erziehungswissenschaft*, 21, 973–990. <https://doi.org/10.1007/s11618-018-0814-2>
- Eppelsheimer, J., Jahn, E. J., & Rust, C. (2022). The spatial decay of human capital externalities – a functional regression approach with precise geo-referenced data. *Regional Science and Urban Economics*, 95, 103785. <https://doi.org/10.1016/j.regsciurbeco.2022.103785>
- Erdmann, M., Schneider, J., Pietrzyk, I., Jacob, M., & Helbig, M. (2023). The impact of guidance counselling on gender segregation: Major choice and persistence in higher education. An experimental study. *Frontiers in Sociology*, 8. <https://doi.org/10.3389/fsoc.2023.1154138>
- Erzinger, A. B., Angelone, D., Locher, F. M., Prosperi, O., Salvisberg, Miriam, & Tomasik, M. J. (2025). *Nationaler Bericht zu der Überprüfung des Erreichens der Grundkompetenzen (ÜGK) 2023, Sprachen II. Schuljahr: Ein Beitrag zum Schweizer Bildungsmonitoring*. Interfaculty Centre for Educational Research (ICER), University of Bern. <https://doi.org/10.48620/85368>
- Erzinger, A. B., Pham, G., Prosperi, O., & Salvisberg, M. (2023). *PISA 2022. Die Schweiz im Fokus*. University of Bern. <https://www.pisa-schweiz.ch/PISA2022-DieSchweizimFokus.pdf>
- Eshaghnia, S. S. M., Heckman, J. J., Landersø, R., & Qureshi, R. (2024). *Transmission of family influence* (NBER Working Paper No. 33 023). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33023>
- Eurydice. (2025). *Key data on early childhood education and care in Europe*. European Education and Culture Executive Agency (EACEA). <https://data.europa.eu/doi/10.2797/66224>
- Fairlie, R. W., Oliver, D. M., Millhauser, G., & Roland, R. (2024). *Estimating peer effects among college students: Evidence from a field experiment of one-to-one pairings in STEM* (NBER Working Paper No. 33 060). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w33060>
- Falck, O., Guo, Y. M., Langer, C., Lindlacher, V., & Wiederhold, S. (2024). *Firm training, automation, and wages: Worker-level evidence* (CESifo Working Paper No. 11 533). Center for Economic Studies (CESifo). https://www.ifo.de/DocDL/cesifo1_wp11533.pdf
- Falk, A., Becker, A., Dohmen, T., Enke, B., Huffman, D., & Sunde, U. (2018). Global evidence on economic preferences. *The Quarterly Journal of Economics*, 133(4), 1645–1692. <https://doi.org/10.1093/qje/qjy013>
- Fan, M., Jin, Y., & Zhang, M. (2023). Genetic risk, childhood obesity, and educational achievements. *Economics of Education Review*, 94. <https://doi.org/10.1016/j.econedurev.2023.102408>

- Farrington, D., Bergström, H., & Jolliffe, D. (2023). Childhood predictors of successful self-reported delinquents. *Psychology, Crime & Law*, 31(3), 249–269. <https://doi.org/10.1080/1068316X.2023.2228972>
- Fasseing Heim, K., Rohde, S., & Isler, D. (2018). StarTG – mit jungen Kindergartenkindern starten im Kanton Thurgau. *Jahresbericht Forschung 2016/2017*. <https://doi.org/10.57668/phtg-000374>
- FDFA [Federal Department of Foreign Affairs]. (2020). SDG 4: *Hochwertige Bildung*. Retrieved 6 August 2025, from <https://www.agenda-2030.eda.admin.ch/de/sdg-4-hochwertige-bildung>
- Federal Council. (2021). *Politik der frühen Kindheit: Auslegeordnung und Entwicklungsmöglichkeiten auf Bundesebene*. Federal Council. <https://www.bsv.admin.ch/dam/de/sd-web/wu9XcLuTpKaD/br-bericht-fruehe-kindheit.pdf>
- Federal Council. (2022a). *Erhalt und Schaffung von Lehrstellen – Erfolgsfaktoren und Herausforderungen*. Federal Council. https://edudoc.ch/nanna/record/228937/files/bericht-lehrstellen_d.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Federal Council. (2022b). *Frühe Sprachförderung in der Schweiz: Bericht des Bundesrates in Erfüllung der Motion 183834 Eymann vom 25. September 2018*. Federal Council. <https://www.parlament.ch/centers/eparl/curia/2018/20183834/Bericht%20BR%20D.pdf>
- Federal Council. (2023). *Bildung für nachhaltige Entwicklung in der obligatorischen Schule: Bericht des Bundesrates in Erfüllung des Postulats 193764 Romano vom 20. Juni 2019*. Federal Council. https://www.sbf.admin.ch/dam/de/sd-web/qMO9w3QkoIEv/bericht_po_19_3764_marco_romano_de.pdf
- Federal Council. (2024). *Datenlage zu den Kompetenzen von Geflüchteten: Bericht des Bundesrates in Erfüllung des Postulats 223393 der WBK-N vom 29. April 2022*. Federal Council. <https://www.parlament.ch/centers/eparl/curia/2022/20223393/Bericht%20BR%20D.pdf>
- Federal Council. (2025). *Zulassung von Absolventen und Absolventinnen einer Berufsmatura zur Primarlehrerausbildung: Bericht des Bundesrates in Erfüllung des Postulats 22.4267 WBK-N vom 28. Oktober 2022*. Federal Council. <https://www.parlament.ch/centers/eparl/curia/2022/20224267/Bericht%20BR%20D.pdf>
- Felouzis, G., & Charmillot, S. (2023). Tracking and educational inequality: A longitudinal analysis of two school reforms in Switzerland. *British Journal of Sociology of Education*, 44(4), 738–763. <https://doi.org/10.1080/01425692.2023.2203359>
- Felten, E. W., Raj, M., & Seamans, R. (2023). *Occupational heterogeneity in exposure to generative AI* (SSRN Scholarly Paper). Social Science Research Network. <https://dx.doi.org/10.2139/ssrn.4414065>
- Ferguson, C. J., Kaye, L. K., Branley-Bell, D., & Markey, P. (2025). There is no evidence that time spent on social media is correlated with adolescent mental health problems: Findings from a meta-analysis. *Professional Psychology: Research and Practice*, 56(1), 73–83. <https://doi.org/10.1037/pro0000589>
- Festner, D., Gröschner, A., Goller, M., & Hascher, T. (2020). Lernen zu Unterrichten – Veränderungen in den Einstellungsmustern von Lehramtsstudierenden während des Praxissemesters im Zusammenhang mit mentorieller Lernbegleitung und Kompetenzeinschätzung. In I. Ulrich & A. Gröschner (Eds.), *Praxissemester im Lehramtsstudium in Deutschland: Wirkungen auf Studierende* (p. 209–241). Springer Fachmedien. https://doi.org/10.1007/978-3-658-24209-1_7
- Figlio, D., Freese, J., Karbownik, K., & Roth, J. (2017). Socioeconomic status and genetic influences on cognitive development. *Proceedings of the National Academy of Sciences*, 114(51), 13441–13446. <https://doi.org/10.1073/pnas.1708491114>
- Figlio, D., Giuliano, P., Özek, U., & Sapienza, P. (2019). Long-term orientation and educational performance. *American Economic Journal: Economic Policy*, 11(4), 272–309. <https://doi.org/10.1257/pol.20180374>
- Figlio, D., Karbownik, K., & Özek, U. (2023). *Sibling spillovers may enhance the efficacy of targeted school policies* (NBER Working Paper No. 31406). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w31406>
- Filges, T., Sonne-Schmidt, C. S., & Nielsen, B. C. V. (2018). Small class sizes for improving student achievement in primary and secondary schools: A systematic review. *Campbell Systematic Reviews*, 14(1), 1–107. <https://doi.org/10.4073/csr.2018.10>
- Findeisen, S., Jüttler, A., Neuenschwander, M. P., & Schumann, S. (2022). Transition from school to work – explaining persistence intention in vocational education and training in Switzerland. *Vocations and Learning*, 15, 129–154. <https://doi.org/10.1007/s12186-021-09282-4>
- Fleischmann, M., Hübner, N., Nagengast, B., & Trautwein, U. (2023). The dark side of detracking: Mixed-ability classrooms negatively affect the academic self-concept of students with low academic achievement. *Learning and Instruction*, 86. <https://doi.org/10.1016/j.learninstruc.2023.101753>
- Fletcher, J. M., Lu, Q., Mazumder, B., & Song, J. (2023). *Understanding sibling correlations in education: Molecular genetics and family background* (IZA Discussion Paper No. 15862). Institute of Labor Economics (IZA). <https://hdl.handle.net/10419/272489>
- Freeman, R. B. (1986). Demand for education. In O. Ashenfelter & R. Layard (Eds.), *Handbook of labor economics* (p. 357–386). Elsevier. [https://doi.org/10.1016/S1573-4463\(86\)01009-X](https://doi.org/10.1016/S1573-4463(86)01009-X)
- Freisler-Mühlemann, D., Schafer, Y., & Winkler, A. (2021). Unterrichtsplannung in der Berufseinstiegsphase: Relevante personale und soziale Ressourcen. *Schweizerische Zeitschrift für Bildungswissenschaften*, 43(1), 139–153. <https://doi.org/10.24452/sjer.43.1.11>
- Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological Forecasting and Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
- Frey, M., & Meier, H. (2022). *Strukturelle Merkmale des HF-Systems: Teil 2: Finanzierung und Kompetenzen*. BSS Volkswirtschaftliche Beratung AG. https://bss-basel.ch/files/berichte/BSS_Strukturelle-Merkmale-HF-System_Teil_2.pdf
- Frisvold, D. E., & Kim, S. (2024). *Recessions and the labor market returns to cognitive and social skills* (IZA Discussion Paper No. 16746). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4704288>
- FSIO [Federal Social Insurance Office]. (2025). *Bildung und Armut in der Schweiz. Armutsmonitoring der Schweiz. Bericht 2025*. FSIO. https://www.armutsmonitoring.ch/dam/de/sd-web/DqoEd-plOWEf/AM_Schwerpunktheft_Bildung_2025_de.pdf
- FSO [Federal Statistical Office]. (2005). *Grundkompetenzen von Erwachsenen: Erste Ergebnisse der ALL-Erhebung (Adult Literacy and Lifeskills)*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/342062/master>
- FSO [Federal Statistical Office]. (2015). *Internationale Standardklassifikation für Bildung (ISCED 2011)*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/248786/master>
- FSO [Federal Statistical Office]. (2019). *Statistik der Sonderpädagogik: Schuljahr 2017/18*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/10227899/master>
- FSO [Federal Statistical Office]. (2020a). *Statistik der Sonderpädagogik: Schuljahr 2018/19*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/14776871/master>
- FSO [Federal Statistical Office]. (2020b). *Teilzeitstudierende an den Schweizer Hochschulen*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/11927395/master>
- FSO [Federal Statistical Office]. (2021a). *Studien- und Lebensbedingungen an den Schweizer Hochschulen: Hauptbericht der Erhebung 2020 zur sozialen und wirtschaftlichen Lage der Studierenden*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/18584280/master>
- FSO [Federal Statistical Office]. (2021b). *Übergänge und Verläufe in der obligatorischen Schule: Längsschnitanalysen im Bildungsbereich*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/16804389/master>

- FSO [Federal Statistical Office]. (2022a). *Anteil der familienergänzend betreuten Kinder im Alter von 0–12 Jahren*. Retrieved 18 June 2025, from <https://www.bfs.admin.ch/asset/de/31786778>
- FSO [Federal Statistical Office]. (2022b). *Berufliche Situation von Absolventinnen und Absolventen der höheren Berufsbildung 2020, vier Jahre nach dem Abschluss: Ergebnisse der Erhebung zur höheren Berufsbildung des Prüfungsjahrgangs 2016*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/22684435/master>
- FSO [Federal Statistical Office]. (2022c). *Lebenslanges Lernen in der Schweiz: Ergebnisse des Mikrozensus Aus- und Weiterbildung 2021*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/23284603/master>
- FSO [Federal Statistical Office]. (2022d). *Verbleib der Lehrkräfte an der obligatorischen Schule*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/22864238/master>
- FSO [Federal Statistical Office]. (2023a). *Einkommensentwicklung von Absolventinnen und Absolventen der höheren Berufsbildung*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/23825796/master>
- FSO [Federal Statistical Office]. (2023b). *Kursanbieter und Kurse, die zu einem Bundesbeitrag berechtigen, 2017 bis 2021*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/24586129/master>
- FSO [Federal Statistical Office]. (2023c). *Praktika während des Studiums*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/27685009/master>
- FSO [Federal Statistical Office]. (2023d). *Verläufe der Postdoktorandinnen und Postdoktoranden*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/25345567/master>
- FSO [Federal Statistical Office]. (2024a). *Alle FH: Referenzszenario*. Retrieved 7 July 2025, from <https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/szenarien-bildungssystem/hochschule-studierende/fachhochschulen.assetdetail.32567490.html>
- FSO [Federal Statistical Office]. (2024b). *Alle UH: Referenzszenario*. Retrieved 7 July 2025, from <https://www.bfs.admin.ch/bfs/de/home.assetdetail.32567489.html>
- FSO [Federal Statistical Office]. (2024c). *Arbeitgeberunterstützte Weiterbildung*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/29765663/master>
- FSO [Federal Statistical Office]. (2024d). *Bevölkerungsstand am Ende des 2. Quartals 2024*. Retrieved 26 May 2025, from <https://www.bfs.admin.ch/news/de/2024-0538>
- FSO [Federal Statistical Office]. (2024e). *Bildungsverläufe an den Höheren Fachschulen*. Retrieved 21 March 2025, from <https://www.bfs.admin.ch/asset/de/32567395>
- FSO [Federal Statistical Office]. (2024f). *Bildungsverläufe auf Sekundarstufe II*. Retrieved 7 February 2025, from <https://www.bfs.admin.ch/asset/de/33006258>
- FSO [Federal Statistical Office]. (2024g). *Bildungsverläufe der 16-25-jährigen Personen aus dem Asylbereich*. Retrieved 27 January 2025, from <https://www.bfs.admin.ch/news/de/2024-0552>
- FSO [Federal Statistical Office]. (2024h). *Die Ausbildungssituation der Kandidatinnen und Kandidaten der höheren Berufsbildung: Erste Ergebnisse der Erhebung zur höheren Berufsbildung 2023*. FSO. <https://doi.org/10.71668/f3e9-qf89>
- FSO [Federal Statistical Office]. (2024i). *Die Bevölkerung der Schweiz ist 2023 stark gewachsen*. Retrieved 25 June 2025, from <https://www.bfs.admin.ch/asset/de/30709870>
- FSO [Federal Statistical Office]. (2024j). *Die Entwicklung der erwerbstätigen Bevölkerung in den letzten 50 Jahren: Demografie, Teilzeiterwerbstätigkeit und Berufe*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/32373780/master>
- FSO [Federal Statistical Office]. (2024k). *Die Wege der Postdoktoranden: Eintretende in das Postdoktorat von 2015 acht Jahre nach dem Eintritt*. Retrieved 8 November 2024, from <https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/uebertritte-verlaeuft-bildungsbereich/hochschulpersonal.html>
- FSO [Federal Statistical Office]. (2024l). *Erhebung zu Familien und Generationen 2023*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/32646267/master>
- FSO [Federal Statistical Office]. (2024m). *Gesundheit: Taschenstatistik 2024*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/30465879/master>
- FSO [Federal Statistical Office]. (2024n). *Kantonale Stipendien und Darlehen*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/32332915/master>
- FSO [Federal Statistical Office]. (2024o). *Lese-, Alltagsmathematik- und Problemlösekompetenzen von Erwachsenen in der Schweiz: Erste Resultate der PIAAC-Erhebung 2022/2023*. FSO. <https://doi.org/10.71668/bnax-8486>
- FSO [Federal Statistical Office]. (2024p). *Nachobligatorische Bildung: Starker Anstieg der Anzahl Lernenden und Studierenden bis 2033 erwartet*. Retrieved 24 January 2025, from <https://www.bfs.admin.ch/bfs/de/home/aktuell/neue-veroeffentlichungen.assetdetail.32589563.html>
- FSO [Federal Statistical Office]. (2024q). *Räumliche Mobilität von Diplomierten einer Höheren Fachschule 2017–2021*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/30887095/master>
- FSO [Federal Statistical Office]. (2024r). *Schlafstörungen in der Bevölkerung (Statistik der Schweiz)*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/32290000/master>
- FSO [Federal Statistical Office]. (2024s). *Standardisiertes monatliches Bruttoerwerbseinkommen vier Jahre nach Abschluss der höheren Berufsbildung*. Retrieved 7 January 2025, from <https://www.bfs.admin.ch/asset/de/33368918>
- FSO [Federal Statistical Office]. (2024t). *Zunahme der Jugendurteile, weniger Erwachsenenurteile im Jahr 2023*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/31445072/master>
- FSO [Federal Statistical Office]. (2024u). *Nichtteilnahme an Weiterbildung*. FSO. <https://dam-api.bfs.admin.ch/hub/api/dam/assets/30305516/master>
- FSO [Federal Statistical Office]. (2024v). *Öffentliche Bildungsausgaben nach Bildungsstufe, Ausgabenart und Verwaltungsebene*. Retrieved 8 July 2025, from <https://www.bfs.admin.ch/asset/de/33307857>
- FSO [Federal Statistical Office]. (2025a). *Erwerbslosenquote gemäss ILO ein Jahr nach Abschluss der höheren Berufsbildung*. Retrieved 20 June 2025, from <https://www.bfs.admin.ch/asset/de/34747915>
- FSO [Federal Statistical Office]. (2025b). *Geburten*. Retrieved 14 January 2025, from <https://www.bfs.admin.ch/bfs/de/home/statistiken/bevoelkerung/geburten-todesfaelle/geburten.html>
- FSO [Federal Statistical Office]. (2025c). *Internationale Vergleiche: Familienergänzende Kinderbetreuung*. Retrieved 18 June 2025, from <https://www.bfs.admin.ch/content/bfs/de/home/statistiken/bevoelkerung/familien/internationale-vergleiche.html>
- FSO [Federal Statistical Office]. (2025d). *Lernende nach Bildungsstufe und Bildungstyp, Entwicklung*. Retrieved 14 July 2025, from <https://www.bfs.admin.ch/asset/de/34107689>
- FSO [Federal Statistical Office]. (2025e). *Sonderpädagogik*. Retrieved 14 July 2025, from <https://www.bfs.admin.ch/content/bfs/de/home/statistiken/bildung-wissenschaft/personen-ausbildung/obligatorische-schule/sonderpaedagogik.html>
- FSO [Federal Statistical Office]. (2025f). *Soziale und wirtschaftliche Lage der Studierenden*. Retrieved 2 July 2025, from <https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/personen-ausbildung/tertiarstufe-hochschulen/soziale-wirtschaftliche-lage-studierenden.html>
- FSO [Federal Statistical Office]. (2025g). *Szenarien 2024–2033 für das Bildungssystem*. FSO. <https://doi.org/10.71668/xpbj-pf53>
- FSO [Federal Statistical Office]. (2025h). *Szenarien 2024–2033 für die Sekundarstufe II – Lernende und Abschlüsse*. Retrieved 31 January 2025,

- from <https://www.bfs.admin.ch/content/bfs/de/home/statistiken/bildung-wissenschaft/szenarien-bildungssystem/sekundarstufe-II-le-rnende.html>
- FSO [Federal Statistical Office]. (2025). *Übergänge und Verläufe in der obligatorischen Schule*. Retrieved 26 February 2025, from <https://www.bfs.admin.ch/content/bfs/de/home/statistiken/bildung-wissenschaft/uebertritte-verlaeuft-bildungsbereich/obligatorische-schule.html>
- Fukushima, N., von Hinke, S., & Sørensen, E. (2024). *The long-term human capital and health impacts of a pollution reduction programme* (IZA Discussion Paper No. 17 205). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4926523>
- Fumarco, L., Vandromme, A., Halewyck, L., & Baert, S. (2022). *Does relative age affect speed and quality of transition from school to work?* (IZA Discussion Paper No. 14 977). Institute of Labor Economics (IZA). <https://docs.iza.org/dp14977.pdf>
- Gachet, E., & Zumbühl, P. (2021). *So viel kostet ein Kitaplatz in der Schweiz*. Credit Suisse AG, Investment Solutions & Products. <https://edudoc.ch/nanna/record/219735/files/studie-kinderbetreuungskosten-mai-2021-de.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1>
- Garcez, L., Padilla-Romo, M., Peluffo, C., & Pineda-Torres, M. (2025). Improvements in schooling opportunities and teen births. *Journal of Economic Behavior & Organization*, 236. <https://doi.org/10.1016/j.jebo.2025.107120>
- García, J. L., & Heckman, J. J. (2023). Parenting promotes social mobility within and across generations. *Annual Review of Economics*, 15, 349–388. <https://doi.org/10.1146/annurev-economics-021423-031905>
- García, J. L., Heckman, J. J., & Ronda, V. (2023). The lasting effects of early-childhood education on promoting the skills and social mobility of disadvantaged African Americans and their children. *Journal of Political Economy*, 131(6), 1477–1506. <https://doi.org/10.1086/722936>
- Geers, S., Boukes, M., & Moeller, J. (2020). Bridging the gap? The impact of a media literacy educational intervention on news media literacy, political knowledge, political efficacy among lower-educated youth. *Journal of Media Literacy Education*, 12(2), 41–53. <https://doi.org/10.23860/JMLE-2020-12-2-4>
- Gehret, A., Aeppli, M., Kuhn, A., & Schweri, J. (2019). *Lohnt sich die Lehrlingsausbildung für die Betriebe? Resultate der vierten Kosten-Nutzen-Erhebung*. Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/obs_ehb_bericht_kosten-nutzen.pdf
- Gehret, A., Kuhn, A., & Schweri, J. (2025). *Lohnt sich die Ausbildung von Lernenden? Kosten, Nutzen und Ausbildungsqualität aus Sicht der Betriebe 2025*. Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/2025-11/EHB_Kosten-Nutzen_2025.pdf
- Gehrsitz, M., & Williams Jr, M. (2024). *The effects of compulsory schooling on health and hospitalization over the life cycle* (IZA Discussion Paper No. 17 050). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4856929>
- Gensowski, M., & Görtz, M. (2024). The education-health gradient: Revisiting the role of socio-emotional skills. *Journal of Health Economics*, 97. <https://doi.org/10.1016/j.jhealeco.2024.102911>
- Gershenson, S., Holt, S., & Tyner, A. (2023). Making the grade: The effect of teacher grading standards on student outcomes. *Contemporary Economic Policy*, 42(2), 305–318. <https://doi.org/10.1111/coep.12637>
- Getto, B. (2022). Die Rolle von Strategien für die Digitalisierung an Höheren Fachschulen. In D. Bach, E. Habermeth, & S. Osbahr (Eds.), *Höhere Fachschulen in der Schweiz. Herausforderungen und Perspektiven* (Vol. 12). hep Verlag. <https://doi.org/10.36933/978303521849>
- Ghassemi Tabrizi, N. (2024). *Evaluation eines Lehramtsmasterstudiengangs mit dem Profil Quereinstieg im Fach Physik: Erkenntnisse zu Ein-gangsbedingungen, professionellen Kompetenzen und Aspekten individuel-ler Angebotsnutzung* [Dissertation, Freie Universität Berlin]. <https://doi.org/10.25656/01:33470>
- Ghignoni, E., Croce, G., & d'Ambrosio, A. (2019). University dropouts vs high school graduates in the school-to-work transition: Who is doing better? *International Journal of Manpower*, 40(3), 449–472. <https://doi.org/10.1108/IJM-02-2018-0051>
- Giani, M. S., Attewell, P., & Walling, D. (2020). The value of an incomplete degree: Heterogeneity in the labor market benefits of college non-completion. *The Journal of Higher Education*, 91(4), 514–539. <https://doi.org/10.1080/00221546.2019.1653122>
- Gil-Hernández, C. J., Pañeda-Fernández, I., Salazar, L., & Castaño Muñoz, J. (2024). *Teacher bias in assessments by student ascribed status: A factorial experiment on discrimination and cultural reproduction* (JRC Working Papers Series on Social Classes in the Digital Age No. RC136 851). European Commission. <https://publications.jrc.ec.europa.eu/repository/handle/JRC136851>
- Girsberger, E. M., Koomen, M., & Krapf, M. (2022). Interpersonal, cognitive, and manual skills: How do they shape employment and wages? *Labour Economics*, 78. <https://doi.org/10.1016/j.labeco.2022.102235>
- Giuliano, R., Mahy, B., Rycx, F., & Vermeylen, G. (2024). *Overeducation, overskilling and job satisfaction in Europe: The moderating role of employment contracts* (IZA Discussion Paper No. 16 913). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4790781>
- Givord, P. (2020). *Do boys and girls have similar attitudes towards competition and failure?* (PISA in Focus No. 105). Organisation for Economic Cooperation and Development (OECD). <https://doi.org/10.1787/a8898906-en>
- Glauser, D., & Becker, R. (2023). Gendered ethnic choice effects at the transition to upper secondary education in Switzerland. *Frontiers in Sociology*, 8. <https://doi.org/10.3389/fsoc.2023.1158071>
- Goastellec, G. (2022). Ethnicity on top of social class? Inclusion and diversity in access to higher education degrees in Europe (1950–2010). *European Journal of Education*, 57(2), 218–234. <https://doi.org/10.1111/ejed.12505>
- Goehausen, J., & Thomsen, S. L. (2024). *Early career effects of entering the labor market during higher education expansion* (IZA Discussion Paper No. 17 487). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=5041933>
- Goldberg, L. R. (1990). An alternative «description of personality»: The Big-Five factor structure. *Journal of Personality and Social Psychology*, 59(6), 1216–1229. <https://doi.org/10.1037/0022-3514.59.6.1216>
- Golder, L., Mousson, M., Doriot, A., Burgunder, T., Pagani, A., & Rey, R. (2023). *Nahtstellenbarometer 2023: Zentrale Ergebnisse August 2023*. gfs.bern. <https://cockpit.gfsbern.ch/de/cockpit/nahtstellenbarometer-2023-august/>
- Golder, L., Mousson, M., Doriot, A., Burgunder, T., Pagani, A., & Rey, R. (2024). *Nahtstellenbarometer 2024: Zentrale Ergebnisse August 2024*. gfs.bern. <https://cockpit.gfsbern.ch/de/cockpit/nahtstellenbarometer-2024-august/>
- Golder, L., Mousson, M., Pepe, A., Pagani, A., & Rey, R. (2025). *Nahtstellenbarometer 2025: Zentrale Ergebnisse März/April 2025*. gfs.bern. <https://cockpit.gfsbern.ch/de/cockpit/nahtstellenbarometer-2025/>
- Goller, D., Diem, A., & Wolter, S. C. (2023). Sitting next to a dropout: Academic success of students with more educated peers. *Economics of Education Review*, 93. <https://doi.org/10.1016/j.econedurev.2023.102372>
- Goller, D., Graf, C., & Wolter, S. C. (2024). *The virtues of going virtual* (Economics of Education Working Paper Series No. 224). Swiss Leading House VPET-ECON. http://repec.business.uzh.ch/RePEc/iso/leadinghouse/0224_lhwpaper.pdf
- Goller, D., Gschwendt, C., & Wolter, S. C. (2025). This time it's different – generative artificial intelligence and occupational choice. *Labour Economics*. <https://doi.org/10.1016/j.labeco.2025.102746>

- Goller, D., & Wolter, S. C. (2025). Reaching for gold! The impact of a positive reputation shock on career choice. *European Economic Review*, 175. <https://doi.org/10.1016/j.euroecorev.2025.105017>
- Golsteyn, B. H. H., Grönqvist, H., & Lindahl, L. (2014). Adolescent time preferences predict lifetime outcomes. *The Economic Journal*, 124(580), F739–F761. <https://doi.org/10.1111/eoj.12095>
- Golsteyn, B. H. H., Non, A., & Zölitz, U. (2021). The impact of peer personality on academic achievement. *Journal of Political Economy*, 129(4), 1052–1099. <https://doi.org/10.1086/712638>
- Gomensoro, A., Heers, M., Kamm, C., & Hupka-Brunner, S. (2025). The impact of tracking in a stratified education system on idealistic educational aspirations in migrant and native families. *Research in Social Stratification and Mobility*, 97. <https://doi.org/10.1016/j.rssm.2025.101022>
- Gonon, P., Schmitz, M. L., Petko, D., & Consoli, T. (2024). Von der Digitalisierung zur digitalen Transformation. *Transfer. Berufsbildung in Forschung und Praxis*, 9(1). <https://transfer.vet/von-der-digitalisierung-zur-digitalen-transformation/>
- Gopalan, M., & Edara, R. (2023). Health policies as education policies? A review of causal evidence and mechanisms. *AERA Open*, 9. <https://doi.org/10.1177/23328584231177616>
- Goulas, S., Griselda, S., Megalokonomou, R., & Zenou, Y. (2024). *Disruptive peers and academic performance: Short and long-term outcomes* (CESifo Working Paper No. 11568). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.5073305>
- Graf, L., Aeschlimann, B., Hänni, M., Kriesi, I., Neumann, J., Pusterla, F., Schweri, J., & Strebel, A. (2024). *Qualifikationsverfahren auf dem Prüfstand* (Trendbericht No. 6). Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/2024-09/Trendbericht_2024_DE.pdf
- Grasso, M., & Giugni, M. (2022). Intra-generational inequalities in young people's political participation in Europe: The impact of social class on youth political engagement. *Politics*, 42(1), 13–38. <https://doi.org/10.1177/02633957211031742>
- Gray-Lobe, G., Pathak, P. A., & Walters, C. R. (2023). The long-term effects of universal preschool in Boston. *The Quarterly Journal of Economics*, 138(1), 363–411. <https://doi.org/10.1093/qje/qjac036>
- Graziosi, G., Sneyers, E., Agasisti, T., & De Witte, K. (2021). Can grants affect student performance? Evidence from five Italian universities. *Journal of Higher Education Policy and Management*, 43(1), 24–48. <https://doi.org/10.1080/1360080X.2020.1737343>
- Greber, L., Sahli Lozano, C., & Steiner, F. (2017). Lehrpersoneneinschätzungen von Kindern mit integrativen schulischen Massnahmen. In M. Trautnschig & S. Schwab (Eds.), *Diversität – Inklusion und Exklusion im Kontext Schule. Empirische Pädagogik* 31: Vol. 31 (3) (p. 303–322). Verlag Empirische Pädagogik. <https://phrepo.phbern.ch/634/1/GreberL2017.pdf>
- Gremion, L., & Monney, C. (2021). *Analyse de situations de perturbation scolaire dans les cantons romands: Questionnements, récurrences, variations et dispositifs de réponse*. Conférence intercantonale de l'instruction publique et de la culture de la Suisse romande et du Tessin (CIIP). https://www.irdp.ch/data/secure/3532/document/CIIP_man-dat_analyse_situations_perturbation.pdf
- Grob, A., Keller, K., & Trösch, L. (2014). *Zweitsprache: Mit ausreichenden Deutschkenntnissen in den Kindergarten*. University of Basel. https://www.otb-consulting.ch/dam/jcr:6e9bc8c9-011f-46e0-82a3-b091897891b7/studie_universitaet_basel_2014.pdf
- Grob, A., Schächinger Tenés, L. T., Bühler, J. C., & Segerer, R. K. (2019). *Erste Erkenntnisse zur Wirksamkeit früher obligatorischer Sprachdiagnostik- und Sprachfördermassnahmen bei Kindern mit Deutsch als Zweitsprache*. University of Basel. <https://edoc.unibas.ch/server/api/core/bitstreams/8a377107-23f0-43bb-b0f6-ff9d79b04a6b/content>
- Gromada, A., & Richardson, D. (2021). *Where do rich countries stand on childcare?* United Nations Children's Fund (UNICEF). <https://www.unicef.org/innocenti/media/5431/file/UNICEF-Where-Do-Rich-Countries-Stand-on-Childcare-2021.pdf>
- Grønning, M., & Kriesi, I. (2022). Skill endowment through vocational education and training programmes and early career mobility. *Social Inclusion*, 10(4), 115–128. <https://doi.org/10.17645/si.v10i4.5786>
- Grootendorst, N., Steegers-Theunissen, R. M. P., & Jaddoe. (2025). *Brighter children? The association between seasonality of birth and child IQ in a population-based birth cohort*. <https://doi.org/10.1136/bmjopen-2016-012406>
- Gröschner, A., & de Zordo, L. (2021). Lehrerbildung in der Hochschule. In T. Hascher, T.-S. Idel, & W. Helsper (Eds.), *Handbuch Schulforschung* (p. 1–20). Springer Fachmedien. https://doi.org/10.1007/978-3-658-24734-8_58-1
- Gschwendt, C. (2022). Routine job dynamics in the Swiss labor market. *Swiss Journal of Economics and Statistics*, 158. <https://doi.org/10.1186/s41937-022-00103-6>
- Guilley, E., Valarino, I., Dutrévis, M., & Jendoubi, V. (2023). *La mise en œuvre du concordat de la pédagogie spécialisée à Genève: De la difficulté à changer de paradigme*. Service de la recherche en éducation (SRED). <https://www.ge.ch/document/34024/telecharger>
- Guo, G., Lin, M.-J., & Harris, K. M. (2022). Socioeconomic and genomic roots of verbal ability from current evidence. *Npj Science of Learning*, 7(1), 1–15. <https://doi.org/10.1038/s41539-022-00137-8>
- Guo, J., Roys, N. A., & Seshadri, A. (2024). *Estimating aggregate human capital externalities* (NBER Working Paper No. 33151). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w33151>
- Gust, S. (2024). *(Not) going to school in times of climate change: Natural disasters and student achievement* (Ifu Working Paper Series No. 413). Leibniz Institute for Economic Research (ifo). <https://www.ifo.de/DocDL/wp-2024-413-gust-natural-disasters.pdf>
- Haering, B., Leimgruber, V., & Lügstenmann, M. (2023). *Prekarität, Gleichstellung und akademischer Nachwuchs im Mittelbau an Schweizer Hochschulen: Bestandsaufnahme*. econcept. <https://backend.sbf.admin.ch/fileservice/sdweb-docs-prod-sbfitestch-files/files/2025/05/15/e0369c72-fe12-4f24-841c-7eb4a5d15797.pdf>
- Hafner, S. (2022). *Koordination und Kompromiss in föderalen Bildungssystemen: Umkämpfte Institutionalisierung eines neuen Zugangswegs zur Lehrpersonenbildung*. Springer Nature. <https://link.springer.com/content/pdf/10.1007/978-3-658-36193-8.pdf>
- Hällsten, M. (2017). Is education a risky investment? The scarring effect of university dropout in Sweden. *European Sociological Review*, 33(2), 169–181. <https://doi.org/10.1093/esr/jcw053>
- Hamer, D., & Sirota, L. (2000). Beware the chopsticks gene. *Molecular Psychiatry*, 5(1), 11–13. <https://doi.org/10.1038/sj.mp.4000662>
- Hampole, M., Papanikolaou, D., Schmidt, L. D. W., & Seegmiller, B. (2025). *Artificial intelligence and the labor market* (NBER Working Paper No. 33509). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w33509>
- Hänggi, J., Bringolf-Isler, B., Kayer, B., Suggs, L.S., & Probst-Hensch, N. (2023). *SOPHYA-Studie: Resultate zum Bewegungsverhalten von Kindern und Jugendlichen in der Schweiz*. Swiss Tropical and Public Health Institute (Swiss TPH). https://www.baspo.admin.ch/dam/de/sd-web/2knOdL9ptPoP/sophya-studie-bewegungsverhalten-kind-er-jugendliche-schweiz_DE.pdf
- Hanks, A. S., Jiang, S., Qian, X., Wang, B., & Weinberg, B. A. (2024). *Do double majors face less risk? An analysis of human capital diversification* (NBER Working Paper No. 32095). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w32095>
- Hänni, M., Aeschlimann, B., & Kriesi, I. (2023). *Digitale Transformation an Höheren Fachschulen: Zwischen Innovation und Stagnation* (Trend im Fokus No. 11). Swiss Federal University for Vocational Education and Training (SFUVET). <https://www.ehb.swiss/sites/default/files/2023-08/Digitale%20Transformation%20an%20H%C3%B6heren-Fachschulen.pdf>

- [en%20Fachschulen%20-%20Zwischen%20Innovation%20und%20Stagnation.pdf](#)
- Hänni, M., & Kriesi, I. (2025). Unemployment scarring in the early career: Do skills and labour demand matter? *Social Inclusion*, 13. <https://doi.org/10.17645/si.9530>
- Hänni, M., Kriesi, I., & Neumann, J. (2022). Entry into and completion of vocational baccalaureate school in Switzerland: Do differences in regional admission regulations matter? *Education Sciences*, 12(3). <https://doi.org/10.3390/educsci12030188>
- Hansen, B., Matsuzawa, K., & Sabia, J. J. (2024). *In-person schooling and juvenile violence* (NBER Working Paper No. 33 317). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33317>
- Hanushek, E. A., Kinne, L., Lergetporer, P., & Woessmann, L. (2021). Patience, risk-taking, and human capital investment across countries. *The Economic Journal*, 132, 2290–2307. <https://doi.org/10.1093/ej/ueab105>
- Hanushek, E. A., Kinne, L., Sancassani, P., & Woessmann, L. (2023). *Can patience account for subnational differences in student achievement? Regional analysis with Facebook interests* (CESifo Working Paper No. 10 660). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.4583750>
- Hanushek, E. A., Kinne, L., Witthöft, F., & Woessmann, L. (2025). Age and cognitive skills: Use it or lose it. *Science Advances*, 11(10). <https://doi.org/10.1126/sciadv.adr1560>
- Hanushek, E. A., Piopiunik, M., & Wiederhold, S. (2019). The value of smarter teachers: International evidence on teacher cognitive skills and student performance. *Journal of Human Resources*, 54(4), 857–899. <https://doi.org/10.3368/jhr.54.4.0317.8619R1>
- Hanushek, E. A., Schwerdt, G., Woessmann, L., & Zhang, L. (2017). General education, vocational education, and labor-market outcomes over the lifecycle. *Journal of Human Resources*, 52(1), 48–87. <https://doi.org/10.3368/jhr.52.1.0415-7074R>
- Hartinger, K., Resnjanskij, S., Ruhose, J., & Wiederhold, S. (2021). *Individualism, human capital formation, and labor market success* (IZA Discussion Paper No. 14 820). Institute of Labor Economics (IZA). <https://www.jstor.org/stable/pdf/resrep63735.pdf?acceptTC=true&-coverage=false&addFooter=false>
- Heckman, J. J. (2006). Skill formation and the economics of investing in disadvantaged children. *Science*, 312(5782), 1900–1902. <https://doi.org/10.1126/science.1128898>
- Heckman, J. J., Galaty, B., & Tian, H. (2024). The economic approach to personality, character and virtue. In M. D. Matthews & R. D. Lerner (Eds.), *The Routledge international handbook of multidisciplinary perspectives on character development* (p. 55–103). Routledge. <https://doi.org/10.3386/w31258>
- Heckman, J. J., Lochner, L. J., & Todd, P. E. (2003). *Fifty years of Mincer earnings regressions* (NBER Working Paper No. 9732). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w9732>
- Heckman, J. J., Stixrud, J., & Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, 24(3), 411–482. <https://doi.org/10.1086/504455>
- Hedinger, A. (2024). *Menschenrechte in der politischen Bildung* [Dissertation, University of Zurich]. <https://doi.org/10.5167/uzh-258876>
- Heffetz, O., & Caspi, Y. (2025). *Measuring self-reported well-being* (NBER Working Paper No. 33 847). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33847>
- Heigle, J., & Pfeiffer, F. (2019). *An analysis of selected labor market outcomes of college dropouts in Germany: A machine learning estimation approach* [Research Report, ZEW Gutachten]. Leibniz-Zentrum für Europäische Wirtschaftsforschung (ZEW). <https://hdl.handle.net/10.419/222378>
- Heimann, A., Gut, R., & Kübler, D. (2023). *Die Jugend und die Citoyenneté der Zukunft. Studienbericht im Auftrag der Schweizerischen UNESCO-Kommission und der Schweizerischen Gemeinnützigen Gesellschaft* (No. 25). Zentrum für Demokratie. https://www.unesco.ch/wp-content/uploads/2023/08/Studienbericht_Zukunftsrat_ExecutiveSummary.pdf
- Hellerstein, J. K., Luo, S., & Urzúa, S. S. (2024). *Toward an understanding of the returns to cognitive skills across cohorts* (NBER Working Paper No. 32 229). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w32229>
- Herd, P., Freese, J., Sicinski, K., Domingue, B. W., Mullan Harris, K., Wei, C., & Hauser, R. M. (2019). Genes, gender inequality, and educational attainment. *American Sociological Review*, 84(6), 1069–1098. <https://doi.org/10.1177/0003122419886550>
- Herkenhoff, K., Lise, J., Menzio, G., & Phillips, G. M. (2024). Production and learning in teams. *Econometrica*, 92(2), 467–504. <https://doi.org/10.3982/ECTA16748>
- Hermes, H., Lergetporer, P., Mierisch, F., Peter, F., & Wiederhold, S. (2023). *Discrimination on the child care market: A nationwide field experiment* (IZA Discussion Paper No. 16 082). Institute of Labor Economics (IZA). <https://www.ssrn.com/abstract=4425132>
- Hermes, H., Lergetporer, P., Mierisch, F., Schwerdt, G., & Wiederhold, S. (2024). Information about inequality in early child care reduces polarization in policy preferences. *Journal of Economic Behavior & Organization*, 228. <https://doi.org/10.1016/j.jebo.2024.106780>
- Herzing, J., & Röhlke, L. (2024). *DigiPrim – Status quo der Digitalisierung auf der Primarstufe*. University of Bern, Interfaculty Centre for Educational Research (ICER). <https://doi.org/10.48350/193898>
- Herzog, S., Sandmeier, A., & Terhart, E. (2022). Berufliche Biografien und berufliche Mobilität von Lehrerinnen und Lehrern. In T. Hascher, T.-S. Idel, & W. Helsper (Eds.), *Handbuch Schulforschung* (p. 1251–1268). Springer VS. https://doi.org/10.1007/978-3-658-24729-4_60
- Hess, A.-K., Schubert, I., Samuel, R., & Burger, P. (2022). Changing routinized household energy consumption using the example of washing, cooking, and standby: A randomized controlled field experiment of home energy advice. *Cleaner and Responsible Consumption*, 4. <https://doi.org/10.1016/j.clrc.2022.100052>
- Hirsch, P. E., Holmeier, M., & Quesel, C. (2024). Flexibilisierung der Studienanforderungen in der Lehrerinnen- und Lehrerbildung – was sagen Studieninteressierte und Studierende? *BzL – Beiträge zur Lehrerinnen- und Lehrerbildung*, 42(2). <https://doi.org/10.36950/bzl.42.2.2024.10367>
- Hjalmarsson, R., Machin, S., & Pinotti, P. (2024). Chapter 9 – crime and the labor market. In C. Dustmann & T. Lemieux (Eds.), *Handbook of Labor Economics* (Vol. 5, p. 679–759). Elsevier. <https://doi.org/10.1016/bs.heslab.2024.11.008>
- Hoffmann, M., Boysel, S., Nagle, F., Peng, S., & Xu, K. (2024). *Generative AI and the nature of work* (CESifo Working Paper No. 11 479). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.5007084>
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations*. Sage Publications. https://digitalcommons.usu.edu/unf_research/53/
- Hofstede, G., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organizations: Software of the mind: Intercultural cooperation and its importance for survival*. McGraw-Hill. https://e-edu.nbu.bg/pluginfile.php/900222/mod_resource/content/1/G.Hofstede_G.J.Hofstede_M.Minkov%20-%20Cultures%20and%20Organizations%20-%20Software%20of%20the%20Mind%203rd%20edition%202010.pdf
- Holtmaat, E. A., & Alford-Hamburg, M. (2023). All Hands on deck: Solutions-based pedagogies for global environmental politics. *Global Environmental Politics*, 23(4), 17–25. <https://direct.mit.edu/glep/article-abstract/23/4/17/116264/All-Hands-on-Deck-Solutions-Based-Pedagogies-for?redirectedFrom=fulltext>
- Hong, L., & Lattanzio, S. (2025). The peer effect on future wages in the workplace. *Journal of Applied Econometrics*. <https://doi.org/10.1002/jae.3127>
- Howe, L. J., Rasheed, H., Jones, P. R., Boomsma, D. I., Evans, D. M., Giannelis, A., Hayward, C., Hopper, J. L., Hughes, A., Lahtinen, H., Li, S., Lind, P. A.,

- Martin, N. G., Martikainen, P., Medland, S. E., Morris, T. T., Nivard, M. G., Pingault, J.-B., Silventoinen, K., ... Davies, N. M. (2023). Educational attainment, health outcomes and mortality: A within-sibship Mendelian randomization study. *International Journal of Epidemiology*, 52(5), 1579–1591. <https://doi.org/10.1093/ije/dyado79>
- Hrizi, Y., & Dutrévis, M. (2022). *Violence au cycle d'orientation: Qu'en disent les actrices et acteurs? Tour d'horizon des situations qui chahutent l'école*. Service de la recherche en éducation (SRED). <https://www.ge.ch/document/29881/telecharger>
- Hubacher, M. S., Thyroff, J., Fahrni, L., & Dlabac, O. (2025). *PB-Tools*. Durchblick in der politischen Bildung. <https://pb-tools.ch/>
- Hui, X., Reshef, O., & Zhou, L. (2024). The short-term effects of generative artificial intelligence on employment: Evidence from an online labor market. *Organization Science*, 35(6), 1977–1989. <https://doi.org/10.1287/orsc.2023.18441>
- Hull, M., & Yan, J. (2024). The impact of children's access to public health insurance on their cognitive development and behavior. *Journal of Health Economics*, 98. <https://doi.org/10.1016/j.jhealeco.2024.102935>
- Hupka-Brunner, S., & Meyer, T. (2023). Gendered education and labor market trajectories in Switzerland. In J. Wyn, H. Cahill, & H. Cuervo (Eds.), *Handbook of Children and Youth Studies* (p. 1–14). Springer. https://doi.org/10.1007/978-981-4451-96-3_87-1
- Husmann, A., Wendt, H., Bos, W., Bremerich-Vos, A., Kasper, D., Lankes, E.-M., McElvany, N., Stubbe, T. C., & Valtin, R. (Eds.). (2017). *IGLU 2016: Lesekompetenzen von Grundschulkindern in Deutschland im internationalen Vergleich*. Waxmann. https://www.pedocs.de/volltexte/2018/15476/pdf/Husmann_et_al_2017_IGLU_2016.pdf
- Huttunen, K., Pekkarinen, T., Uusitalo, R., & Virtanen, H. (2023). Lost boys? Secondary education and crime. *Journal of Public Economics*, 218. <https://doi.org/10.1016/j.jpubeco.2022.104804>
- IBE [Institut für Bildungsevaluation]. (2023). *Check P3 2023: Ergebnisbericht für den Bildungsraum Nordwestschweiz*. IBE. https://www.bildungsraum-nw.ch/schwerpunkte/volksschule/ergebnisberichte_checks/copy3_of_ergebnisbericht2020/kantonsbericht-check-p3-2023.pdf/@download/file/Kantonsbericht%20CHeck%20P3%202023.pdf?inline=true
- Ibsen, K., & Rosholm, M. (2024). *What works? Interventions aimed at reducing student dropout in higher education* (IZA Discussion Paper No. 16853). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4759865>
- Ilter, I. (2023). Which types of amotivation affect school absenteeism and academic performance of middle school students? A structural equation modeling analysis. *RMLE Online: Research in Middle Level Education*, 46(2). <https://doi.org/10.1080/19404476.2022.2161785>
- ilz [Interkantonale Lehrmittelzentrale]. (2023). *Sprachregionale Lehrmittelkoordination: Bericht 2023*. ilz. https://www.ilz.ch/sites/default/files/inline-files/bericht-sprachregionale-lehrmittelkoordination_2023-06-22.pdf
- Imlig et al. (2019). *Situation des Kindergartens im Kanton Zürich*. Bildungsdirektion Kanton Zürich: Bildungsplanung. https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/bildung/bildungssystem/studien/monitoringbericht_kindergarten_2019.pdf
- Izadi, R., & Tuhkuri, J. (2024). Evolving returns to personality. *Journal of Labor Economics*. <https://doi.org/10.1086/733226>
- Jarosch, G., Oberfeld, E., & Rossi-Hansberg, E. (2021). Learning from coworkers. *Econometrica*, 89(2), 647–676. <https://doi.org/10.3982/ECTA16915>
- Jedwab, R., Romer, P., Islam, A. M., & Samaniego, R. (2023). Human capital accumulation at work: Estimates for the world and implications for development. *American Economic Journal: Macroeconomics*, 15(3), 191–223. <https://doi.org/10.1257/mac.2021002>
- Jensen, P., & Rasmussen, A. W. (2011). The effect of immigrant concentration in schools on native and immigrant children's reading and math skills. *Economics of Education Review*, 30(6), 1503–1515. <https://doi.org/10.1016/j.econedurev.2011.08.002>
- Jeroense, T., & Spierings, N. (2023). Political participation profiles. *West European Politics*, 46(1), 1–23. <https://doi.org/10.1080/01402382.2021.2017612>
- Jessen, J., Schmitz, S., & Waights, S. (2020). Understanding day care enrolment gaps. *Journal of Public Economics*, 190. <https://doi.org/10.1016/j.jpubeco.2020.104252>
- Jones, T., & Karger, E. (2023). *School and crime* (IZA Discussion Paper No. 16506). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=4597723>
- Josten, C., Krause, H., Lordan, G., & Yeung, B. (2024). *What skills pay more? The changing demand and return to skills for professional workers* (IZA Discussion Paper No. 16755). Institute of Labor Economics (IZA). <https://hdl.handle.net/10419/295778>
- Kaderli, T., Heusser, C., Sager, P., & Bischof, S. (2025). *Wirkungsevaluation der subjektorientierten Finanzierung in der höheren Berufsbildung*. Büro BASS. https://www.sbf.admin.ch/dam/de/sd-web/gfXnAHAVj5FL/BASS_Wirkungsevaluation_SuFi_Schlussbericht_DE.pdf
- Kahne, J., & Bowyer, B. (2019). Can media literacy education increase digital engagement in politics? *Learning, Media and Technology*, 44(2), 211–224. <https://doi.org/10.1080/17439884.2019.1601108>
- Kamm, C., Gomensoro, A., Heers, M., & Hupka-Brunner, S. (2023a). Aspiring high in the Swiss VET-dominated education system: Second generation young adults and their immigrant parents. *Journal of Vocational Education & Training*, 75(1), 155–174. <https://doi.org/10.1080/13636820.2022.2139746>
- Kamm, C., Gomensoro, A., Heers, M., & Hupka-Brunner, S. (2023b). Parental investment in children's educational pathways: A comparative view on Swiss and migrant families. *Swiss Journal of Sociology*, 49(2), 367–394. <https://doi.org/10.2478/sjs-2023-0019>
- Kanton Bern. (2019). *Integration und besondere Massnahmen in der Volksschule des Kantons Bern (IBEM)*. Erziehungsdirektion des Kantons Bern: Amt für Kindergarten, Volksschule und Beratung. <https://sb4efb903246ac4a.jimcontent.com/download/version/1743073057/module/13563960092/name/Leitfaden%20IBEM%202019.pdf>
- Kanton Bern. (2023). *Geflüchtete Kinder und Jugendliche in der Volksschule: Information für Schulen und Gemeinden*. Bildungs- und Kulturdirektion des Kantons Bern: Amt für Kindergarten, Volksschule und Beratung. https://www.akvb-unterricht.bkd.be.ch/content/dam/akvb-unterricht_bkd/dokumente/de/startseite/migration/fluechtlingskinder-in-der-volksschule/leitfaden-gefluechtete-kind-er-in-der-volksschule-d.pdf
- Kanton Luzern. (2021). *Implementierung Lehrplan 21: Evaluation der Kompetenzorientierung, Beurteilung und Lehrmittel: Bericht 2021 für den 1. und 2. Zyklus*. Dienststelle Volksschulbildung. https://edudoc.ch/nanna/record/222800/files/LU_eval_bericht_implementierung_lp21_zykl_1_und_2.pdf?withWatermark=o&withMetadata=o&register-Download=1&version=1
- Kanton Waadt. (2022). *Cadre général de l'évaluation*. Direction générale de l'enseignement obligatoire et de la pédagogie spécialisée. https://www.vd.ch/fileadmin/user_upload/organisation/dfi/dgeo/fichiers_pdf/CGE/CGE.pdf
- Kanton Zürich. (2021). *Unterrichten an Aufnahmeklassen Asyl*. Bildungsdirektion: Volksschulamt. https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/bildung/informationen-fuer-schulen/informationen-fuer-die-volksschule/schule-migration/beschulung-von-fluechtlingskindern/unterrichten_ak_asyl.pdf
- Kanton Zürich. (2024). *Familienergänzende Betreuung im Frühbereich: Monitoringbericht 2022*. Bildungsdirektion Kanton Zürich: Bildungsplanung. <https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/bildung/bildungssystem/zahlen/berichte/familienerganzende-betreuung-fruehbereich-2022.pdf>
- Kappler, C. (2022). Gleiche Bildungsangebote, unterschiedliche Auswahlkriterien – zur Bedeutung von Geschlecht bei der Berufswahl

- „Lehrer*in“. In S. Burren & S. Larcher (Eds.), *Geschlecht, Bildung, Profession: Ungleichheiten Im Pädagogischen Berufsfeld* (p. 173–189). Verlag Barbara Budrich. <https://doi.org/10.2307/j.ctv23r3g8d.11>
- Kara, E., Tonin, M., & Vlassopoulos, M. (2021). Class size effects in higher education: Differences across STEM and non-STEM fields. *Economics of Education Review*, 82. <https://doi.org/10.1016/j.econedurev.2021.102104>
- Karlen, Y., Bühlmann, F., Campagnoni, M., Pfaffhauser, R., Schuler, N., & Zimmerli, C. (2022). *Überfachliche Kompetenzen stärken. Anregungen für die Planung, Förderung und Einschätzung überfachlicher Kompetenzen*. Pädagogische Hochschule FHNW. <https://doi.org/10.26.041/fhnw-4854>
- Kassis, M. A., Neuenschwander, M., & Baumgartner, D. (2022). Coaching für Chancengerechtigkeit. *Schweizerische Zeitschrift für Heilpädagogik*, 28(4). <https://ojs.szh.ch/zeitschrift/article/view/1004>
- Kawano, L., Sacerdote, B., Skimmyhorn, W. L., & Stevens, M. (2024). *On the determinants of young adult outcomes: Impacts of randomly assigned neighborhoods for children in military families* (NBER Working Paper No. 32 674). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w32674>
- Keller-Schneider, M. (2023). Berufseinstieg in der Schweiz: Herausforderungen und institutionelle Angebote. *Erziehung und Unterricht*, 7–8, 596–604. https://www.researchgate.net/profile/Manuela-Keller-Schneider/publication/377781959_Berufseinstieg_in_der_Schweiz_Herausforderungen_und_institutionelle_Angebote_Zeitschrift_Erziehung_und_Unterricht/links/65dad28a01325d46521973f/Berufseinstieg-in-der-Schweiz-Herausforderungen-und-institutionelle-Angebote-Zeitschrift-Erziehung-und-Unterricht.pdf
- Kendler, K. S., Ohlsson, H., Sundquist, J., & Sundquist, K. (2023). The moderation of the genetic risk for alcohol and drug use disorders in a Swedish national sample by the genetic aptitude for educational attainment. *Psychological Medicine*, 53(7), 1112–1121. <https://doi.org/10.1017/S0033291721005134>
- Kiener, F., Eggenberger, C., & Backes-Gellner, U. (2024). The role of occupational skill sets in the digital transformation: How IT progress shapes returns to specialization and social skills. *Journal of Business Economics*, 94(1), 75–111. <https://doi.org/10.1007/s11573-023-01153-9>
- Kiener, F., Gnehm, A.-S., & Backes-Gellner, U. (2023). Noncognitive skills in training curricula and nonlinear wage returns. *International Journal of Manpower*, 44(4), 772–788. <https://doi.org/10.1108/IJM-03-2022-0119>
- Kiess, J. (2022). Learning by doing: The impact of experiencing democracy in education on political trust and participation. *Politics*, 42(1), 75–94. <https://doi.org/10.1177/0263395721990287>
- Kitzman, H., Olds, D. L., Knudtson, M. D., Cole, R., Anson, E., Smith, J. A., Fishbein, D., DiClemente, R., Wingood, G., Caliendo, A. M., Hopfer, C., Miller, T., & Conti, G. (2019). Prenatal and infancy nurse home visiting and 18-year outcomes of a randomized trial. *Pediatrics*, 144(6). <https://doi.org/10.1542/peds.2018-3876>
- Knowles, R. T., Camicia, S., & Nelson, L. (2023). Education for democracy in the social media century. *Research in Social Sciences and Technology*, 8(2). <https://doi.org/10.46303/ressat.2023.9>
- Koenings, F., Di Meo, G., & Uebelmesser, S. (2020). University rankings as information source: Do they play a different role for domestic and international students? *Applied Economics*, 52(59), 6432–6447. <https://doi.org/10.1080/00036846.2020.1795075>
- Komitee für eine Schule mit Zukunft. (2024). *Wieso Förderklassen?* Retrieved 18 November 2024, from <https://www.schule-mit-zukunft.ch/de-ch/argumente/>
- König, J., & Rothland, M. (2012). Motivations for choosing teaching as a career: Effects on general pedagogical knowledge during initial teacher education. *Asia-Pacific Journal of Teacher Education*, 40(3), 289–315. <https://doi.org/10.1080/1359866X.2012.700045>
- Konsortium ÜGK. (2019a). *Überprüfung der Grundkompetenzen: Nationaler Bericht der ÜGK 2016: Mathematik 11. Schuljahr*. Swiss Conference of Cantonal Ministers of Education (EDK) & Service de la recherche en éducation (SRED). <https://doi.org/10.18747/PHSG-coll3/id/386>
- Konsortium ÜGK. (2019b). *Überprüfung der Grundkompetenzen: Nationaler Bericht der ÜGK 2017: Sprachen 8. Schuljahr*. Swiss Conference of Cantonal Ministers of Education (EDK) & Service de la recherche en éducation (SRED). <https://doi.org/10.18747/PHSG-coll3/id/385>
- Košinár, J., & Laros, A. (2022). The genesis of the teacher habitus – a longitudinal study with Swiss primary teacher students. *Zeitschrift für Bildungsforschung*, 12, 255–274. <https://doi.org/10.1007/s35834-022-00350-w>
- Kosse, F., Leffler, T., & Woemmel, A. (2024). *Digital skills: Social disparities and the impact of early mentoring* (CESifo Working Paper No. 11 570). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.5073384>
- Kraft, M. A., Marinell, W. H., & Yee, D. S.-W. (2016). School organizational contexts, teacher turnover, and student achievement: Evidence from panel data. *American Educational Research Journal*, 53(5), 1411–1449. <https://doi.org/10.3102/0002831216667478>
- Krammer, G., & Pflanzl, B. (2019). Können wir jede Person lehren? Lehrer*in zu werden? Sollen wir es? In *Journal für LehrerInnenbildung* 19(2), 28–39. https://doi.org/10.35468/jlb-02-2019_02
- Kreis, A., & Güdel, T. (2023). *Schulische und ausserschulische Erwerbstätigkeit der Studierenden im Studiengang SEK I. Bericht zur Kurzbefragung aller Studierenden der Studienprogramme SEK I an der PHLU im Herbstsemester 2022*. Pädagogische Hochschule Luzern. <https://doi.org/10.13140/RG.2.2.27528.29443>
- Kriesi, I., Bonoli, L., Grønning, M., Hänni, M., Neumann, J., & Schweri, J. (2022). *Spannungsfelder in der Berufsbildung international und in der Schweiz – Entwicklungen, Herausforderungen, Potenziale* (Trendbericht No. 5). Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/2022-11/Trendbericht_2022_DE.pdf
- Kriesi, I., & Sander, F. (2024). Academic or vocational education? A comparison of the long-term wage development of academic and vocational tertiary degree holders. *Journal for Labour Market Research*, 58. <https://doi.org/10.1186/s12651-024-00368-9>
- Kronenberg, B. (2021). *Sonderpädagogik in der Schweiz*. Staatssekretariat für Bildung, Forschung und Innovation (SERI) & Swiss Conference of Cantonal Ministers of Education (EDK). https://edudoc.ch/nanna/record/221116/files/Sonderpaedagogik_Schweiz.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Kroth, A. (2015). *The effects of the introduction of tuition on college enrollment in Germany: Results from a natural experiment with special reference to students from low parental education backgrounds* [Dissertation, University of Michigan]. <https://hdl.handle.net/2027.42/111597>
- Kuhn, A. (2022). *The geography of occupational choice: Empirical evidence from the Swiss apprenticeship market* (IZA Discussion Paper No. 15 679). Institute of Labor Economics (IZA). <https://www.ssrn.com/abstract=4268787>
- Kuhn, A., & Schweri, J. (2023). Arbeitsmarkterfolg mit beruflichen und allgemeinbildenden Abschlüssen im Vergleich. BWP, 52(1), 17–21. <https://www.bwp-zeitschrift.de/dienst/publikationen/de/18283>
- Kuhn, A., & Wolter, S. C. (2023). The strength of gender norms and gender-stereotypical occupational aspirations among adolescents. *Kyklos*, 76(1), 101–124. <https://doi.org/10.1111/kykl.12320>
- Külling-Knecht, C., Waller, G., Suter, L., Willemse, I., Bernath, J., Streule, P., Süss, D., Deda-Bröchin, S., Settegrana, N., & Jochim, M. (2024). *JAMES – Jugend, Aktivitäten, Medien – Erhebung Schweiz*. Zürcher Hochschule für Angewandte Wissenschaften (ZHAW). https://www.zhaw.ch/storage/psychologie/upload/forschung/medienpsychologie/james/2018/JAMES_2024_DE.pdf
- Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: Effects on instructional

- quality and student development. *Journal of Educational Psychology*, 105(3), 805–820. <https://doi.org/10.1037/a0032583>
- Kuratle, R. (2024). *Die Implementation des Lehrplans 21 in den Kantonen Bern, Luzern und Zürich* [Dissertation, University of Zurich]. <https://doi.org/10.5167/uzh-265597>
- Lanfranchi, A. (2002). *Schulerfolg von Migrationskindern: Die Bedeutung familienergänzender Betreuung im Vorschulalter*. Springer Fachmedien. <https://doi.org/10.1007/978-3-322-97562-1>
- Lanfranchi, A. (2007). Ein gutes Betreuungsangebot ist der halbe Schulerfolg. In C. Bollier & M. Sigrist (Eds.), *Auf dem Weg zu einer integrativen Basisstufe* (p. 73–88). Edition SZH.
- Lanfranchi, A., & Steinegger, B. (2023). Kinder vor Vernachlässigung schützen: Frühe Förderung für vulnerable Familien mit «PAT – Mit Eltern lernen». *Schweizerische Zeitschrift für Heilpädagogik*, 29(03). <https://doi.org/10.57161/z2023-03-03>
- Langer, C., & Wiederhold, S. (2023). *The value of early-career skills* (CESifo Working Paper No. 10 288). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.4369987>
- Lanners, R. (2024). Integration vor Separation im Spiegel unserer Statistik. *Schweizerische Zeitschrift für Heilpädagogik*, 30(09). <https://doi.org/10.57161/z2024-09-01>
- Larsen, M. R., Sommersel, H. B., & Larsen, M. S. (2013). *Evidence on dropout phenomena at universities*. Danish Clearinghouse for Educational Research. https://dpu.au.dk/fileadmin/edu/Udgivelser/Clearing-house/Review/Evidence_on_dropout_from_universities_brief_version.pdf
- Lavecchia, A., Oreopoulos, P., & Spencer, N. (2025). *The impact of comprehensive student support on crime: Evidence from the pathways to education program* (CESifo Working Paper No. 11 676). Center for Economic Studies (CESifo). https://www.ifo.de/DocDL/cesifo1_wp11676.pdf
- Lavy, V., & Megalokonomou, R. (2019). *Persistency in teachers' grading bias and effects on longer-term outcomes: University admissions exams and choice of field of study* (NBER Working Paper No. 26 021). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w26021>
- Lavy, V., & Sand, E. (2018). On the origins of gender gaps in human capital: Short- and long-term consequences of teachers' biases. *Journal of Public Economics*, 167, 263–279. <https://doi.org/10.1016/j.jpubeco.2018.09.007>
- LCH [Dachverband Lehrerinnen und Lehrer Schweiz]. (2024). *Politische Bildung in der Schule stärken – das Fundament für eine starke Demokratie legen*. https://www.lch.ch/fileadmin/user_upload/LCH/Politik/Positionspapiere/240524_Positionspapier_PolitischeBildung_Langversion_publiziert.pdf
- Lee, J. J., Wedow, R., Okbay, A., Kong, E., Maghzian, O., Zacher, M., Nguyen-Viet, T. A., Bowers, P., Sidorenko, J., Karlsson Linnér, R., Fontana, M. A., Kundu, T., Lee, C., Li, H., Li, R., Royer, R., Timshel, P. N., Walters, R. K., Willoughby, E. A., ... Cesarini, D. (2018). Gene discovery and polygenic prediction from a genome-wide association study of educational attainment in 1.1 million individuals. *Nature Genetics*, 50(8), 1112–1121. <https://doi.org/10.1038/s41588-018-0147-3>
- Lee, Y. S., Iizuka, T., & Eggleston, K. (2025). Robots and labor in nursing homes. *Labour Economics*, 92. <https://doi.org/10.1016/j.labeco.2024.102666>
- Leemann, R. J., Imdorf, C., Fischer, A., Esposito, R. S., & Hafner, S. (2019). Die Fachmittelschule als 'Mädchenschule'? Eine Bildungsinstitution der Sekundarstufe II zwischen Reproduktion und Transformation der geschlechtertypischen Berufswahl. In E. Makarova (Eds.), *Gendersensible Berufsorientierung und Berufswahl: Beiträge aus Forschung und Praxis* (p. 48–67). hep Verlag. <https://doi.org/10.26041/fhnw-1793>
- Leemann, R. J., Pfeifer Brändli, A., Imdorf, C., & Hafner, S. (2022). Lehramtsstudierende in der Schweiz: Zur Bedeutung der Zugangswege Gymnasium, Fachmittelschule und berufliche Grundbildung in Geschlechterperspektive. In S. Burren & S. Larcher (Eds.), *Geschlecht, Bildung, Profession: Ungleichheiten im pädagogischen Berufsfeld* (p. 190–217). Verlag Barbara Budrich. <https://doi.org/10.3224/84742421.10>
- Lehnert, P., Dell, M., Backes-Gellner, U., & Bettinger, E. (2024). *The effect of postsecondary educational institutions on local economies: A bird's-eye view* (NBER Working Paper No. 32 679). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w32679>
- Lehnert, P., & Pfeifer, H. (2024). *Environmental awareness and occupational choices of adolescents* (Economics of Education Working Paper Series No. 231). Swiss Leading House VPET-ECON. http://repec.business.uzh.ch/RePEc/iso/leadinghouse/0231_lhwpaper.pdf
- Lemieux, T. (2006). The «Mincer Equation» thirty years after schooling, experience, and earnings. In S. Grossbard (Eds.), *Jacob Mincer: A pioneer of modern labor economics* (p. 127–145). Springer. https://doi.org/10.1007/0-387-29175-X_11
- Lenard, M. A., & Silliman, M. (2025). Informal social interactions, academic achievement and behavior: Evidence from peers on the school bus. *The Economic Journal*. <https://doi.org/10.1093/ej/ueaf013>
- Lepori, B., & Jongbloed, B. (2018). Chapter 12: National resource allocation decisions in higher education: Objectives and dilemmas. In B. Cantwell, H. Coates, & R. King (Eds.), *Handbook on the Politics of Higher Education* (p. 211–228). <https://doi.org/10.4337/9781786435026.00021>
- Lepori, B., Seeber, M., & Bonaccorsi, A. (2015). Competition for talent. Country and organizational-level effects in the internationalization of European higher education institutions. *Research Policy*, 44(3), 789–802. <https://doi.org/10.1016/j.respol.2014.11.004>
- Leuven, E., & Lokken, S. A. (2017). *Long term impacts of class size in compulsory school* (IZA Discussion Paper No. 10 594). Institute of Labor Economics (IZA). <https://docs.iza.org/dp10594.pdf>
- Lievore, I., Fedeli, E., & Triventi, M. (2024). The stricter the better? The impact of early teacher grading standards on students' competences development and academic track enrollment. *Social Science Research*, 124. <https://doi.org/10.1016/j.ssresearch.2024.103085>
- Lindström, E., & Lindahl, E. (2011). The effect of mixed-age classes in Sweden. *Scandinavian Journal of Educational Research*, 55(2), 121–144. <https://doi.org/10.1080/00313831.2011.554692>
- List, J. A., Momeni, F., Vlassopoulos, M., & Zenou, Y. (2023). *Neighborhood spillover effects of early childhood interventions* (CEPR Discussion Papers No. 18 134). CEPR Press. <https://cepr.org/publications/dp18134>
- Liu, J., Lee, M., & Gershenson, S. (2021). The short- and long-run impacts of secondary school absences. *Journal of Public Economics*, 199. <https://doi.org/10.1016/j.jpubeco.2021.104441>
- Liu, Q., & Nesbit, J. C. (2024). The relation between need for cognition and academic achievement: A meta-analysis. *Review of Educational Research*, 94(2), 155–192. <https://doi.org/10.3102/00346543231160474>
- Liu, S., & Netzer, N. (2023). Happy times: Measuring happiness using response times. *American Economic Review*, 113(12), 3289–3322. <https://www.aeaweb.org/articles?id=10.1257/aer.2021.051>
- Lleras-Muney, A. (2022). Education and income gradients in longevity: The role of policy. *Canadian Journal of Economics/Revue Canadienne d'économie*, 55(1), 5–37. <https://doi.org/10.1111/caje.12582>
- Lobsiger, M., & Rützer, C. (2021). The green potential of occupations in Switzerland. *Swiss Journal of Economics and Statistics*, 157. <https://doi.org/10.1186/s41937-021-00076-y>
- Lochner, L., Park, Y., & Shin, Y. (2025). *The evolution of unobserved skill returns in the U.S.: A new approach using panel data* (NBER Working Paper No. 33 407). National Bureau of Economic Research (NBER). <https://www.nber.org/papers/w33407>
- Lopez, L. M. (2024). Construire des cultures en faveur d'évaluations positives pour l'avenir: Enjeux de la collaboration autour de la production de textes à visée instituante. *La Revue LEE*, 8. <https://doi.org/10.48325/rlee.008.02>

- Lüssi, P. (2024). *Überblick zur Situation der familien- und schulergänzenden Kinderbetreuung in den Kantonen*. University of Bern. <https://ch-sodk.s3.eu-west-1.amazonaws.com/media/files/e8a44418/fbdd/4d43/a240/7106c458bfed/Ueberblick-zur-Situation-der-familien-und-schul-ergaen.pdf>
- Lüthi, S. (2025). Classroom versus workbench: The impact of firm-based learning on labour market and educational outcomes. *Economics of Education Review*, 109. <https://doi.org/10.1016/j.econedurev.2025.102719>
- Lüthi, S., & Wolter, S. C. (2020). Are apprenticeships business cycle proof? *Swiss Journal of Economics and Statistics*, 156. <https://doi.org/10.1186/s41937-019-0047-1>
- Lüthi, S., & Zumbühl, M. (2024). The response of public education spending to changes in student cohort sizes. *Education Economics*, 1–14. <https://doi.org/10.1080/09645292.2024.2421980>
- Lütje-Klose, B., Neumann, P., Gorges, J., & Wild, E. (2018). Die Bielefelder Längsschnittstudie zum Lernen in inklusiven und exklusiven Förderarrangements (BiLieF) – zentrale Befunde. *DDS – Die Deutsche Schule*, 110(2), 109–123. https://www.researchgate.net/publication/334076034_Die_Bielefelder_Langsschnittstudie_zum_Lernen_in_inklusive_und_exklusiven_Foerderarrangements_BiLieF_-_Zentrale_Befunde
- Lybeck, R., Koiranen, I., & Koivula, A. (2024). From digital divide to digital capital: The role of education and digital skills in social media participation. *Universal Access in the Information Society*, 23, 1657–1669. <https://doi.org/10.1007/s10209-022-00961-0>
- Machin, S., & Sandi, M. (2025). Crime and education. *Annual Review of Economics*, 17. <https://doi.org/10.1146/annurev-economics-090324-035606>
- Mader, S., Costantini, D., Fahr, A., & Delgrande Jordan, M. (2025). The effect of social media use on adolescents' subjective well-being: Longitudinal evidence from Switzerland. *Social Science & Medicine*, 365, 1–11. <https://doi.org/10.1016/j.socscimed.2024.117595>
- Maleq, K. (2023). *Co-construire un partenariat avec les familles en contexte d'interculturalité: Quelles collaborations entre parents et professionnelles dans les institutions de la petite enfance genevoises?* [Dissertation, Université de Genève]. <https://doi.org/10.13097/archive-ouverte/unige:167550>
- Mannoni, E. (2025). "I'm worried, but": Unpacking the gap between environmental concern and pro-environmental behavior. *Swiss Political Science Review*. <https://doi.org/10.1111/spsr.12660>
- Marie, O., & Zölitz, U. (2017). "High" achievers? Cannabis access and academic performance. *The Review of Economic Studies*, 84(3), 1210–1237. <https://doi.org/10.1093/restud/rdx020>
- Martini, A., Azzolini, D., Romano, B., & Vergolini, L. (2021). Increasing college going by incentivizing savings: Evidence from a randomized controlled trial in Italy. *Journal of Policy Analysis and Management*, 40(3), 814–840. <https://doi.org/10.1002/pam.22260>
- Masuda, K., & Shigeoka, H. (2023). *Education and later-life mortality: Evidence from a school reform in Japan* (NBER Working Paper No. w31472). National Bureau of Economic Research (NBER). <https://papers.ssrn.com/abstract=4512506>
- Matković, T., & Kogan, I. (2012). All or nothing? The consequences of tertiary education non-completion in Croatia and Serbia. *European Sociological Review*, 28(6), 755–770. <https://doi.org/10.1093/esr/jcr111>
- Matthes, K. L., Le Vu, M., & Staub, K. (2025). Fertility dynamics through historical pandemics and Covid-19 in Switzerland, 1871–2022. *Population Studies*, 1–16. <https://doi.org/10.1080/00324728.2025.2462291>
- Matthewes, S. H. (2021). Better together? Heterogeneous effects of tracking on student achievement. *The Economic Journal*, 131(635), 1269–1307. <https://doi.org/10.1093/ej/ueaa106>
- Matthewes, T., Qualter, P., Bryan, B. T., Caspi, A., Danese, A., Moffitt, T. E., Odgers, C. L., Strange, L., & Arseneault, L. (2023). The developmental course of loneliness in adolescence: Implications for mental health, educational attainment, and psychosocial functioning. *Development and Psychopathology*, 35(2), 537–546. <https://doi.org/10.1017/S0954579421001632>
- McCombie, G., & Guldemann, T. (2022). Berufspraktische Ausbildung an Partnerschulen: Führen mehr Kooperation und mehr Kontinuität zu einer höheren Professionalisierung? *Beiträge zur Lehrerinnen- und Lehrerbildung*, 40(1), 111–127. <https://doi.org/10.25656/0124549>
- McDonald, P., & Korber, M. (2023). Employer preferences for vocational over general education: Evidence from an employer survey experiment. *Research in Social Stratification and Mobility*, 83. <https://doi.org/10.1016/j.rssm.2022.100756>
- Medici, G., Tschopp, C., Grote, G., & Hirschi, A. (2020). Grass roots of occupational change: Understanding mobility in vocational careers. *Journal of Vocational Behavior*, 122. <https://doi.org/10.1016/j.jvb.2020.103480>
- Meier, A., Squindo, M., & Hofmann, C. (2024). *Schlussbericht: Studie zur Angebotssituation der Begabungs- und Begabtenförderung in der Deutschschweiz und dem Fürstentum Liechtenstein*. Interkantonale Hochschule für Heilpädagogik (HfH). https://www.hfh.ch/sites/default/files/documents/schlussbericht_bbf.pdf?srsltid=AfmBOorfz4YtjQog-fH5UomS8mErqE8PBf6GxcTgLOmbMoqStwMgI7
- Meier, C., Vilpert, S., Borrat-Besson, C., Jox, R. J., & Maurer, J. (2022). Health literacy among older adults in Switzerland: Cross-sectional evidence from a nationally representative population-based observational study. *Swiss Medical Weekly*, 152(1314). <https://doi.org/10.4414/smww.2022.w30158>
- Melhuish, E., Ereky-Stevens, K., Petrogiannis, K., Ariescu, A., Penderi, E., Rentzou, K., Tawell, A., Leseman, P., & Broekhuisen, M. (2015). *A review of research on the effects of early childhood education and care (ECEC) on child development*. European Commission. https://ecec-care.org/fileadmin/careproject/Publications/reports/CARE_WP4_D4_1_review_of_effects_of_ecec.pdf
- Merz, E. C., Strack, J., Hurtado, H., Vainik, U., Thomas, M., Evans, A., & Khundrakpam, B. (2022). Educational attainment polygenic scores, socioeconomic factors, and cortical structure in children and adolescents. *Human Brain Mapping*, 43(16), 4886–4900. <https://doi.org/10.1002/hbm.26034>
- Mikkonen, J., Remes, H., Moustgaard, H., & Martikainen, P. (2020). Evaluating the role of parental education and adolescent health problems in educational attainment. *Demography*, 57(6), 2245–2267. <https://doi.org/10.1007/s13524-020-00919-y>
- Miller, A. (2013). Principal turnover and student achievement. *Economics of Education Review*, 36, 60–72. <https://doi.org/10.1016/j.econedurev.2013.05.004>
- Mincer, J. A. (1974). *Schooling, experience, and earnings*. National Bureau of Economic Research Conference Report. <https://www.nber.org/books-and-chapters/schooling-experience-and-earnings>
- Minkov, M., & Hofstede, G. (2012). Hofstede's fifth dimension: New evidence from the world values survey. *Journal of Cross-Cultural Psychology*, 43(1), 3–14. <https://doi.org/10.1177/0022022110388567>
- Mishra, S., Klein, D., & Müller, L. (2023). Does the higher education experience affect political interest, efficacy, and participation? Comparing dropouts to graduates and 'non-starters'. *European Journal of Higher Education*, 15(1), 89–106. <https://doi.org/10.1080/21568235.2023.2276853>
- Miyamoto, A., Werner, K., & Schmidt, F. T. C. (2024). A reciprocal perspective on the differential associations between personality traits and multiple indicators of academic achievement. *Journal of Personality*, 92(4), 1067–1085. <https://doi.org/10.1111/jopy.12871>
- Molnár, G., & Kocsis, Á. (2024). Cognitive and non-cognitive predictors of academic success in higher education: A large-scale longitudinal study. *Studies in Higher Education*, 49(9), 1610–1624. <https://doi.org/10.1080/03075079.2023.2271513>

- Moraal, D., & Schönfeld, G. (2012). Berufliche Aus- und Weiterbildung in Unternehmen. *WSI-Mitteilungen*, 65(5), 329–337. <https://doi.org/10.5771/0342-300X-2012-5-329>
- Morinaj, J., & Hascher, T. (2022). On the relationship between student well-being and academic achievement: A longitudinal study among secondary school students in Switzerland. *Zeitschrift für Psychologie*, 230(3), 201–214. <https://doi.org/10.1027/2151-2604/a000499>
- Morlet, G. M. A., & Bolli, T. (2025). The moderating effect of firm-specificity on the impact of unemployment on the demand for apprentices: Evidence from Switzerland during Covid-19. *LABOUR*, 1–22. <https://doi.org/10.1111/labr.70000>
- Moschion, J., & van Ours, J. (2025). Lifting up the lives of extremely disadvantaged youth: The role of staying in school longer. *Journal of Economic Behavior & Organization*, 238. <https://doi.org/10.1016/j.jebo.2025.107205>
- Moser, U., Buff, A., Angelone, D., & Hollenweger, J. (2011). *Nach sechs Jahren Primarschule. Deutsch, Mathematik und motivational-emotionales Befinden am Ende der 6. Klasse*. Bildungsdirektion Kanton Zürich. https://www.ibe.uzh.ch/dam/jcr:00000000-6ff9-ac1b-ffff-94c8e8ec/Lernstandserhebung_6KlasseZH_Bericht.pdf
- Movetia (2023). *Taux de mobilité et index d'internationalisation des hautes écoles suisses*. Movetia. https://movetia.ch/files/04_Magazin/2023/01_Januar/Movetia_Rapport_Internationalisation_Index_FR.pdf
- Muehleemann, S. (2024). *AI adoption and workplace training* (IZA Discussion Paper No. 17367). Institute of Labor Economics (IZA). <https://hdl.handle.net/10419/307191>
- Mühleck, K., & Hadjar, A. (2023). Higher education and active citizenship in five European countries: How institutions, fields of study and types of degree shape the political participation of graduates. *Research in Comparative and International Education*, 18(1), 32–54. <https://doi.org/10.1177/17454999231157160>
- Müller, R., Keller, A., Kerle, U., Raggl, A., & Steiner, E. (Eds.). (2011). *Schule im alpinen Raum* (Vol. 2). StudienVerlag. <https://www.studienverlag.at/produkt/5103/schule-im-alpinen-raum/>
- Mullis, I. V. S., Martin, M. O., & Loveless, T. (2016). *20 years of TIMSS: International trends in mathematics and science achievement, curriculum, and instruction*. International Association for the Evaluation of Educational Achievement (IEA). <https://timssandpirls.bc.edu/timss2015/international-results/timss2015/wp-content/uploads/2016/T15-20-years-of-TIMSS.pdf>
- Muntoni, F., & Retelsdorf, J. (2018). Gender-specific teacher expectations in reading – the role of teachers' gender stereotypes. *Contemporary Educational Psychology*, 54, 212–220. <https://doi.org/10.1016/j.cedpsych.2018.06.012>
- Nagler, M., Piopiunik, M., & West, M. R. (2020). Weak markets, strong teachers: Recession at career start and teacher effectiveness. *Journal of Labor Economics*, 38(2), 453–500. <https://doi.org/10.1086/705883>
- NaYoung Hwang, & Fitzpatrick, B. (2021). Student-teacher gender matching and academic achievement. *AERA Open*, 7. <https://doi.org/10.1177/23328584211040058>
- Nef, S., Frigo Charles, O., Pizzera, M., Strecken, P., Gisiger, J., Gertel, E., & Suppa, A. (2022). *Politische Partizipationsformen und Motivation von Jugendlichen sich zu engagieren* (No. 15). Federal Social Insurance Office (FSIO). https://ekkj.admin.ch/fileadmin/user_upload/ekkj/04themen/10Politische_Bildung/d_23_Empfehlungen_EKKJ_zur_politischen_Partizipation_DE.pdf
- Nennstiel, R. (2021). Explaining ethnic differences in access to VET in German-speaking Switzerland: The effects of application behavior and resources. *Zeitschrift Für Soziologie*, 50(6), 396–414. <https://doi.org/10.1515/zfs02-2021-0024>
- Nennstiel, R. (2022). Positive ethnic choice effects are persistent over time but not across minority generations: Evidence from Switzerland. *Kölner Zeitschrift Für Soziologie Und Sozialpsychologie*, 74, 499–524. <https://doi.org/10.1007/s11577-022-00865-0>
- Nennstiel, R., & Brosy, Z. (2023). Less student dropout, more frequent change of study subjects: Evidence from Swiss administrative data, 1975–2018. *European Education*, 55(1), 44–59. <https://doi.org/10.1080/10564934.2023.222725>
- Nennstiel, R., & Gilgen, S. (2024). Does chubby Can get lower grades than skinny Sophie? Using an intersectional approach to uncover grading bias in German secondary schools. *PLOS ONE*, 19(7). <https://doi.org/10.1371/journal.pone.0305703>
- Neuenschwander, M. P. (2022). Schule und Beruf. In T. Hascher, T.-S. Idel, & W. Helsper (Eds.), *Handbuch Schulforschung* (p. 715–732). Springer VS. https://doi.org/10.1007/978-3-658-24729-4_33
- Neuenschwander, M. P., Hänni, S., Makarova, E., & Kaqinari, T. (2022). Hindernisse und Ressourcen eines Bildungsaufstiegs. Eine qualitative Studie mit jungen Erwachsenen mit tiefem sozioökonomischem Status und/oder Migrationshintergrund. *Schweizerische Zeitschrift für Bildungswissenschaften*, 44(2), 209–222. <https://doi.org/10.24452/sjef.44.2.4>
- Neuenschwander, M. P., Hofmann, J., Jüttler, A., & Schumann, S. (2018). Professional desires and career decisions: Effects of professional interests, role models, and internship in lower secondary school. *International Journal for Research in Vocational Education and Training*, 5(3). <https://doi.org/10.13152/IJRVET.5.3.5>
- Neuenschwander, M. P., Mayland, C., Niederbacher, E., & Garrote, A. (2021). Modifying biased teacher expectations in mathematics and German: A teacher intervention study. *Learning and Individual Differences*, 87. <https://doi.org/10.1016/j.lindif.2021.101995>
- Neuenschwander, M. P., & Schaffner, N. (2010). *Berufliche Orientierung an Schulen*. Pädagogische Hochschule FHNW. <https://irf.fhnw.ch/server/api/core/bitstreams/d712ad13-4d2a-4685-96d2-5da849b7fe4d/content>
- Neugebauer, M. (2013). Wer entscheidet sich für ein Lehramtsstudium – und warum? Eine empirische Überprüfung der These von der Negativselektion in den Lehrerberuf. *Zeitschrift für Erziehungswissenschaft*, 16(1), 157–184. <https://doi.org/10.1007/s11618-013-0343-y>
- Neugebauer, M., & Daniel, A. (2022). Higher education non-completion, employers, and labor market integration: Experimental evidence. *Social Science Research*, 105. <https://doi.org/10.1016/j.ssresearch.2022.102696>
- Neukomm, S., Amann, F., Gisiger, J., & Fontana, M.-C. (2020). *Auslegeordnung zur Positionierung der höheren Fachschulen*. econcept. https://berufsbildung2030.ch/images/pdf_de_en/Schlussbericht_Auslegeordnung_HF_DE.pdf
- Neumann, S., Tinguely, L., Hekel, N., & Brandenburg, K. (2015). *Machbarkeitsstudie Betreuungsatlas Schweiz. Die Geographie betreuter Kindheit*. Universitäres Zentrum für Frühkindliche Bildung (ZEFF). https://www.unifr.ch/zeff/fr/assets/public/files/forschung/machbarkeitsstudie_betreuungsatlas_ch.pdf
- Neumeyer, S., & Will, G. (2024). Secondary ethnic effects in the transition to higher education in Germany and their explanations. *Research in Higher Education*, 65, 1514–1539. <https://doi.org/10.1007/s11162-024-09791-w>
- Nguyen, T. D., Kramer, J. W., & Evans, B. J. (2019). The effects of grant aid on student persistence and degree attainment: A systematic review and meta-analysis of the causal evidence. *Review of Educational Research*, 89(6), 831–874. <https://doi.org/10.3102/o034654319877156>
- Niederle, M., & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics*, 122(3), 1067–1101. <https://doi.org/10.1162/qjec.122.3.1067>
- Noble, K., Magnuson, K., Duncan, G., Gennetian, L. A., Yoshikawa, H., Fox, N. A., Halpern-Meekin, S., Troller-Renfree, S., Han, S., Egan-Dailey, S., Nelson, T. D., Mize Nelson, J., Black, S., Georgieff, M., & Karhson, D. (2025). *The effect of a monthly unconditional cash transfer on children's development at four years of age: A randomized controlled trial in the U.S.* (NBER Working Paper No. 33844). National Bureau of Economic Research (NBER). <https://doi.org/10.3386/w33844>
- Obsuth, I., Murray, A. L., Knoll, M., Ribaud, D., & Eisner, M. (2023). Teacher-student relationships in childhood as a protective factor against

- adolescent delinquency up to age 17: A propensity score matching approach. *Crime & Delinquency*, 69(4), 727–755.
<https://doi.org/10.1177/00111287211014153>
- OECD [Organisation for Economic Co-operation and Development]. (2001). *Knowledge and skills for life: First results from PISA 2000*. OECD.
<https://doi.org/10.1787/9789264195905-en>
- OECD [Organisation for Economic Co-operation and Development]. (2010). *PISA 2009 Results: Overcoming social background – equity in learning opportunities and outcomes (volume II)*. OECD.
<https://doi.org/10.1787/9789264091504-en>
- OECD [Organisation for Economic Co-operation and Development]. (2012). *How does class size vary around the world? (Education Indicators in Focus No. 9)*. OECD. <https://doi.org/10.1787/5k8x7gvprjic-en>
- OECD [Organisation for Economic Co-operation and Development]. (2021a). *Education at a glance 2021: OECD indicators*. OECD.
<https://doi.org/10.1787/b35a14e5-en>
- OECD [Organisation for Economic Co-operation and Development]. (2021b). *The assessment frameworks for cycle 2 of the Programme for the International Assessment of Adult Competencies (OECD Skills Studies)*. OECD. <https://doi.org/10.1787/4bc2342d-en>
- OECD [Organisation for Economic Co-operation and Development]. (2023a). *PISA 2022 results (volume I)*. OECD.
<https://doi.org/10.1787/53f23881-en>
- OECD [Organisation for Economic Co-operation and Development]. (2023b). *PISA 2022 results (volume II)*. OECD.
<https://doi.org/10.1787/a97db61c-en>
- OECD [Organisation for Economic Co-operation and Development]. (2023c). *Shaping digital education*. OECD.
<https://doi.org/10.1787/bac4dc9f-en>
- OECD [Organisation for Economic Co-operation and Development]. (2024). *Do adults have the skills they need to thrive in a changing world? Survey of Adult Skills 2023 (OECD Skills Studies)*. OECD.
<https://doi.org/10.1787/b263dc5d-en>
- OECD [Organisation for Economic Co-operation and Development]. (2025). *Trends in adult learning: New data from the 2023 Survey of Adult Skills (Getting Skills Right)*. OECD. <https://doi.org/10.1787/eco624a6-en>
- Oggenfuss, C., & Wolter, S. C. (2021a). *Monitoring der Digitalisierung aus Sicht der Schülerinnen und Schüler: Zweite Erhebung (SCCRE Staff Paper No. 24)*. Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/staffpaper/staffpaper_24_ergaenzung_digitalisierung.pdf
- Oggenfuss, C., & Wolter, S. C. (2021b). *Monitoring der Digitalisierung der Bildung aus der Sicht der Schülerinnen und Schüler (SCCRE Staff Paper No. 22)*. Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/staffpaper/staffpaper_22_digitalisierung.pdf
- Oggenfuss, C., & Wolter, S. C. (2023). *Monitoring der Digitalisierung der Bildung aus der Sicht der Schülerinnen und Schüler: Ergänzungsbericht mit Ergebnissen der drei Erhebungen 2020–2022 (SCCRE Staff Paper No. 25)*. Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/staffpaper/staffpaper_25_monitoring-der-digitalisierung-D.pdf
- Oggenfuss, C., & Wolter, S. C. (2024). *Monitoring der Digitalisierung der Bildung aus der Sicht der Schülerinnen und Schüler: Ergänzungsbericht mit Ergebnissen der vier Erhebungen 2020–2024 (SCCRE Staff Paper No. 26)*. Swiss Coordination Centre for Research in Education (SCCRE). https://www.skbf-csre.ch/fileadmin/files/pdf/staffpaper/Staffpaper_26.pdf
- Oggenfuss, C., & Wolter, S. C. (2025). Not just gender: Multiple and persistent grade biases in language and mathematics. *European Education*, 57(2), 105–117.
<https://doi.org/10.1080/10564934.2025.2498382>
- Ohlberger, S., & Wegner, C. (2018). Bilingualer Sachfachunterricht in Deutschland und Europa. *Herausforderung Lehrer_innenbildung*, 1(1), 45–89. <https://doi.org/10.4119/UNIBI/HLZ-49>
- Okbay, A., Wu, Y., Wang, N., Jayashankar, H., Bennett, M., Nehzati, S. M., Sidorenko, J., Kweon, H., Goldman, G., Gjorgjieva, T., Jiang, Y., Hicks, B., Tian, C., Hinds, D. A., Ahlsgog, R., Magnusson, P. K. E., Oskarsson, S., Hayward, C., Campbell, A., ... Young, A. I. (2022). Polygenic prediction of educational attainment within and between families from genome-wide association analyses in 3 million individuals. *Nature Genetics*, 54(4), 437–449.
<https://doi.org/10.1038/s41588-022-01016-z>
- Olczyk, M., Gentrup, S., Schneider, T., Volodina, A., Perinetti Casoni, V., Washbrook, E., Kwon, S. J., & Waldfogel, J. (2023). Teacher judgements and gender achievement gaps in primary education in England, Germany, and the U.S. *Social Science Research*, 116.
<https://doi.org/10.1016/j.ssresearch.2023.102938>
- Olczyk, M., Kwon, S. J., Lorenz, G., Perinetti Casoni, V., Schneider, T., Volodina, A., Waldfogel, J., & Washbrook, E. (2023). Teacher judgements, student social background, and student progress in primary school: A cross-country perspective. *Zeitschrift Für Erziehungswissenschaft*, 26, 443–468. <https://doi.org/10.1007/s11618-022-01119-7>
- Osterloh, M., & Rost, K. (2025). Exploring the leaky pipeline: Tokenism, status group effects, or self-selection? *European Management Review*. <https://doi.org/10.1111/emre.70021>
- Oswald-Egg, M. E., & Renold, U. (2021). No experience, no employment: The effect of vocational education and training work experience on labour market outcomes after higher education. *Economics of Education Review*, 80. <https://doi.org/10.1016/j.econedurev.2020.102065>
- Özer, M., & Fidrmuc, J. (2024). *Education and mental health: Causal effects and intra-family spillovers (CESifo Working Paper No. 11213)*. Center for Economic Studies (CESifo).
<https://papers.ssrn.com/abstract=4908488>
- Palfy, P., Lehnert, P., & Backes-Gellner, U. (2023a). Social norms and gendered occupational choices of men and women: Time to turn the tide? *Industrial Relations: A Journal of Economy and Society*, 62(4), 380–410. <https://doi.org/10.1111/irel.12332>
- Palfy, P., Lehnert, P., & Backes-Gellner, U. (2023b). *What works for women does not work for men: A large field experiment on countering gendered occupational choices (Economics of Education Working Paper Series No. 207)*. Swiss Leading House VPET-ECON. http://repec.business.uzh.ch/RePEc/iso/leadinghouse/0207_lhwpaper.pdf
- Papageorge, N. W., & Thom, K. (2020). Genes, education, and labor market outcomes: Evidence from the Health and Retirement Study. *Journal of the European Economic Association*, 18(3), 1351–1399.
<https://doi.org/10.1093/jeea/jvz072>
- Patrinos, H. A., & Rivera-Olvera, A. (2025). The returns to education over time and the effect of Covid-19. *Applied Economics*.
<https://doi.org/10.1080/00036846.2025.2506845>
- Peter, C., & Tuch, A. (2024). *Suizidales Erleben und Verhalten – In der Bevölkerung der Schweiz 2022*. Schweizerisches Gesundheitsobservatorium (Obsan). https://www.obsan.admin.ch/sites/default/files/2024-09/obsan_bulletin_2024_08_d_1.pdf
- Peter, F., Schober, P., & Spiess, C. K. (2024). Information intervention on long-term earnings prospects and the gender gap in major choice. *European Sociological Review*, 40(2), 258–275.
<https://doi.org/10.1093/esr/jcad055>
- Petersen, J. (2013). Gender differences in identification of gifted youth and in gifted program participation: A meta-analysis. *Contemporary Educational Psychology*, 38(4), 342–348.
<https://doi.org/10.1016/j.cedpsych.2013.07.002>
- Petrucchi, F., Denecker, C., & Prosperi, O. (2022). *Impact de la crise sanitaire sur l'acquisition des compétences des élèves (Note d'information No. 81)*. Service de la recherche en éducation (SRED).
<https://www.ge.ch/document/28976/telecharger>

- Petrucci, F., Fouquet-Chauprade, B., Charmillot, S., & Felouzis, G. (2022). Tracking effects on achievement and opportunities of middle-high ability students: A case study in Switzerland. *School Effectiveness and School Improvement*, 33(1), 104–124. <https://doi.org/10.1080/09243453.2021.1942928>
- Petrucci, F., Rastoldo, F., & Roos, E. (2024). *Séparer pour adapter l'enseignement: Quand la solution devient le problème. L'effet de l'enseignement sur les acquis scolaires dans les filières du cycle d'orientation genevois*. Service de la recherche en éducation (SRED). <https://www.ge.ch/document/36887/telecharger>
- Pettersson, O. (2023). *Genetic influences on educational attainment through the lens of the evolving Swedish welfare state: A cross-level gene-environment interaction study based on polygenic indices and longitudinal register data* (p. 2023.11.02.565287). bioRxiv. <https://doi.org/10.1101/2023.11.02.565287>
- Piopiunik, M., Hanushek, E. A., & Wiederhold, S. (2014). *The impact of teacher skills on student performance across countries* (Beiträge Zur Jahrestagung Des Vereins Für Socialpolitik 2014: Evidenzbasierte Wirtschaftspolitik - Session: Education I No. A18-V3). ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationzentrum Wirtschaft. <https://hdl.handle.net/10419/100356>
- Plomin, R., & von Stumm, S. (2018). The new genetics of intelligence. *Nature Reviews Genetics*, 19(3), 148–159. <https://doi.org/10.1038/nrg.2017.104>
- Plomin, R., & von Stumm, S. (2022). Polygenic scores: prediction versus explanation. *Molecular Psychiatry*, 27, 49–52. <https://doi.org/10.1038/s41380-021-01348-y>
- Polderman, T. J. C., Benyamin, B., de Leeuw, C. A., Sullivan, P. F., van Bochoven, A., Visscher, P. M., & Posthuma, D. (2015). Meta-analysis of the heritability of human traits based on fifty years of twin studies. *Nature Genetics*, 47(7), 702–709. <https://doi.org/10.1038/ng.3285>
- Poopalapillai, S., & Buchs, H. (2023). *SVEB-Branchenmonitor 2023: Optimistische Erwartungen bei verstärktem Wettbewerb*. Swiss Federation for Adult Learning (SVEB). https://alice.ch/app/uploads/2023/08/Branchenmonitor_2023_D-1.pdf
- Portugal, P., Reis, H., Guimaraes, P., & Cardoso, A. R. (2025). *Human capital spillovers and the external returns to education* (IZA Discussion Paper No. 17690). Institute of Labor Economics (IZA). <https://papers.ssrn.com/abstract=5135861>
- Preckel, F., & Vock, M. (2021). *Hochbegabung. Ein Lehrbuch zu Grundlagen, Diagnostik und Fördermöglichkeiten*. Hogrefe. <https://www.hogrefe.com/ch/shop/hochbegabung-93001.html>
- Pregaldini, D., Balestra, S., & Backes-Gellner, U. (2025). Ethnic Diversity in Compulsory Schooling and Occupational Choices: Can Diversity Increase the Supply in Care-Oriented Occupations. *Industrial Relations: A Journal of Economy and Society*, 1–33. <https://doi.org/10.1111/irel.70101>
- Pusterla, F., & Renold, U. (2022). Does ICT affect the demand for vocationally educated workers? *Swiss Journal of Economics and Statistics*, 158. <https://doi.org/10.1186/s41937-022-00101-8>
- Pusterla, F., Schwenk, J., Strebel, A., & Zbinden, A. (2023). *Berufsfeldentwicklung vor dem Hintergrund aktueller Entwicklungen und des Strukturwandels*. Swiss Federal University for Vocational Education and Training (SFUVET). https://www.ehb.swiss/sites/default/files/2023-09/Bericht_Berufsfeldentwicklung_EHB_2023_DE_1.pdf
- Quiring, N. A. (2023). *Der Eintritt in die Universität im Spannungsfeld zwischen Automatismus und Selektivität – Die Entwicklung der Governance von Zulassungsfragen in der Schweizer Hochschulpolitik 1990 bis 2020* [Dissertation, University of Zurich]. <https://doi.org/10.5167/uzh-234533>
- Rabold, S., & Baier, D. (2007). Delinquentes Verhalten von Jugendlichen: Zur differentiellen Bedeutsamkeit verschiedener Bedingungsfaktoren. *Sozialwissenschaftlicher Fachinformationsdienst soFid*, 9–42. <https://nbn-resolving.org/urn:nbn:de:0168-ss0ar-204620>
- Rachamin, Y., Nerlich, S. E., Jäger, L., Gani, S. M. D., Favre, O., & Senn, O. (2023). Adolescents' self-reported health status, behaviours and health issues addressed during routine school doctor consultations in Switzerland: An observational study. *Swiss Medical Weekly*, 153(5). <https://doi.org/10.57187/smw.2023.40078>
- Rageth, L., & Sriharan, A. (2022). *Does familiarity with vocational and professional education shape employers' educational preferences in hiring processes?* (CES Working Paper No. 10). ETH Zurich. <https://www.research-collection.ethz.ch/server/api/core/bitstreams/bdb62761-c368-493b-a10f-c4e195a30b87/content>
- Ramseier, E., & Brühwiler, C. (2003). Herkunft, Leistung und Bildungschancen im gegliederten Bildungssystem: Vertiefte PISA-Analyse unter Einbezug der kognitiven Grundfähigkeiten. *Schweizerische Zeitschrift für Bildungswissenschaften*, 25(1), 23–58. <https://doi.org/10.25656/013675>
- Ramseier, E., Brühwiler, C., Moser, U., Zutavern, M., Berweger, S., & Biedermann, H. (2002). *Bern, St. Gallen, Zürich: Für das Leben gerüstet? Die Grundkompetenzen der Jugendlichen – Kantonalen Bericht der Erhebung PISA 2000*. Federal Statistical Office (FSO) & Swiss Conference of Cantonal Ministers of Education (EDK). https://www.sg.ch/content/dam/sgch/bildung-sport/volksschule/aus-dem-amt/pisa/PISA_2000_BE_SG_ZH_Fuer_das_Leben_geruestet.pdf
- Rattini, V. (2023). The effects of financial aid on graduation and labor market outcomes: New evidence from matched education-labor data. *Economics of Education Review*, 96. <https://doi.org/10.1016/j.econedurev.2023.102444>
- Reardon, S. F. (2013). The widening income achievement gap. *Educational Leadership*, 70(8), 10–16. <https://stonecenter.gc.cuny.edu/files/2022/09/Conwell-2.pdf>
- Reinecke, J., & Stemmler, M. (2016). *Devianz und Delinquenz im Kindes- und Jugendalter, Ungleichheitsdimensionen und Risikofaktoren*. Springer VS. <https://link.springer.com/content/pdf/10.1007/978-3-658-08135-5.pdf>
- Remund, A., & Cullati, S. (2022). *Ungleiche Lebenserwartungen bei guter Gesundheit in der Schweiz seit 1990* (Social Change in Switzerland No. 31). FORS & LIVES. <https://doi.org/10.22019/SC-2022-00006>
- Renger, S., Köller, M. M., & Möller, J. (2024). Was motiviert Schülerinnen und Schüler für das Lehramt? *Zeitschrift für Pädagogische Psychologie*, 38(4), 245–259. <https://doi.org/10.1024/1010-0652/a000338>
- Renold, U., Bolli, T., Dändliker, L., & Rageth, L. (2023). «Anerkennung von Bildungsleistungen»: Analyse bestehender Verfahren im nationalen und internationalen Kontext (CES Studien No. 40). ETH Zurich. https://edudoc.ch/nanna/record/236680/files/anerkennung_bildungsleistungen_analyse_d.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Repubblica e Cantone Ticino. (2022). *Piano di Studio della scuola dell'obbligo ticinese*. Dipartimento dell'educazione, della cultura e dello sport. <https://pianodistudio.edu.ti.ch/wp-content/uploads/2024/01/Piano-di-studio-perfezionato.pdf>
- Repubblica e Cantone Ticino. (2024). *Inclusione e accessibilità nel sistema scolastico ticinese*. Dipartimento dell'educazione, della cultura e dello sport. https://m3.ti.ch/COMUNICAZIONI/241151/1_DECS%20Inclusione%20e%20accessibilit%C3%A0%20nel%20sistema%20scolastico%20ticinese.pdf
- Resnjanskij, S., Ruhose, J., Wiederhold, S., Woessmann, L., & Wedel, K. (2024). Can mentoring alleviate family disadvantage in adolescence? A field experiment to improve labor market prospects. *Journal of Political Economy*, 132(3), 1013–1062. <https://doi.org/10.1086/726905>
- Ribeaud, D., & Loher, M. (2022). *Entwicklung von Gewalterfahrungen Jugendlicher im Kanton Zürich, 1999–2021*. Forschungsbericht. Jacobs Center for Productive Youth Development. <https://www.zh.ch/content/dam/zhweb/bilder-dokumente/footer/news/2022/09/jugendgewalt/Studie.pdf>
- Robinson-Cimpian, J. P., Lubienski, S. T., Ganley, C. M., & Copur-Gencturk, Y. (2014). Teachers' perceptions of students' mathematics proficiency

- may exacerbate early gender gaps in achievement. *Developmental Psychology*, 50(4), 1262–1281. <https://doi.org/10.1037/a0035073>
- Rockoff, J. E., Jacob, B. A., Kane, T. J., & Staiger, D. O. (2011). Can you recognize an effective teacher when you recruit one? *Education Finance and Policy*, 6(1), 43–74. https://doi.org/10.1162/EDFP_a.00022
- Rodcharoen, P., Neuhauser, A., Kalkusch, I., Schaub, S., Lanfranchi, A., Klaver, P., & Oeri, N. (2024). Behavioral self-regulation development in at-risk families: The role of family resources. *Early Child Development and Care*, 194(11–12), 1123–1137. <https://doi.org/10.1080/03004430.2024.2404001>
- Rodríguez-Planas, N., Secor, A., & De Balanzó Joue, R. (2023). Resilience-thinking training for college students: Evidence from a randomized trial (IZA Discussion Paper No. 16 627). Institute of Labor Economics (IZA). <https://hdl.handle.net/10.419/282754>
- Rohrbach-Schmidt, D., Wehner, C., Krueger, S., & Ebner, C. (2023). Wage returns to job tasks and personality traits in Germany. *International Journal of Manpower*, 44(9), 55–71. <https://doi.org/10.1108/IJM-01-2022-0038>
- Ronda, V., Agerbo, E., Bleses, D., Mortensen, P. B., Børghlum, A., Mors, O., Rosholm, M., Hougaard, D. M., Nordentoft, M., & Werge, T. (2022). Family disadvantage, gender, and the returns to genetic human capital. *The Scandinavian Journal of Economics*, 124(2), 550–578. <https://doi.org/10.1111/sjoe.12462>
- Roth, M., & Ruf, I. (2024). Ressources évaluatives pour les enseignants romandes: Une démarche intercantonale. *La Revue LEE*, 8. <https://doi.org/10.48325/rlee.008.08>
- Rothland, M., Cramer, C., & Terhart, E. (2018). Forschung zum Lehrerberuf und zur Lehrerbildung. In R. Tippelt & B. Schmidt-Hertha (Eds.), *Handbuch Bildungsforschung* (p. 1011–1034). Springer VS. https://doi.org/10.1007/978-3-531-91981-8_44
- Rumlich, D. (2018). Englischnoten und globale englische Sprachkompetenz in bilingualen Zweigen. *Zeitschrift für Erziehungswissenschaft*, 21, 29–48. <https://doi.org/10.1007/s11618-017-0801-z>
- Rupieper, L. K. K., & Thomsen, S. L. (2025). Can voluntary adult education reduce unemployment? Causal evidence from East Germany after reunification. *Journal for Labour Market Research*, 59. <https://doi.org/10.1186/s12651-024-00379-6>
- Ryser, V.-A., Meier, C., Vilpert, S., & Maurer, J. (2023). Health literacy across personality traits among older adults: Cross-sectional evidence from Switzerland. *European Journal of Ageing*, 20. <https://doi.org/10.1007/s10433-023-00774-x>
- Sahli Lozano, C., Brandenberg, K., Wicki, M., Troesch, L. M., & Wüthrich, S. (2024). The effects of accommodations and curriculum modifications on academic performance and perceived inclusion: A prospective longitudinal study among students in Switzerland. *European Journal of Special Needs Education*, 39(3), 399–414. <https://doi.org/10.1080/08856257.2023.2227527>
- Sahli Lozano, C., Crameri, S., & Gosteli, D. A. (2021). *Integrative und separate schulische Massnahmen in der Schweiz (InSeMa)*. Retrieved 20 November 2024, from <https://www.szh.ch/de/phberninsema/>
- Sahli Lozano, C., Setz, F., Wüthrich, S., & Wicki, M. (2023). Integrative Förderung für Lernende mit besonderem Bildungsbedarf – inter- und intrakantonale Heterogenität bezüglich Zielgruppe und Umsetzung. *Schweizerische Zeitschrift für Bildungswissenschaften*, 45(3), 320–334. <https://doi.org/10.24452/sjer.45.3.8>
- Sahli Lozano, C., Wüthrich, S., & Wicki, M. (2022). Chancen und Risiken von Lernzielreduktion und Nachteilsausgleich: Ausgewählte Ergebnisse einer Berner Längsschnittstudie zu Vergabe und Auswirkungen integrativer schulischer Massnahmen. *Schweizerische Zeitschrift für Heilpädagogik*, 28(12). <https://ojs.szh.ch/zeitschrift/article/view/1053>
- Sahli Lozano, C., Wüthrich, S., Wicki, M., & Brandenberg, K. (2023). Soziale Selektivität bei der Vergabe der integrativen schulischen Massnahmen reduzierte individuelle Lernziele, Nachteilsausgleich und integrative Förderung. *Zeitschrift für Erziehungswissenschaft*, 26, 997–1027. <https://doi.org/10.1007/s11618-023-01173-9>
- Sahlström, E., & Silliman, M. (2024). *The extent and consequences of teacher biases against immigrants* (IZA Discussion Paper No. 16 899). Institute of Labor Economics (IZA). <https://docs.iza.org/dp16899.pdf>
- Sallin, A. (2021). *Estimating returns to special education: Combining machine learning and text analysis to address confounding* (Discussion Paper No. 2021–09). University of St. Gallen. <https://ux-tauri.unisg.ch/RePEc/usc/econwp/EWP-2109.pdf>
- Sallin, A. (2022). *Minorities in schools – three empirical essays in education economics* [Dissertation, University of St. Gallen]. <https://www.alexandria.unisg.ch/server/api/core/bitstreams/71c464ce-cac7-414b-b003-d399e1c10eed/content>
- Salvatore, J. E., Barr, P. B., Stephenson, M., Aliev, F., Kuo, S. I.-C., Su, J., Agrawal, A., Almasy, L., Bierut, L., Bucholz, K., Chan, G., Edenberg, H. J., Johnson, E. C., McCutcheon, V. V., Meyers, J. L., Schuckit, M., Tischfield, J., Wetherill, L., & Dick, D. M. (2020). Sibling comparisons elucidate the associations between educational attainment polygenic scores and alcohol, nicotine and cannabis. *Addiction*, 115(2), 337–346. <https://doi.org/10.1111/add.14815>
- Sälzer, C., Ricking, H., & Feldhaus, M. (2024). Addressing school absenteeism through monitoring: A review of evidence-based educational policies and practices. *Education Sciences*, 14(12). <https://doi.org/10.3390/educsci14121365>
- Salzmann, P., Engelage, S., Hämmerli, C., Neumann, J., & Baumeler, C. (2022). *Anrechnungspraxis von Bildungsleistungen an höheren Fachschulen. Schlussbericht*. Swiss Federal University for Vocational Education and Training (SFUVET).
- Santos, R. M. S., Guimaraes Mendes, C., Yanq Sen Bressani, G., de Alcantara Ventura, S., Jean de Alemida Nogueira, Y., Marques de Miranda, D., & Romano-Silva, M. A. (2023). The associations between screen time and mental health in adolescents: A systematic review. *BMC Psychology*, 11. <https://doi.org/10.1186/s40359-023-01166-7>
- Savioz, M., Dutrévis, M., Guille, E., & Jendoubi, V. (2023). *La pluriprofessionnalité dans les écoles genevoises*. Service de la recherche en éducation (SRED). <https://www.ge.ch/document/33784/telecharger>
- SCCRE [Swiss Coordination Centre for Research in Education]. (2014). *Swiss Education Report 2014*. SCCRE. https://www.skbf-csre.ch/fileadmin/files/pdf/bildungsberichte/2014/bildungsbericht_14_d.pdf
- SCCRE [Swiss Coordination Centre for Research in Education]. (2018). *Swiss Education Report 2018*. SCCRE. https://www.skbf-csre.ch/fileadmin/files/pdf/bildungsberichte/2018/Bildungsbericht_Schweiz_2018.pdf
- SCCRE [Swiss Coordination Centre for Research in Education]. (2023). *Swiss Education Report 2023*. SCCRE. https://www.skbf-csre.ch/fileadmin/files/pdf/bildungsberichte/2023/BiBer_2023_D.pdf
- Schaede, U., & Mankki, V. (2022). *Quota vs quality? Long-term gains from an unusual gender quota* (CESifo Working Paper No. 9811). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.4150133>
- Schaub, S., Eberli, R., Ramseier, E., Neuhauser, A., & Lanfranchi, A. (2021). Förderung ab Geburt mit dem Programm «PAT – Mit Eltern Lernen»: Effekte im ersten Kindergartenjahr. *Swiss Journal of Educational Research*, 43(2), 285–296. <https://doi.org/10.24452/sjer.43.2.8>
- Schaupp, S., Schubert, I., Sohre, A., Petermann, L., & Nachtwey, O. (2022). *Woher kommt und wohin geht der Schweizer Klimastreik? Eine Einordnung aus soziologischer Perspektive*. Anny-Klawe-Morf-Stiftung. https://anny-klawe-morf.ch/wp-content/uploads/2022/03/AKM_D_Klimastreik_Web-1.pdf
- Scheidig, F., & Holmeier, M. (2022). Unterrichten neben dem Studium – Implikationen für das Studium und Einfluss auf das Verlangen nach hochschulischen Praxisbezügen. *Zeitschrift für Bildungsforschung*, 12, 479–496. <https://doi.org/10.1007/s35834-022-00349-3>
- Schilter, C. (2025). *How selectivity shapes selection* (Economics of Education Working Paper Series No. 236). Swiss Leading House VPET-ECON. http://repec.business.uzh.ch/RePEc/iso/leadinghouse/0236_lhwpa-per.pdf

- Schilter, C., Luethi, S., & Wolter, S. C. (2024). *Competitive peers: The way to higher paying jobs?* (IZA Discussion Paper No. 17 289). Institute of Labor Economics (IZA). <https://www.jstor.org/stable/pdf/resrep69228.pdf?acceptTC=true&coverpage=false&addFooter=false>
- Schlegel, T., & Backes-Gellner, U. (2023). The role of fields of study for the effects of higher education institutions on regional firm location. *Small Business Economics*, 61(4), 1587–1656. <https://doi.org/10.1007/s11187-023-00742-w>
- Schmidlin, S., Kobelt, E., Caviezel, U., Clerc, R., & Allemann, E. (2018). *Reduktion der Abhängigkeit von Jugendlichen und jungen Erwachsenen von der Sozialhilfe*. Federal Social Insurance Office (FSIO). https://www.gegenarmut.ch/fileadmin/kundendaten/18_April_18/7_18d_eBericht_Jugendliche_in_der_SoHi_DEF.pdf
- Schmidt, F. T. C., Fleckenstein, J., Retelsdorf, J., Eskreis-Winkler, L., & Möller, J. (2019). Measuring grit: A German validation and a domain-specific approach to grit. *European Journal of Psychological Assessment*, 35(3), 436–447. <https://doi.org/10.1027/1015-5759/a000407>
- Schmitz, M.-L., Consoli, T., Antonietti, C., Cattaneo, A., Gonon, P., & Petko, D. (2024). Examining 21st century skills in BYOD schools: From programs to practice. *Zeitschrift Für Bildungsforschung*, 14, 299–322. <https://doi.org/10.1007/s35834-024-00425-w>
- Schneider, C. (2024). *Profil de compétences transversales. Élaboration et apports théoriques d'un instrument romand. Sous la dir. de Viridiana Marc* (Document de travail 24.1001). IRDP. <https://www.irdp.ch/data/secure/4786/document/241001.pdf>
- Schneider, K. (2021). *Der Berufseinstieg von Lehrpersonen. Übergang und erste Berufsjahre im Kontext lebenslanger Professionalisierung* [Dissertation, Universität Innsbruck]. <https://doi.org/10.25656/01:21371>
- Schnell, P., & Salvi, M. (2024). *Zukunftssichere Berufe? Wie KI den Schweizer Arbeitsmarkt beeinflusst*. Avenir Suisse. https://cdn.avenir-suisse.ch/production/uploads/2025/09/zukunftssichere-berufe_kuenstliche-intelligenz-und-schweizer-arbeitsmarkt-analyse.pdf
- Schultheiss, T., & Backes-Gellner, U. (2023). Different degrees of skill obsolescence across hard and soft skills and the role of lifelong learning for labor market outcomes. *Industrial Relations: A Journal of Economy and Society*, 62(3), 257–287. <https://doi.org/10.1111/irel.12325>
- Schultheiss, T., & Backes-Gellner, U. (2024). Does updating education curricula accelerate technology adoption in the workplace? Evidence from dual vocational education and training curricula in Switzerland. *The Journal of Technology Transfer*, 49, 191–235. <https://doi.org/10.1007/s10961-022-09971-9>
- Schultheiss, T., Pfister, C., Gnehm, A.-S., & Backes-Gellner, U. (2023). Education expansion and high-skill job opportunities for workers: Does a rising tide lift all boats? *Labour Economics*, 82, 102354. <https://doi.org/10.1016/j.labeco.2023.102354>
- Seeber, M., Debacker, N., Meoli, M., & Vandeveld, K. (2023). Exploring the effects of mobility and foreign nationality on internal career progression in universities. *Higher Education*, 85, 1041–1081. <https://doi.org/10.1007/s10734-022-00878-w>
- Seifert, A., Perrig-Chiello, P., & Martin, M. (2021). *Bildungs- und Lernbedürfnisse im Alter*. Schweizerischer Verband der Seniorenuniversitäten (U3) & Verband der Schweizerischen Volkshochschulen (VSV). https://www.gerontologie.ch/fileadmin/redaktion/gerontologie/pdf/Publikationen_und_Berichte/u3_bericht_befragung_2021_de.pdf
- Seifert, E. (2024). Die Schule ist der integrativste Teil unserer Gesellschaft. *ARTISET*, 07/08, 12–15. <https://www.artiset.ch/Magazin-ARTISET/Highlights/INTEGRATIVE-SCHULE-Die-Schule-ist-der-integrativste-Teil-unserer-Gesellschaft/0e6mE7Ts/PZrAn/?searchterm=&lay=layout>
- Serdült, U., & Hofmann, G. (2022). Möglichkeiten digitaler politischer Partizipation in den Kantonen der Schweiz – wie erklären sich die grossen Unterschiede? *Jahrbuch Der Schweizerischen Verwaltungswissenschaften*, 13(1), 95–110. <https://doi.org/10.5334/ssas.172>
- SERI [State Secretariat for Education, Research and Innovation]. (2020). *Orientierungshilfe Nachhaltige Entwicklung in der Berufsbildung*. SERI. <https://backend.sbfi.admin.ch/fileservice/sdweb-docs-prod-sbfitestch-files/files/2025/02/25/6bae8309-5012-40d2-a1c0-151195a635c5.pdf>
- SERI [State Secretariat for Education, Research and Innovation]. (2021). *Politische Bildung in der Schweiz – Gesamtschau, Entwicklung 2018–2021 der politischen Bildung in der Schweiz*. SERI. <https://backend.sbfi.admin.ch/fileservice/sdweb-docs-prod-sbfitestch-files/files/2025/03/06/773c2293-9433-4c53-bc82-ae2a587af2a5.pdf>
- SERI [State Secretariat for Education, Research and Innovation]. (2022). *Orientierungshilfe Digitale Transformation: Digitale Anteile der Handlungskompetenzen im Berufsentwicklungsprozess der beruflichen Grundbildung erkennen*. SERI. https://edudoc.ch/nanna/re-cord/224435/files/Orientierungshilfe_Digitale_Transformation_d.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- SERI [State Secretariat for Education, Research and Innovation]. (2025). *Umsetzung des Weiterbildungsgesetzes: Kantonale Berichte 2024 im Rahmen der Förderung der Grundkompetenzen Erwachsener*. SERI. https://www.sbfi.admin.ch/dam/it/sd-web/V7jcoI3NFcrw/Dok_wip_20250324_Jahresberichte_2024.pdf
- Sermier Dessemontet, R., Benoit, V., & Bless, G. (2011). Schulische Integration von Kindern mit einer geistigen Behinderung. Untersuchung der Entwicklung der Schulleistungen und der adaptiven Fähigkeiten, der Wirkung auf die Lernentwicklung der Mitschüler sowie der Lehrereinstellungen zur Integration. *Empirische Sonderpädagogik*, 3(4), 291–307. <https://doi.org/10.25656/01:9329>
- Sgier, I., Schläfli, A., & Grämiger, B. (2022). *Weiterbildung in der Schweiz*. wbv Publikation. <https://dx.doi.org/10.3278/37/0573bw>
- Shan, X., & Zölitz, U. (2025). Peers affect personality development. *The Review of Economics and Statistics*, 1–45. https://doi.org/10.1162/rest_a_01557
- Sharma, S., & Sunder, N. (2025). Crime and human capital in India. *World Development*, 196. <https://doi.org/10.1016/j.worlddev.2025.107161>
- Shi, L. P., & Di Stasio, V. (2022). Finding a job after unemployment – education as a moderator of unemployment scarring in Norway and German-speaking Switzerland. *Socio-Economic Review*, 20(3), 1125–1149. <https://doi.org/10.1093/ser/mwaa056>
- SHK [Schweizerische Hochschulkonferenz]. (2023). *Grundsätze des Hochschulrats der Schweizerischen Hochschulkonferenz (SHK) für die Förderung des wissenschaftlichen Nachwuchses an universitären Hochschulen*. SHK. https://shk.ch/images/dokumentation/publikationen/HSR20231123_4.05-7d_Grundsätze_Foerderung_wissenschaftlichen_Nachwuchses_UH_195-23.pdf
- Silventoinen, K., Jelenkovic, A., Sund, R., Latvala, A., Honda, C., Inui, F., Tomizawa, R., Watanabe, M., Sakai, N., Rebato, E., Busjahn, A., Tyler, J., Hopper, J. L., Ordoñana, J. R., Sánchez-Romera, J. F., Colodro-Conde, L., Calais-Ferreira, L., Oliveira, V. C., Ferreira, P. H., ... Kaprio, J. (2020). Genetic and environmental variation in educational attainment: An individual-based analysis of 28 twin cohorts. *Scientific Reports*, 10(1). <https://doi.org/10.1038/s41598-020-69526-6>
- Simeonova, E., Currie, J., Nilsson, P., & Walker, R. (2021). Congestion pricing, air pollution, and children's health. *Journal of Human Resources*, 56, 971–996. <https://doi.org/10.3368/jhr.56.4.0218-9363R2>
- Sims, S., Fletcher-Wood, H., O'Mara-Eves, A., Cottingham, S., Stansfield, C., Van Herwegen, J., & Anders, J. (2021). *What are the characteristics of effective teacher professional development? A systematic review and meta-analysis*. Education Endowment Foundation. <https://d2tic4wvouiusb.cloudfront.net/production/documents/pages/Teacher-professional-development.pdf?v=1758819482>
- Skolverket [Nationale Bildungsbehörde Schweden]. (2022). *Förslag till nationell digitaliseringsstrategi för skolväsendet 2023–2027 [Vorschlag für eine nationale Digitalisierungsstrategie für den schulischen Bereich]*

- 2023–2027]. Skolverket. <https://www.skolverket.se/download/18.64ce3790183ff475a6421d8/1673428945704/pdfo849.pdf>
- Smith, N. R., Marshall, L., Albakri, M., Smuk, M., Hagell, A., & Stansfeld, S. (2021). Adolescent mental health difficulties and educational attainment: Findings from the UK household longitudinal study. *BMJ Open*, 11. <https://doi.org/10.1136/bmjopen-2020-046792>
- SMK [Schweizerische Maturitätskommission]. (2024). *Richtlinie zur Harmonisierung des Nachteilsausgleichs im Bereich der gymnasialen Maturität*. SMK. <https://backend.sbf.admin.ch/fileservice/sdweb-docs-prod-sbfitestch-files/files/2025/05/23/df8geed8-1486-4ad5-a576-b58e71366118.pdf>
- Snozzi, R., Müller, C. M., & Zurbriggen, C. L. A. (2025). School placement trajectories of students with special educational needs – A longitudinal analysis of administrative data. *Journal of Research in Special Educational Needs*, 25(1), 103–117. <https://doi.org/10.1111/1471-3802.12714>
- SODK & EDK [Swiss Conference of Cantonal Social Services Directors & Swiss Conference of Cantonal Ministers of Education]. (2022). *Empfehlungen zur Qualität und Finanzierung der familien- und schulgängenden Kinderbetreuung*. SODK & EDK. https://ch-sodk.s3.amazonaws.com/media/files/8d6c012a/of19/4984/82e4/b7f574c045e8/SODK_EDK_Empfehlung_Kinderbetreuung22_DE_Digital_2211.pdf
- Soguel, N., Roth, P., Bundi, P., Christen, R., & Oberle, L. (2024). *Effizienz-Monitoring der Schweizer Kantone* (No. 4). Institut de hautes études en administration publique (IDHEAP) & PwC Schweiz. <https://www.pwc.ch/de/insights/oefentlicher-sektor/effizienz-monitoring-2024.html>
- Sontheim, V. (2025). *Relative school starting age and education inequality* (Economics of Education Working Paper Series No. 244). Swiss Leading House VPET-ECON. http://repec.business.uzh.ch/RePEc/iso/leadinghouse/0244_lhwpaper.pdf
- Sorrenti, G., Zörlitz, U., Ribeaud, D., & Eisner, M. (2025). The causal impact of socio-emotional skills training on educational success. *The Review of Economic Studies*, 92(1), 506–552. <https://doi.org/10.1093/restud/rdae018>
- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355–374. <https://doi.org/10.2307/1882010>
- SSC [Swiss Science Council]. (2020). *Réflexions sur la différenciation des hautes écoles: Le cas du lien au monde professionnel*. SSC. https://files.wissenschaftsrat.ch/legacy/stories/pdf/fr/WEB_Exploratory-Study-SSC-12_019.pdf
- Stamm, H., Ceschi, M., Felber Dietrich, D., Fischer, A., Ledergerber, M., & Walter, S. (2024). *Monitoring der Gewichtsdaten der schulärztlichen Dienste der Städte Basel, Bern und Zürich. Gesundheitsförderung Schweiz*. https://gesundheitsfoerderung.ch/sites/default/files/2024-05/Faktenblatt_103_GFCH_2024-05_-_BMI_Monitoring_2022-2023.pdf.pdf
- Stans, R., Ehrmantraut, L., Siemers, M., & Pinger, P. (2025). *The impact of higher education on employer perceptions* (CESifo Working Paper No. 11714). Center for Economic Studies (CESifo). <https://dx.doi.org/10.2139/ssrn.5169570>
- Steiner, O., & Kaiser, F. (2024). Digitale Teilhabe von Menschen mit Behinderungen in der beruflichen (Weiter-)Bildung. *Education Permanente*, 1, 59–70. <https://irf.fhnw.ch/server/api/core/bitstreams/f68f9263-26c6-4b5f-825f-df1c5fd76d37/content>
- Stellmacher, A., & Pfetsch, J. (2020). Welche Gründe, berufliches Lehramt zu studieren, stehen mit der Sicherheit der Berufswahl in Verbindung? *Zeitschrift für Pädagogische Psychologie*. <https://doi.org/10.1024/1010-0652/a000290>
- Stephany, F., & Teutloff, O. (2024). What is the price of a skill? The value of complementarity. *Research Policy*, 53(1). <https://doi.org/10.1016/j.respol.2023.104898>
- Stern, S., Fliedner, J., Walther, U., & Iten, R. (2012). *Machbarkeitsstudie für eine Statistik der familienergänzenden Kinderbetreuung*. Infrast. https://www.infras.ch/media/filer_public/eb/2f/eb2f3489-9a9d-4fbd-8902-68ecarfai29/2262a_schlussbericht_1200321_gekuerzt-zur-publikation.pdf
- Stern, S., Schultheiss, A., Fliedner, J., Iten, R., & Felfe, C. (2015). *Analyse der Vollkosten und der Finanzierung von Krippenplätzen in Deutschland, Frankreich und Österreich im Vergleich zur Schweiz* (Research report No. 3/15). INFRAS und Schweizerisches Institut für Empirische Wirtschaftsforschung (SEW), University of St. Gallen. https://edudoc.ch/nanna/record/118119/files/3_15d_eBericht.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Stern, S., von Dach, A., Fries, S., Iten, R., Ostrowski, G., & Scherly, L. (2021). *Finanzierung der institutionellen Kinderbetreuung und Elterntarife*. INFRAS & Evaluanda. https://ekff.admin.ch/fileadmin/user_upload/ekff/05dokumentation/familienergäzende_kinderbetreuung/Studie_INFRAS_Finanzierung_institutionelle_Kinderbetreuung_und_Elterntarife_2021_DE.pdf
- Stern, S., von Dach, A., Wick, A., Ostrowski, G., & Scherly, L. (2022). *Evaluation Finanzhilfen für familienergänzende Kinderbetreuung: Wirkungen der Finanzhilfen für Subventionserhöhungen in Kantonen* (Research report No. 8/22). INFRAS & Evaluanda. https://www.infras.ch/media/filer_public/4e/co/4ec0ae5-8fie-4a4f-a405-76dci6e6009f/bsv_evaluation_finanzhilfen_schlussbericht_d.pdf
- Stienstra, K., Knigge, A., & Maas, I. (2024). Gene-environment interaction analysis of school quality and educational inequality. *Npj Science of Learning*, 9(1). <https://doi.org/10.1038/s41539-024-00225-x>
- Strazzeri, M., Brox, E., Oggenfuss, C., & Wolter, S. C. (2025). Early exposure to foreign language training and students' educational trajectories. *Economics of Education Review*, 108. <https://doi.org/10.1016/j.econedurev.2025.102684>
- Strello, A., Strietholt, R., Steinmann, I., & Siepmann, C. (2021). Early tracking and different types of inequalities in achievement: Difference-in-differences evidence from 20 years of large-scale assessments. *Educational Assessment, Evaluation and Accountability*, 33, 139–167. <https://doi.org/10.1007/s11092-020-09346-4>
- Strobel, A., Strobel, A., Preckel, F., & Steinmayr, R. (2024). On the interplay of motivational characteristics and academic achievement: The role of need for cognition. *AERA Open*, 10. <https://doi.org/10.1177/23328584231218961>
- Sunde, U., Dohmen, T., Enke, B., Falk, A., Huffman, D., & Meyerheim, G. (2022). Patience and comparative development. *The Review of Economic Studies*, 89(5), 2806–2840. <https://doi.org/10.1093/restud/rdabo84>
- Suter, F., Maag Merki, K., Feldhoff, T., Arndt, M., Castelli, L., Gyger Gaspoz, D., Jude, N., Mehmeti, T., Plata, A., Radisch, Selick, F., Sposato, G., & Zaugg, A. (2023). *Erfahrungen von Schulleiter*innen in der deutsch-, italienisch- und französischsprachigen Schweiz im Schuljahr 2021/2022 während der Covid-19-Pandemie. Zentrale Ergebnisse aus der Studie S-CLEVER+. Schulentwicklung vor neuen Herausforderungen*. https://s-clever.org/wp-content/uploads/2023/04/S-CLEVER_2023_CH-Ergebnisbericht.pdf
- Suter, L., Bernath, J., Willemse, I., Külling, C., Waller, G., Skirgaila, P., & Süss, D. (2023). *MIKE – Medien, Interaktion, Kinder, Eltern: Ergebnisbericht zur MIKE-Studie 2021*. Zürcher Hochschule für Angewandte Wissenschaften (ZHAW). https://www.zhaw.ch/storage/psychologie/upload/forschung/medienpsychologie/mike/Bericht_MIKE-Studie_2021.pdf
- Sutter, C. C., Stickl Haugen, J., Campbell, L. O., & Tinstman Jones, J. L. (2023). School and electronic bullying among adolescents: Direct and indirect relationships with sadness, sleep, and suicide ideation. *Journal of Adolescence*, 95(1), 82–96. <https://doi.org/10.1002/jad.12101>
- Sutter, M., Zoller, C., & Glätzle-Rützler, D. (2019). Economic behavior of children and adolescents – a first survey of experimental economics results. *European Economic Review*, 111, 98–121. <https://doi.org/10.1016/j.euroecorev.2018.09.004>
- swissuniversities. (2015). *Zulassung zum Bachelorstudium an Fachhochschulen: Best practices*. swissuniversities. https://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/Kammern/Kammer_FH/Best_practice/ZulBa_BestPractices_de.pdf

- swissuniversities. (2021a). *Qualifikationsrahmen für den schweizerischen Hochschulbereich*. swissuniversities. <https://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/Lehre/NQR/nqf-ch-HS-d.pdf>
- swissuniversities. (2021b). *Sonderprogramm Humanmedizin: Schlussbericht von swissuniversities zum Sonderprogramm «Erhöhung der Anzahl Abschlüsse in Humanmedizin» vom 02. Dezember 2021*. swissuniversities. https://www.swissuniversities.ch/fileadmin/swissuniversities/Dokumente/Lehre/Medizin/211202_Schlussbericht_SPHM.pdf
- Syring, M., Merk, S., Cramer, C., Topalak, C., & Bohl, T. (2019). Der Migrationshintergrund Lehramtsstudierender als Prädiktor ihrer Einstellungen zu heterogenen Lerngruppen. *Zeitschrift für Bildungsforschung*, 9, 201–219. <https://doi.org/10.1007/s35834-019-00236-4>
- Tafreschi, D., & Thiemann, P. (2016). Doing it twice, getting it right? The effects of grade retention and course repetition in higher education. *Economics of Education Review*, 55, 198–219. <https://doi.org/10.1016/j.econedurev.2016.10.003>
- Tarantini, E. (2023). *Kompetenzentwicklung von Lehrpersonen zur Gestaltung der digitalen Transformation in Schulen* [Dissertation, University of St. Gallen]. <https://nbn-resolving.org/urn:nbn:ch:bel-2457652>
- Terrin, E., & Triventi, M. (2022). The effect of school tracking on student achievement and inequality: A meta-analysis. *Review of Educational Research*, 93(2), 236–274. <https://doi.org/10.3102/00346543221100850>
- Thurnherr, G., Schönenberger, S., & Brühwiler, C. (2013). Hilfreiche Unterstützung in der Berufsorientierung aus Sicht von Jugendlichen. In U. Faßhauer, B. Fürstenau, & E. Wuttke (Eds.), *Jahrbuch der berufs- und wirtschaftspädagogischen Forschung 2013* (p. 259–270). Verlag Barbara Budrich. <https://doi.org/10.25656/01:8080>
- Thyoff, J., Scheller, J., Schneider, C., & Waldis, M. (2020). Politische Bildung auf Sekundarstufe I. Erscheinungsformen und Herausforderungen am Beispiel von Unterrichtssequenzen zu «Europa – EU – Schweiz». *Schweizerische Zeitschrift für Bildungswissenschaften*, 42(1), 127–147. <https://doi.org/10.24452/sjz.42.1.8>
- Tjaden, J. D., & Scharenberg, K. (2017). Ethnic choice effects at the transition into upper-secondary education in Switzerland. *Acta Sociologica*, 60(4), 309–324. <https://doi.org/10.1177/0001699316679491>
- Tobback, I., Verhaest, D., & Baert, S. (2024). Internships, hiring outcomes and underlying mechanisms: A stated preferences experiment. *De Economist*, 172, 25–48. <https://doi.org/10.1007/s10645-023-09432-0>
- Toppeta, A., Carneiro, P. M., & Reis, H. (2024). *Parental investments and socio-economic gradients in learning across European countries* (The University of Chicago Stone Center Working Paper Series No. 24–05). The University of Chicago Stone Center. <https://dx.doi.org/10.2139/ssrn.4903545>
- Torney-Purta, J., Lehmann, R., Oswald, H., & Schulz, W. (2001). *Citizenship and education in twenty-eight countries: Civic knowledge and engagement at age fourteen*. (2001). IEA. https://www.iea.nl/sites/default/files/2019-04/CIVED_Phase2_Age_Fourteen.pdf
- Trede, I., Hänni, M., Leumann, S., Neumann, J., Gehret, A., Schweri, J., & Kriesi, I. (2020). *Berufsmaturität. Bildungsverläufe, Herausforderungen und Potenziale* (Trendbericht No. 4). Eidgenössisches Hochschulinstitut für Berufsbildung (SFUVET). https://www.ehb.swiss/sites/default/files/trendbericht_4_de_vi-web.pdf
- Troesch, L. M., Aksoy, D., & Bauer, C. E. (2019). Motiviert für den Berufswechsel: Spielt der frühere berufliche Status eine Rolle? In N. Safi, C. E. Bauer, & M. Kocher (Eds.), *Lehrberuf: Vorbereitung, Berufseinstieg, Perspektiven* (p. 21–33). hep Verlag. <https://phrepo.phbern.ch/2186/>
- Tulowitzki, P., Pietsch, M., Grigoleit, E., & Sposato, G. (2024). Der Einfluss von sozialer Unterstützung und Arbeitsengagement auf transformationale Führung an Schweizer Schulen in sozial benachteiligter und begünstigter Lage. Befunde einer nationalen Befragung von Schulleitungen. *Schweizerische Zeitschrift für Bildungswissenschaften*, 46(1), 30–46. <https://doi.org/10.25656/01:30089>
- Tulowitzki, P., Sposato, G., & Pietsch, M. (2023). *Schulleitungsmonitor Schweiz 2023 – Befunde zu Selektion und Kommunikation*. Pädagogische Hochschule FHNW. <https://doi.org/10.26041/fhnw-8255>
- Turk, E., van den Heuvel, M. I., Sleurs, C., Billiet, T., Uytendaele, A., Sunaert, S., Mennes, M., & Van den Bergh, B. R. H. (2023). Maternal anxiety during pregnancy is associated with weaker prefrontal functional connectivity in adult offspring. *Brain Imaging and Behavior*, 17(6), 595–607. <https://doi.org/10.1007/s11682-023-00787-1>
- Turkheimer, E. (2000). Three laws of behavior genetics and what they mean. *Current Directions in Psychological Science*, 9(5), 160–164. <https://doi.org/10.1111/1467-8721.00084>
- Turkheimer, E., Haley, A., Waldron, M., D'Onofrio, B., & Gottesman, I. I. (2003). Socioeconomic status modifies heritability of IQ in young children. *Psychological Science*, 14(6), 623–628. <https://doi.org/10.1046/j.0956-7976.2003.psci.1475.x>
- UNECE [United Nations Economic Commission for Europe]. (2023). *Modèle de rapport sur l'application de la Stratégie de la Commission économique pour l'Europe pour l'éducation en vue du développement durable de 2021 à 2025*. UNECE. https://unece.org/sites/default/files/2023-04/ece_cep_ac.13_2023_4.f.pdf
- United Nations. (2015). *Transformation unserer Welt: Die Agenda 2030 für nachhaltige Entwicklung*. United Nations. <https://www.un.org/german/sites/default/files/2024-09/ar70001.pdf>
- van de Wetering, J., Leijten, P., Spitzer, J., & Thomaes, S. (2022). Does environmental education benefit environmental outcomes in children and adolescents? A meta-analysis. *Journal of Environmental Psychology*, 81. <https://doi.org/10.1016/j.jenvp.2022.101782>
- van Lent, M. (2025). Peer creativity and academic achievement. *Economics of Education Review*, 106. <https://doi.org/10.1016/j.econedurev.2025.102649>
- Veenhoven, R. (2018). Subjective well-being in nations. In E. Diener, Oishi, Shigehiro, & L. Tay (Eds.), *Handbook of Well-being*. DEF Publishers. <https://personal.eur.nl/veenhoven/Pub2010s/2018a-full.pdf>
- Veenman, S. (1995). Cognitive and noncognitive effects of multigrade and multi-age classes: A best-evidence synthesis. *Review of Educational Research*, 65(4), 319–381. <https://www.jstor.org/stable/1170701>
- Vogt, F., Koechlin, A., Truniger, A., & Zumwald, B. (2021). Teaching assistants and teachers providing instructional support for pupils with SEN: Results from a video study in Swiss classrooms. *European Journal of Special Needs Education*, 36(2), 215–230. <https://doi.org/10.1080/08856257.2021.1901373>
- Vogt, F., Stern, S., & Fillietaz, L. (2022). *Frühe Sprachförderung: Internationale Forschungsbefunde und Bestandesaufnahme zur frühen Sprachförderung in der Schweiz*. Pädagogische Hochschule St. Gallen, Infras & Université de Genève. <https://doi.org/10.18747/phsg-coll3/id/1659>
- Vogt, F., Zumwald, B., Urech, C., & Abt, N. (2010). *EDK-Ost 4bis8 [vier-bis-acht]. Schlussbericht der formativen Evaluation. Grund- [und] Basisstufe: Umsetzung, Unterrichtsentwicklung und Akzeptanz bei Eltern und Lehrpersonen*. Schulverlag plus. <https://www.fachportal-paedagogik.de/literatur/vollanzeige.html?Fid=3302200>
- von Simson, K., Brekke, I., & Hardoy, I. (2022). The impact of mental health problems in adolescence on educational attainment. *Scandinavian Journal of Educational Research*, 66(2), 306–320. <https://doi.org/10.1080/00313831.2020.1869077>
- Wagner, L., & Ruch, W. (2023). Displaying character strengths in behavior is related to well-being and achievement at school: Evidence from between- and within-person analyses. *The Journal of Positive Psychology*, 18(3), 460–480. <https://doi.org/10.1080/17439760.2022.2109196>
- Wang, B., Baldwin, J. R., Schoeler, T., Cheesman, R., Barkhuizen, W., Dudbridge, F., Bann, D., Morris, T. T., & Pingault, J.-B. (2021). Robust genetic nurture effects on education: A systematic review and meta-analysis based on 38,654 families across 8 cohorts. *The American Journal of Human Genetics*, 108(9), 1780–1791. <https://doi.org/10.1016/j.ajhg.2021.07.010>

- Watt, H. M. G., Richardson, P. W., Klusmann, U., Kunter, M., Beyer, B., Trautwein, U., & Baumert, J. (2012). Motivations for choosing teaching as a career: An international comparison using the FIT-Choice scale. *Teaching and Teacher Education*, 28(6), 791–805. <https://doi.org/10.1016/j.tate.2012.03.003>
- Weinberg, J. (2022). Civic education as an antidote to inequalities in political participation? New evidence from English secondary education. *British Politics*, 17, 185–209. <https://doi.org/10.1057/s41293-021-00186-4>
- Weinert, S., & Ebert, S. (2013). Spracherwerb im Vorschulalter. *Zeitschrift für Erziehungswissenschaft*, 16, 303–332. <https://doi.org/10.1007/s11618-013-0354-8>
- Weinschenk, A. C., & Dawes, C. T. (2022). Civic education in high school and voter turnout in adulthood. *British Journal of Political Science*, 52(2), 934–948. <https://doi.org/10.1017/S0007123420000435>
- Weissenbacher, B., Koschmieder, C., Krammer, G., Müller, F. H., Hecht, P., Knitel, D., König, B., Schaupp, H., & Neubauer, A. (2019). Der Studien- und Berufserfolg von (angehenden) Lehrkräften in Österreich im Längsschnitt – ausgewählte Befunde aus dem ersten Studienjahr. *Beiträge zur Lehrerinnen- und Lehrerbildung*, 37(1), 42–56. <https://doi.org/10.25656/01:19060>
- Wickersham, A., Sugg, H. V. R., Epstein, S., Stewart, R., Ford, T., & Downs, J. (2021). Systematic review and meta-analysis: The association between child and adolescent depression and later educational attainment. *Journal of the American Academy of Child & Adolescent Psychiatry*, 60(1), 105–118. <https://doi.org/10.1016/j.jaac.2020.10.008>
- Wilhelmi, B. (2022). *Betriebliche Ausbildungsstrategien zur Berufsmaturität I* (TREE Working Paper No. 6). TREE. <https://doi.org/10.48350/177100>
- Willeck, C., & Mendelberg, T. (2022). Education and political participation. *Annual Review of Political Science*, 25(1), 89–110. <https://doi.org/10.1146/annurev-polisci-05120-014235>
- Woessmann, L. (2025). *Skills and earnings: A multidimensional perspective on human capital*. 17. <https://doi.org/10.1146/annurev-economics-081324-081733>
- Wolter, S. C., Lüthi, S., & Zumbühl, M. (2020). *Effizienz im Schweizer Bildungssystem*. University of Bern. https://edudoc.ch/nanna/record/209200/files/effizienz_expertenbericht_d.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Wolter, S. C., & Zöllner, T. (2025). Are parents an obstacle to gender-atypical occupational choices? *Journal of Population Economics*, 38. <https://doi.org/10.1007/s00148-025-01121-3>
- Woodley Of Menie, M. A., Peñaherrera-Aguirre, M., Dunkel, C. S., & Sarraf, M. A. (2021). Evidence for the Scarr-Rowe effect on genetic expressivity in the Health and Retirement Study. *Twin Research and Human Genetics: The Official Journal of the International Society for Twin Studies*, 24(2), 110–115. <https://doi.org/10.1017/thg.2021.13>
- Wunsch, C. (2014). *Arbeits- und Fachkräftebedarf der Schweiz bis 2060*. University of Basel. https://www.unibas.ch/fileadmin/user_upload/www/00_Professuren/Wunsch_Arbeitsmarktoekonomie/Forschung/7_Abschlussbericht_Arbeits- und Fachkraeftebedarf_der_Schweiz_bis_2060.pdf
- Wyss, A. M., Knoch, D., & Berger, S. (2022). When and how pro-environmental attitudes turn into behavior: The role of costs, benefits, and self-control. *Journal of Environmental Psychology*, 79. <https://doi.org/10.1016/j.jenvp.2021.101748>
- Zamora, P., Schafroth, C., & Röder, C. (2020). *Die politische Bildung in der Schweiz*. Anny-Klawar-Morf-Stiftung. https://anny-klawa-morf.ch/wp-content/uploads/2020/11/AKM_Politische_Bildung_Web.pdf
- Zanga, G., & De Gioannis, E. (2023). Discrimination in grading: A scoping review of studies on teachers' discrimination in school. *Studies in Educational Evaluation*, 78. <https://doi.org/10.1016/j.stueduc.2023.101284>
- Zanolla, G., & Petrucci, F. (2024). Cosa c'è dietro a un voto? *IUL Research*, 5(9), 8–22. <https://doi.org/10.57568/iulresearch.v5i9.567>
- ZEM CES [Schweizerisches Zentrum für die Mittelschule und für Schulevaluation auf der Sekundarstufe II]. (2021). *Weiterbildungsbarometer 2021*. ZEM CES. https://www.zemces.ch/download/pictures/37/h7fawyonev13fzr5uctigxwx7d9jch/weiterbildungsbarometer_2021.pdf
- ZEM CES [Schweizerisches Zentrum für die Mittelschule und für Schulevaluation auf der Sekundarstufe II]. (2022a). *Bericht Nachteilsausgleich: Bestandsaufnahme der Umsetzung des Nachteilsausgleichs auf der Sekundarstufe II Allgemeinbildung in den Kantonen*. ZEM CES. https://www.zemces.ch/download/pictures/27/gh9ikih87usyhy-k11689oioe9pu8i/bericht_nachteilsausgleich_final_d.pdf
- ZEM CES [Schweizerisches Zentrum für die Mittelschule und für Schulevaluation auf der Sekundarstufe II]. (2022b). *Nationale Bestandsaufnahme zur Umsetzung von BYOD Konzepten und zur Nutzung von Online-Bewertungsinstrumenten an Gymnasien und FMS*. ZEM CES. https://www.zemces.ch/download/pictures/fc/ttmjza2nr789nkvs-makf43ayqu3h6d/220530_bericht_byod.pdf
- ZEM CES [Schweizerisches Zentrum für die Mittelschule und für Schulevaluation auf der Sekundarstufe II]. (2022c). *Weiterbildungsbarometer 2022*. ZEM CES. https://www.zemces.ch/download/pictures/8f/tlxxesdhhee4qdhy81w65yg6su9yqq/weiterbildungsbarometer_2022.pdf
- ZEM CES [Schweizerisches Zentrum für die Mittelschule und für Schulevaluation auf der Sekundarstufe II]. (2023). *Weiterbildungsbarometer 2023*. ZEM CES. https://www.zemces.ch/download/pictures/ca/71bf64sj-ba8ikd13338gdh2gxqr4/barometer_23_de_231010.pdf
- ZEM CES [Schweizerisches Zentrum für die Mittelschule und für Schulevaluation auf der Sekundarstufe II]. (2025). *Bericht zum Stand der Umsetzung der basalen fachlichen Kompetenzen für die allgemeine Studierfähigkeit (BfKA)*. ZEM CES. https://edudoc.ch/nanna/record/243242/files/bericht_zemces_bfka.pdf?withWatermark=0&withMetadata=0&registerDownload=1&version=1
- Zimmermann, B., & Seiler, S. (2019). The relationship between educational pathways and occupational outcomes at the intersection of gender and social origin. *Social Inclusion*, 7(3), 79–94. <https://doi.org/10.17645/si.v7i3.2035>
- ZIVI [Bundesamt für Zivildienst]. (2024). *Einsatz in Schulen*. Retrieved 5 December 2024, from <https://www.zivi.admin.ch/de/einsatz-schulen>
- Zumbühl, M., Hof, S., & Wolter, S. C. (2025). Private tutoring and academic achievement in a selective education system. *Education Economics*, 33(4), 613–630. <https://doi.org/10.1080/09645292.2024.2382990>
- Zumbühl, M., & Wolter, S. C. (2017). *Wie weiter nach der obligatorischen Schule?* (SCCRE Staff Paper No. 20). Swiss Coordination Centre for Research in Education (SCCRE). <https://skbf-csre.ch/fileadmin/files/pdf/publikationen/Staffpaper20d.pdf>

ANNEX

Abbreviations

AFDHE	Advanced Federal Diploma of Higher Education
AFPE	Advanced Federal Professional Examination
AG	Aargau
AI	Appenzell Innerrhoden
AI	Artificial Intelligence
ALL	Adult Literacy and Lifeskills
AR	Appenzell Ausserrhoden
ASBOS	Adaptation of Student Statistics to the Bologna System
AT	Austria
AU	Australia
Bac	(Academic) Baccalaureate
BE-d	Bern, German-speaking
BE-f	Bern, French-speaking
BE	Belgium
BE	Bern
BEJUNE	Berne, Jura, Neuchâtel
BFH	Bern University of Applied Sciences
BL	Basel Landschaft
BR NWCH	Bildungsraum Nordwestschweiz
BS	Basel Stadt
BYOD	Bring your own device
CA	Canada
CAS	Certificate of Advanced Studies
CCO	Central Compensation Office
CEDEFOP	European Centre for the Development of Vocational Training
CHF	Swiss franc
CH	Switzerland
CIIP	Conférence intercantonale de l'instruction publique et de la culture de la Suisse romande et du Tessin
CLACESO	Conférence latine des chef.fe.s d'établissements de la scolarité obligatoire
COME-HERE	COVID-19, MEntal HEalth, REsilience and Self-regulation
CPI	Swiss Consumer Price Index
CZ	Czech Republic
D-CH	German-speaking Switzerland
DAS	Diploma of Advanced Studies
DE	Germany
DFA	Dipartimento formazione e apprendimento
DK	Denmark
DNA	Deoxyribonucleic acid
EA PGI	Educational Attainment Polygenic Index
ECTS	European Credit Transfer and Accumulation System
EDK-IDES	Swiss Conference of Cantonal Ministers of Education, Information and documentation centre
EDK	Swiss Conference of Cantonal Ministers of Education
EE	Estonia
EFTA	European Free Trade Association
EHA	Graduate Survey

eHBB	Survey on professional education
EPFL	École polytechnique fédérale de Lausanne
ES	Spain
ETH	Federal Institutes of Technology
ETHZ	ETH Zurich
EU	European Union
EVAMAR	Evaluation of Regulation on the Recognition of the Baccalaureate
F-CH	French-speaking Switzerland
FC	Federal Constitution
FDHE	Federal Diploma of Higher Education
FFA	Federal Finance Administration
FHGR	University of Applied Sciences of the Grisons
FHNW	University of Applied Sciences and Arts Northwestern Switzerland
FHV	Intercantonal Agreement on Universities of Applied Sciences
FI	Finland
FMS	Upper-secondary specialised school
FORS	Swiss Centre of Expertise in the Social Sciences
FPE	Federal Professional Examination
FR-d	Fribourg, German-speaking
FR-f	Fribourg, French-speaking
FR	France
FR	Fribourg
FSIO	Federal Social Insurance Office
FSO	Federal Statistical Office
FTE	Full-time equivalents
FVB	Federal Vocational Baccalaureate
FVB1	Federal Vocational Baccalaureate during the apprenticeship
FVB2	Federal Vocational Baccalaureate after the apprenticeship
GDP	Gross domestic product
GE	General education
GE	Geneva
GL	Glarus
GPS	Global Preferences Survey
GR	Grisons
GR	Greece
HBSC	Health Behaviour in School-aged Children
HEdA	Federal Act on the Funding and Coordination of the Higher Education Sector
HEI	Higher education institutions
HEP	Hautes écoles pédagogiques
HES-SO	Haute école spécialisée de la Suisse occidentale
HfH	Hochschule für Heilpädagogik
HR	Croatia
HSK	Study Programmes at Professional Education Institutions
HSLU	Lucerne University of Applied Sciences and Arts
HU	Hungary

IAS	Institutes of Applied Sciences
I-CH	Italian-speaking Switzerland
ICA-PEI	Intercantonal Agreement on Funding Contributions for Study Programmes at Professional Education Institutions
ICT	Information and Communications Technology
IE	Ireland
IFES IPES	Institute for External School Evaluations at Upper-Secondary Level
IHEID	Institut des hautes études internationales et du développement
IL	Israel
ILO	International Labour Organization
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
IT	Italy
IUV	Intercantonal University Agreement
JP	Japan
JU	Jura
Kal FH	Kalaidos University of Applied Sciences
KR	South Korea
LABB	Longitudinal analyses in the field of education
LENA	National platform for apprenticeship
LFS	EU Labour Force Survey
LS	Lausanne
LT	Lithuania
LTO	Long-term orientation
LU	Luxembourg
LU	Lucerne
LV	Latvia
MAR	Regulation on the Recognition of the Baccalaureate
MAS	Master of Advanced Studies
MAV	Ordinance on Recognition of Academic Baccalaureates
MiR-PEI	Minimum Requirements for the Recognition of Study Programmes and Continuing Education and Training at Professional Education Institutions
NAG	Compensation of disadvantages
NEET	Not in Education, Employment or Training
NE	Neuchâtel
NFE	New system of fiscal equalisation and division of tasks
NL	Netherlands
NO	Norway
NW	Nidwalden
NZ	New Zealand
OASI	Old Age and Survivor's Insurance
OECD	Organization for Economic Cooperation and Development
OST	Eastern Switzerland University of Applied Sciences
OW	Obwalden
PEI	Professional education institution
PE	Professional education

PER	Plan d'études romand
PGI	Polygenic index
PhD	Doctorate
PIAAC	Programme for the International Assessment of Adult Competencies
PiBS	Practice integrated Bachelor
PISA	Programme for International Student Assessment
PL	Poland
PT	Portugal
QP	Qualification procedure
RO	Romania
SBG-SFPI	Vocational education and training statistics
SB	Specialised Baccalaureate
SCCRE	Swiss Coordination Centre for Research in Education
SDG	Sustainable Development Goals
SEATS II	Swiss Education Attainment and Transition Study (PISA 2022 + LABB)
SEATS I	Swiss Education Attainment and Transition Study (PISA 2012 + LABB)
Sec II	Upper-secondary education
Sec I	Lower-secondary education
SECO	State Secretariat for Economic Affairs
SEnOF	Service de l'enseignement obligatoire de langue française
SERI	State Secretariat for Education, Research and Innovation
SES	Socioeconomic status
SE	Sweden
SFUVET	Swiss Federal University for Vocational Education and Training
SG	St. Gallen
SHIS-PERS	Statistics on Higher Education Staff of the Swiss Higher Education Information System
SHIS-studex	Statistics on Students and Degrees of the Swiss Higher Education Information System
SH	Schaffhausen
SILC	Statistics on Income and Living Conditions
SI	Slovenia
SK	Slovakia
SLFS	Swiss Labour Force Survey
SLMS	Schulleitungsmonitor Schweiz
SMK	Schweizerische Maturitätskommission
SMP	Swiss baccalaureate examination
SNSF	Swiss National Science Foundation
SO	Solothurn
SSEE	Social and Economic Conditions of Student Life
SSP	Statistics on School Staff
STEM	Science, technology, engineering and mathematics
SUPSI	Scuola universitaria professionale della Svizzera italiana
SVEB	Swiss Federation for Adult Learning
SZ	Schwyz
TG	Thurgau

TI	Ticino
UAS	Universities of Applied Sciences
ÜGK	Review of the national education objectives
UK	United Kingdom
UNI	(Academic) Universities
UR	Uri
USA	United States of America
USI	Università della Svizzera italiana
UTE	Universities of teacher education
VD	Vaud
VETC	Federal VET Certificate
VETD	Federal VET Diploma
VET	Vocational education and training
VS-d	Valais, German-speaking
VS-f	Valais, French-speaking
VSLCH	School Leadership Association Switzerland
VS	Valais
WVSA	World Values Survey Association
ZEM CES	Swiss Centre for Secondary Schools and for School Evaluations at Upper-Secondary Level
ZG	Zug
ZHAW	Zurich University of Applied Sciences
ZHdK	Zurich University of the Arts
ZH	Zurich

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