OECD Reviews of Vocational Education and Training

A Skills beyond School Review of Switzerland

Mihály Fazekas and Simon Field

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Acronyms and key terms

Advanced Federal Professional Education and Training (PET) Diploma (*eidgenössisches Diplom*).

Advanced Federal Professional Education and Training (PET) Diploma Examination (*höhere Fachprüfung*).

Federal Office for Professional Education and Technology, OPET (*Bundesamt für Berufsbildung und Technologie, BBT*) professional colleges (*höhere Fachschulen*).

Federal Professional Education and Training (PET) Diploma (*eidgenössischer Fachausweis*).

Federal Professional Education and Training (PET) Diploma Examination (*Eidgenössische Berufsprüfung*).

Preparatory course (*vorbereitender Kurs*).

Professional education and training (PET).

Universities and Federal Institutes of Technology (referred to as universities throughout this report).

University of Applied Science (*Fachhochschulen*) (UAS).

Summary: strengths, challenges and recommendations

Strengths

- Employers and professional associations are engaged with and actively contribute to professional education and training (PET). The system is highly responsive to labour market needs.
- Policy development has a strong institutional leadership in the Federal Office for Professional Education and Technology (OPET), allowing consensus among stakeholders to be balanced by policy development and reform.
- The system offers a flexible and effective response to diverse student requirements, with part-time, evening, weekend and modular provision.
- Work-based learning is generally well integrated into PET programmes, with work linked to study for part-time students, and substantial internships for full-time students.
- The professional exams effectively link upskilling to recognition of prior learning.
- The PET system is well articulated with upper secondary VET, offering a wide range of progression opportunities for graduate apprentices.
- Teachers and trainers in professional colleges are well prepared both in their vocational field and in pedagogy.
- While international recognition of PET programmes and qualifications remains a challenge, it can build on the already established high status of certain programmes.

Challenges and recommendations

- There are some potential financial and non-financial barriers to access to PET, and government financial support may be biased towards academic tertiary education.
  - *On a pilot basis, explore whether a loan and grant scheme would remove an access barrier to participation in PET.*
- In contrast to most other sectors of education and training, inter-cantonal arrangements for funding PET are haphazard, leading to confusion, unfairness and inefficiency.
  - *As already envisaged by the Swiss authorities, implement an effective inter-cantonal financial agreement allowing for consistent and co-ordinated funding across cantons in support of an effective PET market.*
- Information on the quality and costs of PET courses is inadequate, and there are quality weaknesses in some areas.
  - *Collect and disseminate better information from PET providers on course quality and costs. Encourage industry self-regulation of preparatory courses to ensure high and consistent standards.*
- Globalisation is putting a number of different pressures on the Swiss PET system, intensifying the need for international recognition of Swiss PET qualifications and demanding new higher level and sometimes globally defined competencies as part of many jobs.
  - *Respond actively to globalisation and technological change by: i) improved permeability and collaboration between PET and academic tertiary education; and ii) strengthened international network building on sectoral and professional college levels.*
- Numeracy and literacy are of increasing importance in professional occupations, and the PET system, alongside other parts of the Swiss education system need to address them more effectively.
  - *Encourage a stronger emphasis on numeracy and literacy in professional colleges, especially by introducing targeted measures for remediating basic skills gaps identified on entry.*

Chapter 1

Introduction and initial assessment

This chapter describes the OECD policy study of postsecondary vocational education and training (VET), the review of Switzerland, summarises the main features of the country system and sets out an assessment of its strengths and challenges.

The policy review of Switzerland and its place in the wider OECD study

This review is one of a series of country reports on postsecondary vocational education and training (VET) in OECD countries, prepared as part of an OECD study (see Box 1.1). The series includes *reviews*, (such as this one) involving an in-depth analysis of a country system leading to a set of policy recommendations backed by analysis. In addition there are *commentaries*. These simpler exercises are largely descriptive but also including an assessment of strengths and challenges in the country system. The commentaries are designed to be of value as free-standing reports, but are also prepared so that they can become the first phase of a full review, should a country so wish.

Box 1.1 Skills beyond School: the OECD study of postsecondary vocational education and training

Increasingly countries look beyond secondary school to more advanced qualifications to provide the skills needed in many of the fastest growing technical and professional jobs in OECD economies. The OECD study, *Skills beyond School,* is addressing the range of policy questions arising, including funding and governance, matching supply and demand, quality assurance and equity and access. The study will build on the success of the previous OECD study of vocational education and training *Learning for Jobs* which examined policy through 17 country reviews and a comparative report. The study also forms part of the horizontal OECD *Skills Strategy* (OECD, 2012).

Full country policy reviews are being conducted in Austria, Denmark, Egypt, Germany, Israel, Korea, the Netherlands, Switzerland, the United Kingdom (England), and the United States (with case studies of Florida, Maryland and Washington State). Shorter exercises leading to an OECD country commentary will be undertaken in Belgium (Flanders), Canada, Iceland, Romania, Spain, Sweden and in Northern Ireland and Scotland in the United Kingdom. Background reports will be prepared in all these countries, and in France, Hungary and Mexico.

See: www.oecd.org/education/vet

This review follows a standard methodology. Switzerland initially prepared a country background report. An OECD team then made two visits to Switzerland on 26 - 29 April and 14 - 17 June 2011, where they discussed the issues arising with a very wide range of stakeholders.

The structure of the report

This first chapter places the review of Switzerland in the context of the wider OECD study, presents the structure of the report, describes the main features of the Swiss postsecondary VET system, and compares its main features with those of other countries. It also sets out a number of key statistical indicators comparing Switzerland with other OECD countries. These cover both the education system and the labour market, including the changing mix of occupations in the labour market. It also provides an appreciation of the main strengths of the system, and briefly outlines the challenges to be addressed in the second chapter.

The second chapter advances policy recommendations, set out as:

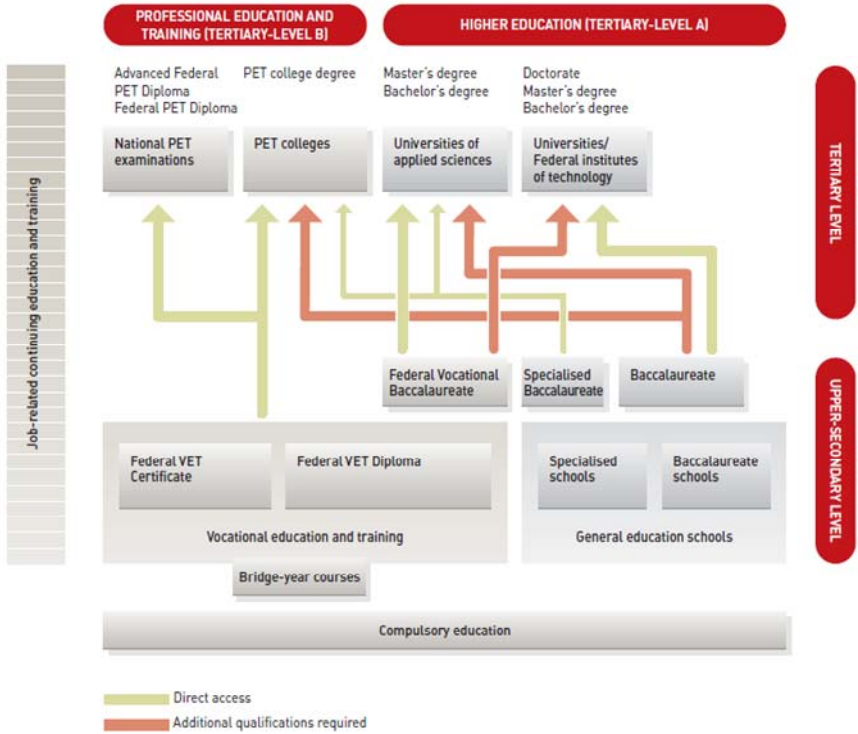
- *The challenge* – the problem that gives rise to the recommendation.
- *The recommendation* – the text of the recommendation.
- *The supporting arguments* – the evidence that supports the recommendation.

A snapshot of the system

In Switzerland, the Professional Education and Training (PET)[1] system makes a substantial contribution to workforce skills. Of those graduating from tertiary programmes in 2009, nearly 40% were from the PET sector (BFS, 2010a), and 20% of the Swiss labour force held a PET degree in 2009 (at tertiary B level) equalling the proportion of tertiary A degree holders (BFS, 2009).[2] Different pathways lead to PET qualifications. Although there are some exceptions – such as healthcare in the professional colleges, and the police force and fire service for examinations, the PET system is primarily designed for those already working in a profession who want a higher level of qualification rather than to facilitate initial entry to a profession.

The PET sector consists of two main sub-sectors. First, there are professional college (*höhere Fachschulen*) programmes. Second, national PET examinations include the Federal Diploma Examination (*Eidgenössische Berufsprüfung*) and the Advanced Federal Diploma Examination (*höhere Fachprüfung*).[3] Advanced Federal Diplomas represent a higher professional level than Federal Diplomas, but in many professions only one kind of PET Diploma can be obtained (see Figure 1.1).

Figure 1.1 The Swiss education system



Source: OPET (Federal Office for Professional Education and Technology) (2012), *Facts and Figures. Vocational and Professional Education and Training in Switzerland.*

In 2011, there were 52 professional college degree programmes covering diverse professional areas such as engineering, healthcare, and arts and design. Full-time professional college degree programmes last at least two years and part-time programmes at least three (SKBF, 2011). In full-time programmes about one fifth of the study time is devoted to workplace traineeships, while part-time students normally work in a job closely related to their study programme (and indeed are often required to do so). About half of all professional college degrees issued in 2009 were obtained following completion of part-time studies; most of the degrees earned in full-time education were issued in healthcare (in the other professions less than one third of the degrees were earned through full-time studies) (BFS, 2010b).

Of the 400 national PET examinations available in 2011, 240 lead to a Federal PET Diploma, while 160 lead to an Advanced Federal PET

Diploma. The number and content of examinations change regularly as labour market organisations adjust the examinations to changing needs; typically 60-100 examination rules are under revision at any point in time. Students typically take part in a preparatory course (*vorbereitender Kurs*) for a national PET examination even though participation is in principle not mandatory and degrees are awarded exclusively on the basis of exam performance. Preparatory courses are much more diverse than professional college degree courses and they are largely unregulated. Few statistics encompass the whole sector, but in the preparatory courses registered by BFS, only 7% of students followed a full-time course (BFS, 2010b). Preparatory courses can take from a few months to two to three years. Course format reflects student demand, it often means weekend or evening classes and distance learning.

The Swiss Advanced Federal PET Examination reflects the classical progression from apprenticeship to *Meister* level, enabling the examinees to show their capacity to carry out their profession independently, run their own business, and train apprentices. But the scope of this examination type has now widened to include other non-technical professions, in the commercial, manufacturing, agricultural, and service related sectors. The examinations fulfil the need to certify specific professional competencies needed for instance in legally regulated areas to act as an entry point to the service sector and to be used as a human resources development tool.

The governance of the PET system rests on a partnership between the federal and cantonal governments and labour market organisations which include employer organisations, professional associations, and trade unions. The federal government, through the Federal Office for Professional Education and Technology, OPET (*Bundesamt für Berufsbildung und Technologie, BBT*) provides strategic planning and development and ensures quality. It approves rules for professional examinations and recognises professional college degree programmes by approving the core curricula. The federal certification process ensures that there is no overlap between examinations and that the stakeholders reach a consensus regarding course content without extensive government intervention. The cantons are responsible for supervising professional college degree programmes and in some (infrequent) cases they also supervise preparatory courses.[4] A new law in preparation regarding continuing education (*Weiterbildungsgesetz des Bundes*, WeBiG.) is expected to enhance the cantons' responsibilities.

Switzerland's PET programmes are funded from a mix of public and private sources. The federal government and the cantons cover 70% of professional colleges' costs on average (mainly in support of healthcare and other professions where the state is the main employer) and, according to a 2006 estimate, 15-18% of the direct costs of examinations and preparatory

courses (PwC, 2009). Other costs fall on students and employers; three quarters of PET students receive employer support for their studies (BASS, 2009). Labour market organisations provide some limited support through grants and training providers. Cantons receive a lump sum from the federal government based on the number of VET (but not PET) students in each canton which they are free to divide between VET and PET. The funding of inter-cantonal mobility of PET students is currently based on a very complex network of bilateral agreements between cantons mainly covering professional colleges and only rarely preparatory courses. A new inter-cantonal concordat is planned to replace the current system.

While the focus of the review is on the PET (tertiary B) system, the academic tertiary A system is an important part of the context. The Swiss tertiary A sector includes universities and Federal Institutes of Technology (referred to as universities throughout this report) on the one hand and Universities of Applied Science (*Fachhochschulen*) (UASs) on the other. The UAS sector was originally created by transforming some professional colleges and their training programmes and reclassifying them as tertiary A education. The UAS sector has grown fast, reflecting a combination of real growth, and some element of reclassification. There are guidelines for UASs on admitting PET graduates to their bachelors' degree programmes and on transferring credits from PET to UASs (*Konferenz der Fachhochschulen der Schweiz*, 2006). Admittance of PET graduates to universities is regulated by the university departments themselves.

The system in international context

The professional examinations

While the professional examinations have some uniquely Swiss characteristics, they can be compared with examination systems in some other countries. Annex A compares the Swiss advanced federal PET examination with the somewhat similar arrangements in Germany and Austria. While both in Germany and in Austria the examinations of master craftsman exist, in the non-technical sector comparable qualifications are not as visible as in Switzerland. Within the Swiss VET system, all examinees of the Advanced Federal PET Examination receive the uniform designation "with Advanced Federal PET Diploma" (*mit eidgenoessischem Diplom*). In Germany and Austria however, candidates in the regulated non-crafts sectors may pass a German "advanced vocational examination" (*Fortbildungsprüfung*) or the Austrian "qualifying examination" (*Befähigungsprüfung*) but in neither case would they be awarded a nationally recognised title.

In the United States there are a large number of industry organised postsecondary vocational qualifications but unlike Switzerland, they are not subject to government regulation, and indeed they are not formally recorded statistically as part of the education and training system.[5] Annex B compares three examples of Swiss Advanced Federal PET Examinations with equivalent US vocational qualifications. While in Switzerland the qualification of a Financial Expert with Advanced Federal PET Diploma remains vocational and non-academic, in the US, in order to become a Certified Financial Planner (CFP) the examinee must obtain a bachelor's degree either before or after the certifying examination. In both Switzerland and the US, working organisations are responsible for the examinations for master plumbers and electricians within a national framework. While in Switzerland there is only one organising body for each profession, in the US there are numerous non-state organisations in charge of vocational licensing and certifying examinations.

The professional colleges

Professional colleges also find parallels in other countries. The table in Annex D compares the Swiss professional colleges with a selected set of OECD countries based on material available online in English, French, and German (vocationally oriented tertiary A institutions and programmes such as UASs are excluded). Switzerland's professional college sector covers the whole spectrum of economic activities while many parallel arrangements serve only some economic sectors (excluding, for example, mining and education in Germany and Denmark). Courses shorter than two years are rare in Switzerland, but common for example in the USA). Entry conditions to professional colleges are also relatively stringent as they not only stipulate secondary vocational qualifications, but also work experience; similar arrangements are found in Austria, Germany, but relatively few other countries. The entry into academic higher education of professional college graduates is mainly left to the discretion of institutions themselves which is different from the OECD countries analysed here.

Key international indicators

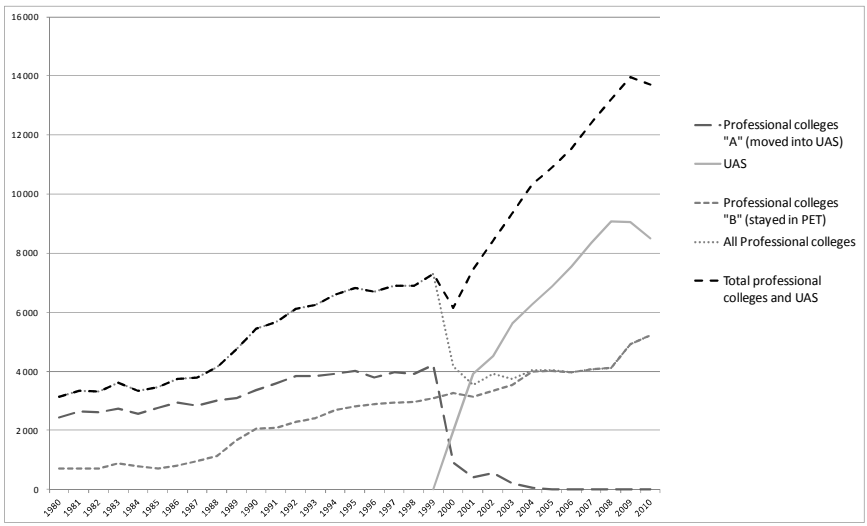
Comparisons of a statistical indicator for any one country with the OECD average are useful, but must always be interpreted with caution. Few indicators are unequivocally positive in one direction, and, there can be no presumption that convergence with the average is desirable.

Indicators of education and training

In Switzerland tertiary graduation rates (a measure of the proportion of a population cohort gaining tertiary qualifications) have been rising. Tertiary B graduation rates reached 19% in 2008 – more than double the OECD average – and up from 14% in 2000 (OECD, 2010a) reflecting the much greater importance of this sector in Switzerland than in many other countries. But at the same time the tertiary A graduation rate more than doubled from 12% in 2000 to 32% in 2008 – still below but approaching the OECD average of 38%.

In fact, much, but not all of this growth reflects the reclassification and transformation of some professional colleges to fit Bologna requirements (BFS, 2011a). The UAS sector continues to grow rapidly compared to the modest increase in student numbers at universities. After separating out the professional colleges which were moved into tertiary A and the healthcare professions whose classification is problematic (BFS, 2011a), it is apparent that the UAS sector has experienced a sharp expansion over and above the previous growth trend in professional colleges which formed the basis of UAS. In addition, professional colleges which remained in the vocational sector experienced little growth since the introduction of UAS (see Figure 1.2).

Figure 1.2 Number of graduates per year in professional colleges and UAS, 1980-2010, without healthcare professions

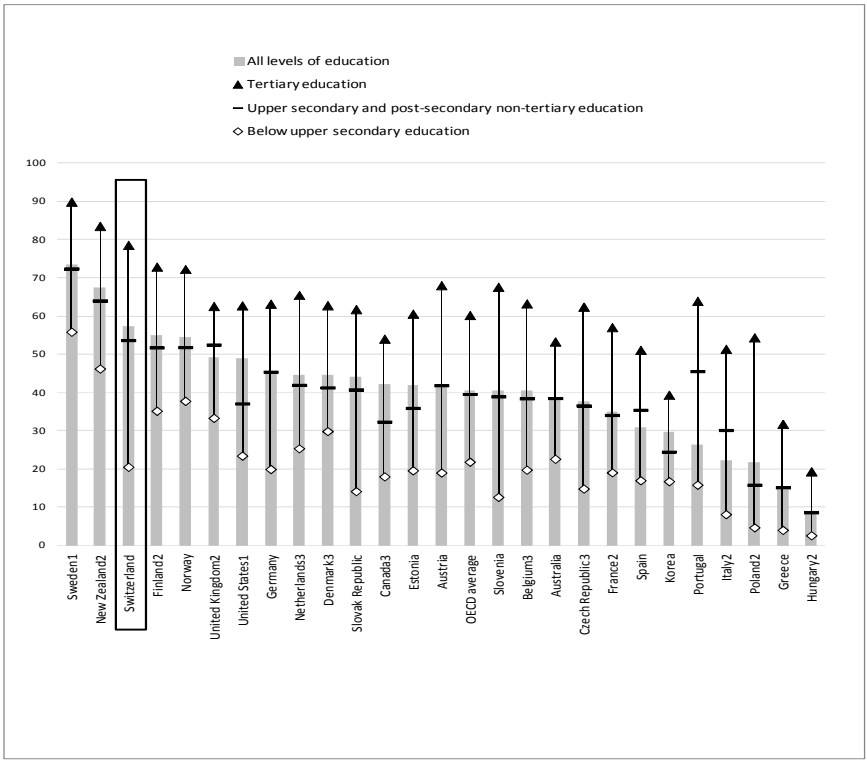


Source: BFS (*Bundesamt für Statistik*) (2011b), *Abschlüsse der höheren Berufsbildung: eine statistische Bestandesaufnahme*, BFS, Neuchâtel.

Switzerland is characterised by a high level of continued adult participation in education and training – at least for those who have completed upper secondary education. More than half of men and women aged 25-64 reported taking part in some formal or non-formal education in the previous year (see Figure 1.3). Patterns of participation in formal and non-formal training in Switzerland resemble international patterns as employed persons, particularly those working full-time and those with higher level qualifications are much more likely to participate.

Figure 1.3 Adults' participation in formal and/or non-formal education, by educational attainment

Participation rate of the 25-64-year-old population, 2007



Notes: 1. reference year 2005; 2. reference year 2006; 3. reference year 2008. Countries are ranked in descending order of participation in formal and/or non-formal education, for all levels of education.

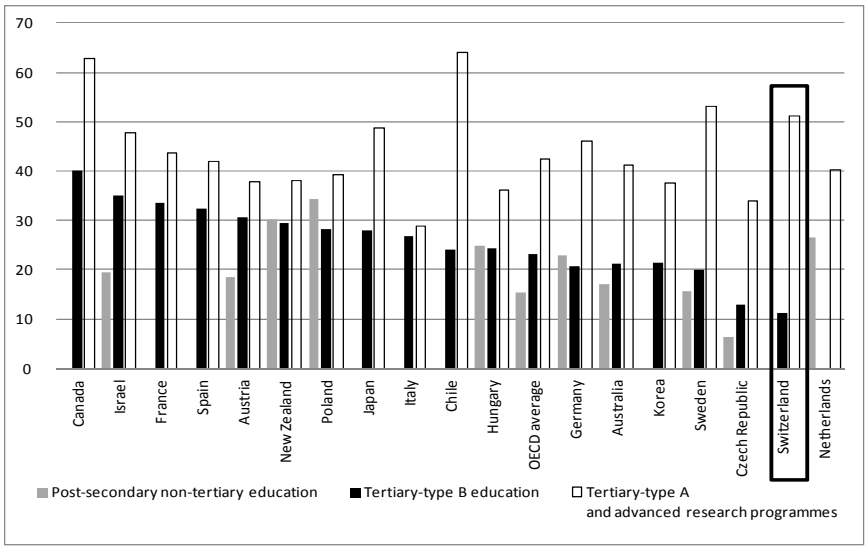
Source: OECD (2010a), *Education at a Glance 2010*: *OECD Indicators*, Table A5.1b, OECD Publishing. doi:. *http://dx.doi.org/10.1787/eag-2010 en*, (*www.oecd.org/edu/eag2010*).

Men with PET (tertiary B) qualifications in Switzerland earn about one quarter more than average in Switzerland (similarly to tertiary B qualified men in other countries), while women with PET qualifications do rather better. Despite the rapidly growing supply of tertiary graduates, the earnings gains from tertiary education overall remain substantial, particularly for women (see OECD, 2010a, Table A.7.2b) although not as large as in some countries – so there is little evidence of any over-supply of tertiary graduates (academic and vocational combined). Specific evidence on rates of return of PET shows that returns to PET are high and are between returns to UAS and university education (Wolter and Weber, 2005). Overall returns to professional college degrees are significantly higher than returns to professional examinations while returns to a year of education are of similar magnitude (professional college degree programmes typically take much longer than preparation to professional exams (Cattaneo, 2011).

Public expenditure on educational institutions per student is quite high in tertiary A education by international standards in Switzerland (at around 50% of GDP per capita – compared with an OECD average of around 40%), but it is the lowest among OECD countries in the PET system (in 2008 at 11% compared with an OECD average of 23%) (see Figure 1.4).

Figure 1.4 Annual expenditure by educational institutions per student for all services relative to GDP per capita (2008)

By level of education, based on full-time equivalents



Source: OECD (2011a), *Education at a Glance 2011: OECD Indicators*, OECD Publishing. doi: http://dx.doi: 10.1787/eag-2011-en

Labour market indicators

Most indicators suggest that overall the transition from school to work in Switzerland is relatively smooth, with a comparatively small proportion of the 20 – 24 year old cohort not in education or unemployed. At the same time there are some indications of skills mismatches for young tertiary educated males in Switzerland, with 27% of 25-29 year olds not in education but with tertiary qualifications working at skill levels 1 or 2, more than the OECD average of 23% (OECD, 2011a).

The Swiss labour market is relatively deregulated, with relatively weak employment protection for workers. Employment protection is important for training policy because it may represent a barrier to the recruitment for untrained workers – since it reduces the employer's willingness to recruit untrained workers and train them on the job.

Table 1.1 The Swiss labour market

	Unit	2000	2009	2010	2010 OECD Total
Unemployment rate	% of labour force	2.7	4.2	4.4	8.5
Youth unemployment rate	% of youth labour force (15-24)	4.9	8.4	7.2	16.7
Long-term unemployment (12 months and over)	% of total unemployment	29	30.1	34.3	32.4
Employment rate of women	% of female population (15-64)	69.4	73.6	72.3	56.7
Part-time employment	% of total employment	24.4	26.5	26.3	16.6
Growth of real GDP	% change from previous year	3.6	-1.9	2.6	2.9

Source: OECD (2011b), "OECD Economic Outlook No. 89", *OECD Economic Outlook: Statistics and Projections* (database). doi: http://dx.doi.org/10.1787/data-00539-en

Previous OECD recommendations

The 2009 OECD economic survey of Switzerland argued that tertiary participation rates could usefully be increased, in view of labour market demand (OECD, 2009). It also argued, that on grounds of both efficiency and equity, tuition fees in tertiary academic education should be raised, and government-sponsored loans to students in tertiary education (including vocational tertiary) should be made widely available, coupled with income-contingent repayments. In addition to standard arguments for this means of funding tertiary education, the survey also points out that in Switzerland higher fees would also reduce the potential distortions arising from reliance on cantonal support since cantons may be unwilling to support tertiary studies where the benefits are national rather than local (OECD, 2011c, 2009). The recent OECD report *Economic Policy Reforms 2011: Going for Growth* (OECD, 2011d) reiterated the recommendation, arguing that limited loans for tertiary studies, especially for the parts of the PET system where high study fees limit access. The same report proposed reform of the Swiss tax system to improve work incentives and labour force participation among women.

The *Learning for Jobs* OECD review of vocational education and training in Switzerland (Hoeckel, Field and Grubb, 2009) commented on the many strengths of the Swiss VET/PET system, including the range of offerings in the PET system, its quality, and responsiveness to labour market needs. At the same time it noted some emerging challenges. These include competition between vocational and "academic" tertiary education in universities and UASs, perhaps intensified by demographic decline in the numbers of young people. Multinational companies with limited experience of the Swiss VET/PET system may add to the threat. The OECD (2008) review of systemic innovation in the Swiss VET system reported on three innovations – VET case management, the reform of basic commercial training and the "Leading Houses" system of research on VET.

The OECD's 2003 review of tertiary education in Switzerland (OECD, 2003), among other matters, recommended:

- Greater permeability in access routes and qualifications. First-year studies in the universities should be made more flexible, providing support for students with vocational baccalaureates.
- Upgrading and integration of teacher training and health education (among other parts of higher vocational training) in the universities of applied sciences.

- Boosting information and guidance for prospective tertiary education students and their parents.

The latest OECD economic forecast for Switzerland predicts continued economic growth in 2012, but it is expected to slow down due to the strong franc and dampening global demand. As a result a slight increase in unemployment is predicted (OECD, 2011e).

Appreciation of the Swiss approach to postsecondary VET – key strengths

Employers and professional associations are engaged with and actively contribute to PET. The system is highly responsive to labour market needs

Across OECD countries

Evidence shows that the engagement of social partners – both employers, unions, and professional associations is necessary to ensure that the organisation and the content of vocational programs meets the needs of employers, the wider economy and students (OECD, 2010b). Social partner engagement is also crucial both for national level policy development and to ensure adequate policy implementation. However, in many countries it is hard to engage employers, unions, and professional associations in the vocational education and training system. This is particularly true in countries without strong apprenticeship traditions.

In Switzerland

Labour market actors are remarkably well integrated into the PET system. The qualifications offered are largely determined by labour market associations, with employer and professional organisations largely defining the content of professional examinations as well as professional college degree programmes. Content is determined by bringing together different employers in order to build consensus on a professional profile (OPET, 2007). Most employers also actively support their employees during their PET studies financially, non-financially, or both (BASS, 2009). Some employer associations provide grants to PET students in need while others run professional colleges and manage providers of preparatory courses in order to assure themselves of high quality provision.

The responsiveness of the Swiss PET to labour market needs depends, among other factors, on the way in which many working students pursue their studies with the full support of existing employers. Most PET students

have extensive work experience and work alongside a linked programme of PET study. The professional profiles which underpin examinations are regularly reviewed in order to ensure that they remain relevant. The review typically takes between 6 to 12 months, a relatively swift and unbureaucratic process.

Policy development has a strong institutional leadership in OPET

Across OECD countries

Across countries VET policy development offers particular challenges because of the wide range of different stakeholders involved, and this is further complicated in federal and decentralised countries (such as Switzerland) where much responsibility for VET is held locally or regionally. (For a discussion of how this issue is tackled in Australia, see Hoeckel *et al.,* 2008.) Some degree of consensus among the different stakeholders is important, but needs to be balanced by effective leadership to ensure that consensus does not become a formula for inertia, with a multiplicity of stakeholders each holding an effective veto on necessary reforms.

In Switzerland

In contrast to other fields of education in Switzerland, PET is mainly steered on the federal level. The federal body responsible, OPET carefully manages a partnership with labour market organisations and the relationship with training providers, engages in constant dialogue with stakeholders and provides strategic leadership. Its latest effort in facilitating peer learning among professional examiners and managers as well as among professional colleges are good examples of initiating systemic level improvement without excessive state intervention. Cantons, while preserving their autonomy, effectively complement OPET's work, for example, by carrying out regular inspection of PET providers.

The system offers a flexible and effective response to diverse student requirements

Across OECD countries

Responding to changing student demand has been at the centre of attention in a range of OECD countries (Jenkins, 2011). Working adult students require a different approach when compared with students at the initial stages of education and training. This has led to a range of

innovations across OECD countries such as developing courses relying heavily on online and self-directed learning.

In Switzerland

Many PET students, particularly those preparing for federal diplomas, work full-time alongside their studies and often have family and other private obligations (BFS, 2011b; BASS, 2009). Roughly one third of PET students study in a canton different from their home canton (OPET, 2008) travelling to their place of study.[6] Thus, students have diverse needs in terms of course format and study methods such as evening and weekend courses, distance learning, and block seminars. As far as the OECD review team could discern from their visit, PET provision adjusts well to these needs. Pedagogical practices and study modes are diverse, including traditional school-based pedagogy, distance learning and personal consultation. Students interviewed were supportive of these arrangements and were generally convinced that potential students would be able to find the type of provision best suited to their needs. While interruptions of studies are frequent due to the combined burden of studies, work, and private life, return to studies is facilitated by the modular structure of PET studies available in most programmes.

Work-based learning is well integrated into PET programmes

Across OECD countries

Good quality work-based learning is a very important part of effective vocational programmes, and in some countries it is inadequate (OECD, 2010b). It provides a strong learning environment, it can improve transition from school to work by allowing employers and potential employees to get to know each other, it contributes to the output of the training firm, and it links training provision to a direct expression of employer needs. However, to reap these benefits, the placement has to be of high quality and integrated into the VET curriculum. In the absence of quality control and links between the curriculum and the workplace, workplace training is likely to degenerate into cheap labour, or involve very narrow and firm-specific skills (OECD, 2010b).

In Switzerland

The work-based component of PET studies is realised either through an internship or a regular job. Internships are typically for full-time students, mainly in professional colleges, where they form an integral part of the programme. Part-time students typically continue to work in regular jobs

alongside their PET studies but in this case, the student's work has to be related to PET studies. Students commonly have to try out techniques and apply concepts learned in the study programme at the workplace. Subsequently, they report back on their experiences which are discussed at the study programme to improve and solidify the learning experience. These ways of integrating work-based learning into PET studies are effective in the view of most stakeholders.

The professional exams effectively link upskilling to recognition of prior learning

Across OECD countries

Recognition of prior learning is a key component in many OECD countries' system for upskilling their labour force, making competences (often acquired informally) more transparent to employers, students, and education institutions (OECD, 2007). Despite these theoretical efficiencies, professional educators are sometimes reluctant to accept that the competences they teach can be acquired informally, education institutions sometimes have inadequate financial incentives to recognise prior learning, while employers may not always see advantage in making skills of their own employees more visible to competing firms.

In Switzerland

Since the professional exams are competency based and closely related to actual workplace practice, skills learnt on the job can be granted recognition through the examination. Many students at preparatory courses only attend some of the course modules depending on their prior experience and knowledge. The combination of flexible course provision and competency-based exams allows prior learning to be recognised, augmented by targeted provision of additional skills, according to the needs of the individual student.

The PET system is well articulated with upper secondary VET

Across OECD countries

Upper secondary vocational tracks in some countries can be dead ends, with no or highly constricted opportunities for further upskilling – both a waste of potential for those held back and a threat to the status of the entire vocational track, since some able students will not enter upper secondary VET if by doing so they lock themselves out of further education opportunities. When students choose among different vocational and

academic tracks future upskilling opportunities influence their decision (Ordovensky, 1995). So a clear route of upward mobility is essential to a high status VET track.

In Switzerland

In Switzerland, progression from upper secondary VET to PET is a clear and well-regulated pathway, allowing graduate apprentices both to deepen their professional knowledge and to acquire general entrepreneurship and leadership skills, supporting promotion into management positions or independent professional roles. Such good articulation helps to maintain the high status of the vocational track as PET graduates can often compete for the same jobs as graduates of UAS or universities and often come to fill senior management positions.

Teachers and trainers in professional colleges are well prepared

Across OECD countries

As in general education, the quality of the teaching and training profession is the most critical element to effective learning in vocational programmes (OECD, 2010b). A number of OECD countries are facing challenges in recruiting and retaining high quality vocational teachers who are not only adequately prepared pedagogically, but are also experienced and up-to-date in their professional field. This challenge is often met by relying on part-time working arrangements and directly recruiting practitioners from industry.

In Switzerland

As in upper secondary VET, teachers and trainers in professional colleges are well prepared both in their profession and pedagogically (Hoeckel, Field and Grubb, 2009). The Swiss Federal Institute for Vocational Education and Training, SFIVET (*Eidgenössisches Hochschulinstitut für Berufsbildung*, EHB) provides basic and continuing training to examiners and college teachers. They are required to have a professional college degree, or a higher education degree or an equivalent qualification in their chosen field and both full and part-time teachers are required to pursue a vocational pedagogy programme (OPET, 2011). The supply of well-trained teachers and trainers is underpinned by the high prestige of teaching in a professional college and flexible arrangements to blend work in the profession with teaching. Such part-time teaching arrangements not only allow teachers to keep their job in industry, but also ensures that professional colleges' curricula reflect up-to-date industry

requirements (individual teachers typically develop their own curricula within the framework of the certified curriculum of their college).

International recognition can build on the success of some high profile areas

Across OECD countries

Countries with considerable postsecondary VET systems, especially smaller countries, face the challenge of international recognition for their programmes. This is mainly due to the fact that compared to internationally well recognised tertiary A programmes leading to bachelors and masters qualifications, postsecondary VET programmes are often less well known and structured in country-specific ways. Hence, international companies find it more difficult to value postsecondary VET degrees and graduates of postsecondary VET may find it hard to achieve recognition in countries other than their own.

In Switzerland

Some individual PET programmes have already built international reputations - the professional colleges in hotel and tourism management are one obvious example. Some Swiss professional colleges offer degree programmes jointly with a foreign partner, requiring students to spend time in both institutions (see for example IST, 2011). While these examples are unique in several respects, they signal that it is possible to achieve a high international reputation within the PET system. This can be successfully advanced by opening up to foreign students, companies operating abroad and international collaborations.

Challenges

Despite all the manifest strengths of the Swiss PET system, there remain, inevitably, some significant challenges. These challenges, (set out below in summary), and what might be done to address them forms the subject of the next chapter.

- There are some potential financial and non-financial barriers to access to PET, and government financial support may be biased towards academic tertiary education.
- In contrast to most other sectors of education and training, inter-cantonal arrangements for funding PET are haphazard, leading to confusion, unfairness and inefficiency.

- Information on the quality and costs of PET courses is inadequate, and there are quality weaknesses in some areas.
- Globalisation is putting a number of different pressures on the Swiss PET system, intensifying the need for international recognition of Swiss PET qualifications and demanding new higher level and sometimes globally defined competencies as part of many jobs.
- Numeracy and literacy are of increasing importance in professional occupations, and the PET system, alongside other parts of the Swiss education system need to address them more effectively.

Notes

1. The specific Swiss terms used are *Höhere Berufsbildung* in German, *Formation Professionnelle Supérieure* in French, and *Formazione Professionale Superiore* in Italian.
2. The 3% of the Swiss labour force held in 2009 both tertiary A and B qualifications hence this group is counted both as tertiary A and B diploma holder (BFS, 2009).
3. These lead to two different corresponding degrees: the Federal PET Diploma (*eidgenössischer Fachausweis*) and the Advanced Federal PET Diploma (*eidgenössisches Diplom*).
4. Cantonal supervision of preparatory courses takes place when cantons finance some of the training costs.
5. Although recently the National Center for Education Statistics has launched an initiative to remedy this.
6. In addition, students may also travel to their city of study within their canton of residence.

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Chapter 2

Ensuring finance is no barrier to professional education and training

Financial barriers and disincentives could be limiting access to professional education and training (PET). The up-front monetary and non-monetary costs of PET programmes could present a barrier to some potential students who would otherwise benefit. Following previous OECD recommendations, the report recommends a pilot to explore whether fuller government loans and grants would help to remove potential access barriers to PET.

Challenge

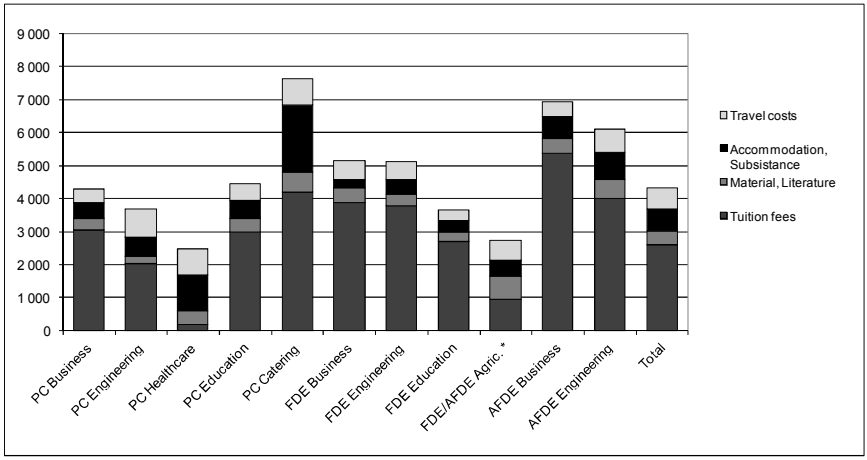
In Switzerland, financial barriers and disincentives could be preventing access to PET. First, the up-front monetary and non-monetary costs of PET programmes could present a barrier to some potential students who would otherwise benefit. Second, PET is more expensive in general than academic tertiary education, which receives higher levels of public subsidy. This could hamper PET from competing for future students.

The high up-front costs and time requirements of PET present an access barrier

The average direct cost of PET programmes was estimated to be CHF 4 300 per semester in 2008, not including exam costs[1] for those taking professional exams (BASS, 2009).[2] Tuition fees represent just over half the cost, with textbooks, travel, and subsistence and accommodation making up the remainder (see Figure 2.1). As many courses take place in a city different than the residence of the student, travelling and accommodation costs are relatively high. Average cost figures mask large variations. In professional colleges for healthcare professions, for example, there is typically no tuition fee and students receive a monthly remuneration which was as much as CHF 1 200-1 500 per month in 2010. At the other end of the spectrum, in professional colleges for catering-hoteling (available only as full-time studies) and for the advanced federal diploma in business the total cost per semester ranged between CHF 7-8000 in 2008 with a tuition fee of up to CHF 4-5000 per semester. These estimates come from the only study which reports on the financial burden of PET students in professional colleges as well as preparatory courses (BASS, 2009). The median monthly gross salary of employees with 5-9 years of experience was CHF 5 900 in 2008 (BFS, 2011c), so the most expensive hoteling and business training costs amounted to about 13-15% of the average yearly net salary (OECD, 2009).[3]

Employers and government bear some of these costs alongside students.[4] In 2008 only 23% of PET students received no financial or other help from their employers (BASS, 2009). Employers often contribute directly towards tuition fees and exam costs or grant paid leave for their employees to attend courses. Some cantons offer grants and loans for PET students. Course fees may be subtracted from taxable income, and the maximum amount of deduction is likely to be increased soon to CHF 12 000 (Ständerat, 2011).

Figure 2.1 Average costs of study for students in PET, per semester, CHF, 2008 (without exam costs)



Source: BASS (*Büro für Arbeits- und Sozialpolitische Studien*) (2009), *Finanzflüsse in der höheren Berufsbildung – Eine Analyse aus der Sicht der Studierenden*, OPET, Bern.

Notes: * 10-29 observations (un-weighted data).

PC = Professional College; FDE = Federal Diploma Examination; AFDE = Advanced Federal Diploma Examination.

Several persons interviewed during the OECD's visit said that the costs of PET could prevent some employees from participating, but numbers so deterred are hard to estimate given the absence of any survey data on such individuals.[5]

The time and effort spent on studying and attending courses could also represent a barrier, especially for those in part-time arrangements.[6] On average, part-time students spend 19 hours a week on their PET studies, including instruction time, preparation, homework and exams (BASS, 2009) on top of regular working hours of about 35 hours per week on average. PET students therefore often have to work late hours and at weekends. The variability of workload across professions and between professional colleges and preparatory courses is large. For example, in professional colleges for technical professions the weekly educational workload exceeds 25 hours, while in preparatory courses in business it is only 15 hours. The demanding workload of PET is particularly challenging for those like lone parents with heavy family commitments and for those required to work long hours. Poorly paid employees, with unsupportive employers may face particular challenges. Male workers and Swiss nationals are more likely to hold a PET

degree all else being equal (Cattaneo, 2011). The burdens are somewhat eased by flexible forms of provision with a wide range of evening and weekend courses available, minimising disruption to work and home life, while the modular character of most PET courses allows for interruptions without losing credit for what has already been completed.

Even if the financial costs and other burdens do not prevent entry to PET, they could cause drop-out. In academic years 2006 and 2007, the drop-out rate from PET courses was 11% (11 students out of 100 who started the first semester did not reach the final semester) while the failure rate at the final examinations was 13% (13 students out of 100 who signed up for the final exam failed the exam) (BASS, 2009). This implies that overall, 26% of the students who started PET in 2006 and 2007 did not obtain a degree by the end of their regular education path [0.74 = (1-0.11) *(1-0.04)*(1-0.13)].[7] While the drop-out rate is higher for professional colleges than preparatory courses, the failure rate at the final exam is higher for professional exams. For reference, the completion rate in Swiss tertiary A education was 72% in 2008 – implying a relatively similar or slightly higher level of drop-out than in PET courses (OECD, 2010a). Both students and training providers cite the time and financial demands as major reasons for drop-out and course interruption; personal reasons, too high professional requirements, and missing competences are also factors (BASS, 2009). It is extremely hard to compare drop-out rates internationally, but data compiled by Jenkins (2011) suggest that drop-out in the Swiss PET system appears to be relatively high in comparison with other selective systems.[8]

The high returns on investment in PET (Wolter and Weber, 2005), while underlining the labour market value of PET qualifications, could also signal an inadequate supply of PET skills. (Although it is worth noting that the same studies showed high returns from university qualifications – so the factors involved could go wider than just PET). Several interviewees pointed to acute shortages of PET graduates in fields such as information technology (which might be partially due to high growth over the last decade). Enterprise surveys also suggest difficulties in hiring of tertiary, particularly tertiary vocational graduates, in financial intermediation, transport and communication as well as information technology (Fuentes, 2011). Some of these skills shortages are already visible at the level of upper secondary VET qualifications, with knock-on effects on the PET level labour market.

PET receives comparatively less public funding than academic tertiary education

Overall, there is a sizeable difference in public spending between vocational and academic tertiary education (OECD, 2009; Hoeckel, Field and Grubb, 2009) (Table 2.1). In professional colleges the proportion of full-time students is relatively high (36%) and concentrated in a few well-supported professions such as health care (BFS, 2011a); but the majority of students study part-time and receive only a small amount of public funding.

Table 2.1 Proportion of federal, cantonal, and private funding of tertiary education, %, 2006-2009

	PET[1]			UAS[2]			Universities[2]		
	Professional colleges	Federal PET Diploma	Advanced Federal PET Diploma						
	2006			2009	2008	2007	2009	2008	2007
Federal government	70	18	15	19	19	18	46	45	45
Cantons				61	61	62	38	39	40
Private	30	82	85	20	20	20	16	16	15

Note: 1. *Source*: PwC (PricewaterhouseCoopers AG) (2009), *Analyse der Finanzflüsse in der höheren Berufsbildung*, OPET, Bern.

Note: 2. *Source:* BFS (*Bundesamt für Statistik*) (2011c), *Tertiärstufe: Hochschulen. Detaillierte Daten. Finanzen*, BFS, Neuchâtel, www.bfs.admin.ch/bfs/portal/de/index/themen/15/06/data.html#Finanzen , accessed July 2011.

Given higher subsidies, fees in academic tertiary education are lower than in PET. In 2010/2011, Swiss universities charged between CHF 1 000 and CHF 2 000 per year (un-weighted average: CHF 1 600) for Swiss nationals and between CHF 1 000 and CHF 2 300 per year (un-weighted average: CHF 2 000) for foreign students (*Rektorenkonferenz der Schweizer Universitäten*, 2011).[9] Fees are somewhat higher in UAS ranging between CHF 1 000 and CHF 2 400 per year for domestic students (*Rektorkonferenz der Fachhochschulen der Schweiz*, 2011).

PET students are eligible for the same grants and loans as their counterparts in academic tertiary education. Only 3.3% of PET students received cantonal financial support (grants, loans) in 2008 (BASS, 2009). 5.5% of all education grants went to students in PET and 48.8% to students in academic tertiary education in 2009 (BFS, 2010). There are large

differences across cantons regarding grants as well as loans (for details see BFS, 2011d). Less than 2% of students in UAS and universities receive government-sponsored loans while overall 84% of tertiary students receive no financial support from the government (OECD, 2009).

These funding differences between PET and academic tertiary education have been extensively debated in Switzerland (OPET, 2011a). They have historical roots, but they may also conflict with equity. Although PET students are typically employed and therefore more able to cover up-front costs than UAS and university students who often study full time; the lifetime incomes of PET graduates are typically lower than those of university and UAS graduates providing no clear reason for higher proportion of private funding in PET (BFS, 2011e). They also bring high fiscal returns to the public budget (Wolter and Weber, 2005).

Funding differences could in principle inhibit PET from successfully competing for future students

PET students, in most cases, require extensive work experience in the given field, UAS students typically need to have a vocational baccalaureate, while university students have to pass the academic baccalaureate before gaining entry (OPET, 2011a; Hoeckel, Field and Grubb, 2009). On the face of it PET does not therefore immediately compete with UASs and universities for the same group of students, outside some business professions such as Certificate of Advanced Studies (CAS) in General Management, Diploma of Advanced Studies (DAS) in Business Administration, or Master of Advanced Studies (MAS) in Human Capital Management. But, looked at more strategically over the long term, PET might compete with the UAS and university sector. School students make their initial choice of different tracks partly with regard to future opportunities and their comparative costs and benefits (Ordovensky, 1995). The higher costs of PET may bias these decisions undesirably. Students might face a choice especially between professional colleges and UASs, hence there might be some form of competition between the two sectors as indicated by Chapter 1: prior to the establishment of the UAS sector, the professional college sector was expanding, but since the creation of the UAS sector the professional college sector has been stable in size, while UAS numbers continue to increase.

Recommendation

On a pilot basis, explore whether a loan and grant scheme would remove an access barrier to participation in PET.

Supporting arguments

There are four arguments in support of this recommendation. First, income-contingent loans and grant schemes have produced desirable outcomes in a range of countries. Second, more even tuition costs across the tertiary sector would allow for more level competition between PET, UASs and universities as well as more equitable treatment of their students. Third, it should also increase efficiency in tertiary education. Fourth, given some potential downside risks, any loan and grant scheme could and should be initially piloted in a small number of cantons.

Income-contingent loans and grants have been successfully introduced in a number of countries

According to international evidence, government supported loans covering both fees and maintenance help those who wish to enter tertiary education. In particular, they address the efficiency problem that some students who would benefit substantially from tertiary education cannot afford the up-front costs. As repayments are contingent on future income, more risk averse students would find the scheme attractive (OECD, 2009; OECD, 2008, Chapter 4). Such risk-averse students are precisely those who, in the absence of such loans, might be reluctant to take the risk of a large investment in training with uncertain returns. Grants would cater for those with very low incomes and show high aptitude. Income-contingent loans and grants, potentially financed from tuition fees, could offset any potential negative enrolment impact of fees in tertiary education on lower socio-economic status students (OECD, 2008, Chapter 4).

Following an initial investment in income-contingent loans, depending on the design of the scheme, only modest costs would fall on the government. The system of loans and grants would be efficient as it would be aimed at those who face an entry barrier, others would be less likely to apply for a loan or qualify for a grant. By removing an access barrier which is likely to bear most heavily on the most disadvantaged would also contribute to improved social mobility and a more equitable society (OECD, 2008, Chapter 4).

More even tuition fees across the whole tertiary sector would allow for fairer competition

Current funding differences between PET and academic tertiary education bias choices towards academic pathways where there is short or long run competition between academic and vocational courses.[10] This is particularly true when comparing full-time courses in vocational and

academic tertiary education, while this argument is more nuanced when comparing part-time with full-time courses of different length.

The current differences could be removed either by increasing public funding for PET or reducing public funding for academic tertiary education, for example by increasing fees. The former would be undesirable due to its high public expenditure costs and the need to preserve the leading role of labour market organisations in the PET system. The latter option would reduce public expenditure by substituting it with private financing. A consistent funding arrangement across the whole tertiary sector should reflect the public utility and private benefits of tertiary programmes rather than the disposable financial resources of students (OECD, 2008, Chapter 4).

The proposed reform package would increase efficiency in the whole tertiary sector

In PET, competition across providers is limited not only by the high cost of accommodation and travel but also by an inconsistent system of inter-cantonal financing. A consistent Switzerland-wide support scheme to pay fees and cover education related costs, would help students to make efficient choices – opting for a more suitable or higher quality course away from home if that would be a better long term option. Efficient choice would also be assisted by consistent inter-cantonal arrangements, discussed below.

Any loan and grant scheme should initially be piloted

Precisely how these theoretical benefits would emerge in practice requires further investigation, and might be set against the costs and other disadvantages of a loan and grant scheme. A small number of cantons implement a proposed new policy of loans and grants. Their experience before and after the date of introduction of the experiment could be compared with the experience of other control cantons before and after the date of introduction. This would allow the costs and benefits of the scheme to be assessed, including the effect on participation and completion of PET programmes, and equity implications such as whether any particular social groups would be particularly helped by the scheme.

Through such a pilot, the downside risks of grant or loan schemes could also be assessed. Potentially, increased public funding of PET (either as grants or loans) could crowd out some of the extensive and valuable private financing which targets training on those most likely to benefit. This might undesirably shift financing burdens away from enterprises to individuals backed by government.[11]

If the pilot evaluation is sufficiently positive, the Switzerland-wide implementation of an income-contingent loan and grant system would be relatively unproblematic (following OECD, 2008, Chapter 4): income tax evasion is low; the income tax collection system is well developed; public funds for making the initial investment are available; financial markets are well developed and have experience of similar loan schemes.

Notes

1. The average cost of examinations in 2006 was about CHF 1 700 and CHF 2 500 for Federal and Advanced Federal PET Exams respectively (PwC, 2009). A new regulation grants a uniform federal support for all professional exams covering 25% of exam costs starting from January 2011 (OPET, 2011a).
2. The findings of the BASS (2009) study are based on a survey of students and training providers in selected occupational fields where full sample coverage was attempted. Hence, the study cannot be taken as representative of the whole PET system. The results of a new comprehensive survey which is currently under way are expected to be published by the end of 2011 (OPET, 2011b).
3. Taxation of personal income varies among cantons.
4. Cantonal and federal governments cover much of the training costs beyond the costs enumerated above from the viewpoint of the students. An overview of financial flows in PET among training organisations and government institutions are analysed in (PwC, 2009).
5. In order to fully understand the performance of PET and how well it serves the Swiss economy and society detailed analysis would be necessary which could reveal the main driving factors and obstacles to entry, the number of those who face effective entry barriers and potentially the amount of workers entering PET under different scenarios (*e.g.* funding, entry conditions). Such study could exploit the existing wide differences across sectors and geographical locations within Switzerland.
6. Full-time students' workload is not discussed in detail here as conflicts among time spent on study, work, and family activities are less likely to arise.

7. "1-0.11": proportion of those not dropping out from a PET course; "1-0.04": proportion of those who did not sign up for the exam even though they attended the last semester of their training; "1-0.13": proportion of those who passed the exam they signed up for.

8. In this context, open access means that countries offer automatic access to postsecondary VET to holders of secondary school leaving certificate. Switzerland is considered a country with selective entry conditions as relevant secondary VET degree and a certain amount of work experience is required for postsecondary VET entry in most professions.

9. There is one outlier university in terms of fees charged which is *Università della Svizzera italiana* (USI). It charges CHF 4 000 per year for Swiss nationals and CHF 8 000 per year for foreign students. It is excluded from the above statistics in order to represent the typical characteristics of the Swiss university system.

10. Governments can reasonably prioritise some education sectors over others if they have explicit policy goals to achieve with them and external social benefits underpin such funding differentials. For example, providing additional grants in VET professions where there are acute labour market shortages is common practice across OECD countries (OECD, 2010b).

11. The latter impact is *a priori* expected to be weak as grants tied to low income would primarily target those currently facing an access barrier to PET; hence, they are likely to represent additional funding as opposed to relocated funding.

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Chapter 3

Making the market work better - inter-cantonal financing arrangements

Variations in financial support for professional education and training (PET) between cantons may be distorting the market in PET provision. This review therefore strongly supports the current initiative to implement an inter-cantonal funding arrangement on the same model as already exists for other education sectors.

Challenge

The diversity of cantonal arrangements for funding professional education and training (PET) creates two challenges. First, the lack of effective co-ordination across cantons distorts the PET market both for professional colleges and for preparatory courses for national PET examinations. Second, these market weaknesses may sustain inefficient training provision, distort student choice, and lead to inefficient public spending.

The market for professional colleges and preparatory courses is distorted by uncoordinated cantonal financing arrangements

Some of the features of functioning markets (see for example Samuelson and Nordhaus, 2001) are present both for professional colleges and preparatory courses (OPET, 2011):

1. *Students are free to choose* among training providers and courses, their choice being limited only by price and basic entry conditions such as experience relevant to the course to be attended.[1]
2. *PET providers are free to choose* their students as long as they make sure that nationally defined minimum criteria are met.
3. *Entry to and exit from the education market* for PET providers is subject to some basic quality conditions. Preparatory course providers typically face no quality assurance procedure for entry, but professional colleges are accredited based on their core curricula by the Federal Office for Professional Education and Technology (OPET) and inspected by cantons.[2]
4. *Price and quality of courses* may vary across providers and training programmes.

Student choice of provider and training programme is constrained by the existing financial arrangements in and among cantons. Cantons receive a lump sum from the federal government for the whole VET/PET sector based on the number of VET students. From the allocated federal subsidy, they are free to devote a portion to PET while they may also add to the funding from their own resources (Federal Vocational and Professional Education and Training Act of 2002). Most cantons fund some professional colleges within the canton directly instead of, or as well as, funding students, employing their own criteria.[3] Preparatory courses are usually not funded, except in cases of historical or economic importance. Cantons differ in terms of the relative weight of professional colleges and preparatory courses in overall

cantonal funding of PET (OPET, 2008). According to the only detailed study on PET financing, more than 70% of professional college costs were covered by the public in 2006, but for preparatory courses the comparable figure was between 10 and 15% (PwC, 2009).[4] The diversity of cantonal approaches is large (OPET, 2008). For example, the canton of St. Gallen funds both professional colleges and preparatory courses within the same framework and supervises both subsectors in order to assure quality going beyond federal requirements.[5] Interestingly, many of the professional colleges also offer preparatory courses – St Gallen provides a similar level of subsidy to both private and publicly owned providers.

While differences in cantonal funding are a natural expression of cantonal differences, they can create market distortions as the success and financial viability of PET providers depend not only on their competitive performance, but also on cantonal preferences and funding arrangements. The regulatory framework is, however, in flux. The Swiss authorities and social partners have been working on a new continuing education law since 2006 in order to find ways to implement the new competences conferred on the federal government by the new Educational Constitution of 2006 (Ehrenzeller, 2009; EVD, 2009). The new law under preparation is likely to encompass preparatory courses and amend the cantonal funding principles and quality assurance procedures. The final form of the new law remains uncertain as the consultation procedure is likely to start not before the third quarter of 2011 (SVEB, 2011), but this direction of reform could bring more transparency and uniformity to funding and improve the quality assurance of preparatory courses. Funding arrangements for professional college courses is under revision at the moment too. In 2010, the Swiss Conference of Cantonal Ministers of Education (EDK) carried out a consultation process involving all major stakeholders (EDK, 2011) envisaging a new inter-cantonal concordat on financing professional college courses (OPET, 2011). Cantons would be free to join or not join this concordat and some cantons may need strong incentives to join, as some cantons inevitably would lose from the concordat. Nevertheless, past experience suggests that very few existing concordats cover all 26 cantons and the pattern of inter-cantonal concordats does not necessarily reflect the inter-dependencies among them (OECD, 2011). Cantons further away from each other, smaller cantons, and cantons with different official languages are less likely to enter into a joint concordat especially in the field of education, innovation, and culture (Bochsler, 2009).

One indication of cantonal differences in terms of public financing of PET, and hence the potential approach to a new inter-cantonal financing agreement, is provided by their relative shares in the total number of PET graduates and overall PET costs. These differences reflect not only the

relative sizes of PET in each canton, but also the differences in the mix of public, industry-run and private PET providers which rely on public funding to varying degrees (see Table 3.1). Bern, Tessin, and Zurich bear a much larger proportion of costs than graduations, while Aargau, St. Gallen, and Thurgau turn out comparatively more graduates than their share in costs. These differences can be interpreted in a number of ways, for example the first group of cantons may subsidise PET relatively more heavily, or they may host a comparatively more expensive mix of PET provision than the second group. But inter-cantonal student flows play a role in explaining these differences as "sender" cantons (where the student lives) typically pay less for their students than the receiver cantons for their own students (PwC, 2009). On average, sender cantons paid 64% of the costs compared to the receiver cantons in 2006 (without counting hoteling and catering this figure is only 30%). Overall 30% of PET students come from a canton other than the training provider's canton (OPET, 2008).

Table 3.1 Cantonal shares in the national number of PET graduates and PET cost, 2007

	Share in graduations	Share in costs	Difference: graduation-cost share (percentage point)
Bern	13.5%	19.4%	-5.9
Tessin	2.5%	5.5%	-3
Zurich	21.9%	24.9%	-3
Graubünden	2.8%	5.5%	-2.7
Geneva	2.3%	4.4%	-2.1
Basel-city	1.5%	2.9%	-1.4
Basel-agglomeration	2.6%	3.3%	-0.7
Neuenburg	1.6%	2.3%	-0.7
Waadt	5.6%	6.0%	-0.4
Jura	0.5%	0.7%	-0.2
Uri	0.4%	0.4%	0
Appenzell I.Rh.	0.2%	0.1%	0.1
Glarus	0.4%	0.3%	0.1
Nidwalden	0.6%	0.4%	0.2
Obwalden	0.5%	0.3%	0.2
Appenzell A.Rh.	0.6%	0.3%	0.3
Schaffhausen	1.0%	0.6%	0.4

Table 3.1 Cantonal shares in the national number of PET graduates and PET cost, 2007 (continued)

	Share in graduations	Share in costs	Difference: graduation-cost share (percentage point)
Schwyz	1.7%	1.1%	0.6
Freiburg	2.3%	1.6%	0.7
Solothurn	3.3%	2.4%	0.9
Zug	2.1%	1.2%	0.9
Abroad	1.2%	0.0%	1.2
Wallis	2.6%	1.2%	1.4
Luzern	7.7%	6.1%	1.6
Thurgau	2.8%	1.2%	1.6
St. Gallen	7.5%	3.8%	3.7
Aargau	10.2%	3.8%	6.4
Switzerland	100.0%	100.0%	-

Source: OPET (Federal Office for Professional Education and Technology) (2008), *Bericht der Arbeitsgruppe Masterplan zur interkantonalen Finanzierung der höheren Berufsbildung*, OPET, Bern.

The current arrangements for funding students moving between cantons are complicated, difficult to comprehend for students, and reflect many historical idiosyncrasies. They reflect a patchwork of bilateral agreements between cantons fixing transfer payments on a training course and provider level (OPET, 2011).

Inter-cantonal financing arrangements clearly affect the study choices of students. In professional colleges visited by the OECD team about 5-10% of applicants apparently had to withdraw due to the lack of inter-cantonal financing support.

In a typical case, the applicant approaches the PET provider of her or his choice in the canton other than their canton of residence. If the provider finds the applicant suitable for acceptance, it assists the applicant in finding out the amount of financial help available from their canton of residence. At this point the student learns whether the course and the provider are part of an inter-cantonal agreement, or not. If it is not, then she or he can still attend the course, but will receive no financial contribution from the canton, considerably increasing the cost of the PET programme. According to students and professional college teachers interviewed by the OECD team,

the system is not easily comprehensible for students and burdensome for the schools. It is also unfair. Students coming from different cantons, but attending the same PET course pay different fees due to their different canton of residence rather than their performance or experience.

The deficiencies of PET college and preparatory course markets may sustain inefficient training provision, distort student choice, and contribute to inefficient public spending

These financing arrangements clearly hamper student mobility across cantons. As many of the cantons host only small markets for professional colleges and preparatory courses in each economic sector,[6] the effective choice of students often comes down to one or only a few providers in their canton of residence.[7] On the supply side, the PET providers' pool of potential applicants is also more limited. Some PET providers may therefore act as local monopolies backed by public subsidy, limiting effective competition.[8] Some cantonal funding priorities may be justified as there might be beneficial local externalities or some cantons may compete for individuals with lower tax rates also implying lower public subsidies for PET, but these would have to be weighed against impacts on the national economy (OECD, 2009). There are indications of existing considerable quality differences across PET providers within each profession; more competition could yield efficiency gains.

Recommendation

As already envisaged by the Swiss authorities, implement an effective inter-cantonal financial agreement allowing for consistent and co-ordinated funding across cantons in support of an effective PET market.

Supporting arguments

This OECD recommendation reflects the need for Switzerland to proceed energetically with its current initiative (OPET, 2011). First, it would potentially increase the quality and efficiency of PET provision. Second, it would allow the inter-cantonal funding in PET to match in terms of coherence, that in VET and academic tertiary education where funding follows the student regardless of the canton. Third, it would enhance the capacity of the PET market to mediate between cantonal priorities and national interests and make PET funding more transparent.

Better functioning PET markets would increase quality and efficiency of provision

Competition among schools for students appears to have unclear impacts on quality and efficiency as the precise institutional setting and research methods are very important;[9] the nature of competition between private and public providers plays an important role (Waslander, Pater and van der Weide, 2010). But markets were found to have a positive impact on flexibility, innovativeness, and diversity of VET training provision in Australia (Anderson, 2005) and in general education in some other countries (Waslander, Pater and van der Weide, 2010). In the Swiss PET sector, better functioning markets' most important positive impact could be to reward and encourage better quality providers, and discourage weaker providers.

Effective inter-cantonal funding arrangements for PET would match those for other education sectors

The Vocational School Accord of 2006 regulates the cantonal financing of upper secondary VET.[10] In a typical case, the canton of residence pays the canton of VET provision a lump sum per student each academic year, calculated on the basis of the average cost of VET provision according to major study types (*e.g.* full-time apprenticeship). For the Universities of Applied Science (*Fachhochschulen*) (UAS), cantons cover the costs of their students studying in another canton through lump sum transfers per student amounting to 85% of average costs in each academic field (Inter-cantonal Universities of Applied Science Concordat of 2003). A similar agreement has existed for universities since 1997 (Inter-cantonal University Concordat of 1997). Due to the introduction of uniform funding principles and cost accounting methods in academic tertiary education, the average costs of education programmes have converged considerably and inter-cantonal co-operation has increased (*e.g.* in joint masters programmes) (Fuentes, 2011).

Given these successful precedents, implementing a similar model for PET would remove an unfortunate anomaly. It would also build on existing practice which determines payments from sender to receiver cantons according to the average cost of training provision by main types of training (in PET this could be differentiated according to professional group and professional colleges and preparatory courses). The necessary precondition for this kind of arrangement is a more complete and uniform cost accounting system for all PET providers across the whole of Switzerland.

Enhanced inter-cantonal mobility would mediate between cantonal priorities and national interests in PET provision

Currently, cantons have incentives to invest in PET according to purely local benefits of PET which come from local externalities, such as PET graduates staying in the canton of training and paying higher income tax. This may harm overall economic performance as it discourages cantons from funding training which benefits the country as a whole but not the canton (OECD, 2011, 2009). Such local priorities could be mediated by effective national or regional PET markets where funding follows the student beyond the canton of residence and income-contingent loans facilitate access and choice across geographically distant providers. Cantons would still be able to fund the professions and providers of their preference, but they would face the full cost of these measures.

An agreement which increases the transparency of PET funding is desirable in itself and the precondition for further effective policy change. Underpinning this would be better data, including data on student numbers, training costs, and financial flows.

Notes

1. Entry conditions vary greatly across professions and between professional colleges and preparatory courses. While entry conditions generally apply to professional exams rather than the preparatory courses themselves; effectively, students choose to attend a preparatory course only if they completed or are close to completing them by the end of the preparatory training.
2. Conditions vary across professions and between professional colleges and preparatory courses in this respect as well. While preparatory courses typically face no quality assurance procedure, professional colleges' training programmes are approved by OPET based on the proposed core curricula (EVD, 2010).
3. A recent lawsuit whereby a professional college challenged the canton's decision on declining public funding to the college signals that cantonal funding decisions are not unproblematic.

4. Unfortunately, this study is not based on a representative sample of PET training providers, hence the findings cannot be taken as valid for the whole PET sector. It only covers selected areas of training such as transport, business, or agriculture (for more details on the methodology see PwC, 2009).

5. For more information see Canton of St. Gallan, 2011. The model for the agreement between PET providers and the canton can be found at AfB (2011).

6. Cantons often have specialised PET provision reflecting the specialisation of their local economies.

7. The OECD team came across examples where PET provision was not available in certain professions implying that the students had to attend courses in another canton. There is no available statistics which would precisely state the extent of this phenomenon.

8. This argument primarily applies to the courses within a given profession, but in some cases to the choice of profession within a branch when there is no available course in some professions in the given canton.

9. Efficiency is understood here as technical efficiency whereby a given level of student outcomes can be achieved using more or less inputs.

10. Only the cantons of St. Gallen and Zurich did not join this agreement. The inter-cantonal movement of their VET students is regulated by separate agreements.

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Chapter 4

Making the professional education and training (PET) market work better – transparency and quality

The professional education and training (PET) market, including preparatory courses for federal exams and professional colleges, is not as transparent as it needs to be to serve the interests of students and in order to ensure an efficient market. To this end, this review recommends the collection and dissemination of more information on course quality and costs, and encourages more effective self-regulation of preparatory courses for the professional exams.

Challenge

Transparency and quality are separate but related. There are two main challenges. First, the information available for students and applicants about professional education and training (PET) courses is often insufficient for students to make good choices, weakening the incentives for providers to deliver quality training. Second, particularly in the absence of such market incentives, the absence of external quality control on preparatory courses is a significant challenge.

Lack of information about PET courses weakens markets

Given that the quality of education provision is not usually transparent, information on course and provider quality is an essential element of well-functioning education markets (OECD, 2008 Chapter 3; Cabrera and La Nasa, 2002). In the context of vocational education and training (VET), effective provider markets need to offer a range of indicators of course quality, including student achievement, labour market success of graduates or drop-out rates.[1] In the absence of such information students rely on informally networked assessments of school quality. Such informal information is often incomplete and biased, unevenly available across social groups, and adjusts to school quality changes only slowly. (Cabrera and La Nasa, 2002). These challenges are even more pronounced in the case of diverse training providers offering preparatory courses (the methods of instruction can be, for example, coaching, class teaching and distant learning).

In Switzerland, even though data on preparatory course providers are incomplete, there were at least 500 providers offering more than 1 000 courses preparing students for the 400 professional exams across the whole country in 2008 (OPET, 2011). But, several cantons had few providers (OPET, 2008). 200 professional colleges offered 407 degree programmes in 2008, but half of Swiss cantons offered less than six professional college degree programmes. Often a typical PET applicant interested in one profession, has limited choice, given that inter-cantonal mobility is constrained. A better choice of providers and courses is possible in the technical, business and healthcare professions which together represent more than half of PET graduations and exams (BFS, 2010a, 2010b).

According to the only – non-representative – survey of PET students (BASS, 2009), the second most frequently quoted criterion for PET provider choice is high reputation; similarly important is that the provider is well known (Table 4.1). But pass rates are quoted only by about every tenth respondent of the survey. Reputation and the knowledge of the provider

point to the importance of informal knowledge sharing (Waslander, Pater and van der Weide, 2010). This was confirmed by those interviewed by the OECD team who explained that students typically rely on course quality information conveyed by informal networks and "word of mouth". The relatively low weight assigned to pass rates in determining the choice of provider may suggest that there is not enough information available for it to play a substantial role in the choice process.

Table 4.1 Most frequently quoted criteria for provider choice, 2008

Criteria	Proportion of respondents (%)
Provider is in the region, short travelling distance	73.4
Provider has a high reputation	40.4
Training at the provider is practice and profession oriented	37.6
Provider offers convenient time schedule	34.3
Known provider, guarantees serious training	29.7
Provider offers good price/quality ratio	20.5
Provider has above average pass rate at professional exams	9.4
The offer of provider is unique in Switzerland	3.9
Other	6.1

Source: BASS (*Büro für Arbeits- und Sozialpolitische Studien*) (2009), *Finanzflüsse in der höheren Berufsbildung – Eine Analyse aus der Sicht der Studierenden*, OPET, Bern.

Table 4.1 shows that quality and cost have a relatively small bearing on the choice of courses. This is not surprising given that there is no readily available source - either public or private - offering comparative data on course quality and cost. However, there is an Internet site providing information on professions and training content – not including course quality and cost - both for secondary and tertiary students (*www.berufsberatung.ch*). Drop-out rates, pass rates, and quality of instruction vary a lot across providers according to the evidence provided to the OECD by representatives of professional colleges and labour market associations. Lack of information on course offerings, costs, and quality may also act as barrier to entry into PET for some, adding to the financial barriers to PET discussed earlier. Even large employers (including some interviewed during the OECD visits) sometimes lack the basic quality information on PET providers necessary to make an informed choice of course.

Lack of external quality control for preparatory courses is a challenge

In the absence of federal requirements on providers of preparatory courses, cantons could stipulate additional requirements for preparatory

course providers; but this is very rare. While the regulatory framework is expected to change in the near future, amending the cantonal funding principles and quality assurance procedures, the exact direction of these changes is as yet unclear. The existence of providers of poor quality was raised by representatives of labour market associations interviewed by the OECD review team especially with regards to preparatory courses. It is also unsettling that a large segment of PET covering all major professional fields does not fall under the regulation either of professional colleges or preparatory courses. About 20% of PET students (2009/2010) attend such courses (BFS, 2011).

Recommendation

Collect and disseminate better information from PET providers on course quality and costs. Encourage industry self-regulation of preparatory courses to ensure high and consistent standards.

Supporting arguments

Implementation of this recommendation would improve PET market mechanisms in at least two major respects. First, better data on PET providers would contribute to better informed student choice. Second, industry self-regulation of preparatory courses would increase quality by setting minimum standards and supporting quality improvement without an excessive burden of government regulation.

Better data on PET providers would lead to better informed student choice

In education more widely, when information is available in a standardised and accessible format such as school league tables or university rankings published on the Internet, the majority of students make use of such data. The impact on choices depends on factors such as the availability of alternative schools, but on average it is only modest. This is because students rely on a mix of information sources among which official performance data is only one (Waslander, Pater and van der Weide, 2010).

In Swiss PET, better data would be helpful both to students and other stakeholders, including employers. As many informal networks conveying information on courses and providers tend to be local in nature, the provision of national performance and cost data on all PET courses and providers would also help inter-cantonal mobility and strengthen competition among providers.

Currently basic statistical information on PET is missing or incomplete (OPET, 2011). The collection of quality and cost information on courses and providers would also contribute to the evidence base used in Swiss tertiary education policy making. The previous section on inter-cantonal financing arrangement envisaged better data collection regarding PET finances. The recommendation on transparency and quality would go further in this direction and would allow for the exploitation of synergies (*e.g.* provider efficiency figures can be calculated by combining course cost and quality indicators).

Such indicators might cover:

- pass and dropout rates;
- training costs for students as well as provider costs;
- basic data on students (*e.g.* gender, educational background); and
- additional data on training quality.

In Switzerland, extensive data collection from providers is standard practice in academic tertiary education (OECD, 2009) and basic information from professional colleges is already collected by BFS (*Bundesamt für Statistik*) (see for example BFS, 2011). Hence, the Swiss federal government and cantons have the capacity to implement similar arrangements in PET, although it would require a considerable effort to identify PET providers. While professional colleges are registered and approved by the Federal Office for Professional Education and Technology (OPET), preparatory courses face no such requirement. As a result, there is no complete list of providers of preparatory courses (OPET, 2011). In order to identify them at least a simple registration procedure would be necessary as a precondition for providers to offer courses.

Dissemination might be pursued in a number of ways. One option would be to charge a federal public organisation with data dissemination. For example, the existing information portal for career guidance – *www.berufsberatung.ch* – operated by the Swiss Conference of Cantonal Ministers of Education (EDK) might be extended to report on provider and course level information. It is a standard practice in tertiary education across OECD countries to publish performance data regularly to aid student choice; see for example the United Kingdom or Poland (OECD, 2008, Chapter 5) although in the field of VET the publication of institution-specific performance data is less common (OECD, 2010).[2] An alternative option would be to provide data and perhaps a measure of support to other bodies offering data and advice.

Industry self-regulation could improve quality without burdensome government regulation

Many OECD countries regulate the market entry of training providers, using rules regarding, among other things, the number of academic programmes offered, the student-teacher ratio, the proportion of full-time professors and their academic qualifications (Spain) to approval of the curriculum plans and programmes by an examining public university (Chile) (OECD, 2008, Chapter 3). But such arrangements typically regulate inputs rather than outputs. Ideally regulation should be a route to quality improvement, and support peer learning by providers. The facilitation of peer learning among providers is already high on the agenda of OPET which regularly runs workshops for professional colleges and exam organisers to this end.

Currently, professional exams are largely managed by labour market organisations and preparatory courses are sometimes directly delivered by providers owned or managed by industry. The freedom to offer a course created a dynamic market for preparatory courses populated by a mix of private, public, and semi-public providers (OPET, 2011). As exams, in principle, represent the final check on the students' knowledge there are good arguments for avoiding heavy-handed regulation of preparatory courses. But the vast majority of those who take a professional exam attend a preparatory course and so it is in the public interest that courses attended by PET students are of adequate quality.

Given the (desirably) dominant position of labour market organisations in PET, excessive government intervention is undesirable and potentially unfeasible. But, there are alternative routes to good regulation including industry self-regulation (Hepburn, 2002; OECD, 2002). If the federal state permitted professional and labour market organisations to regulate preparatory courses registered by the federal government it could also imply a flexible system where those organisations most concerned about course quality pursue self-regulation most rigorously. Self-regulated professions could set minimum standards for preparatory courses and could also provide guidance for worst performing providers. During the OECD visits to Switzerland, some representatives of employer and professional organisations favoured such a regulatory solution.

As a number of employer and professional organisations have their own providers for preparatory courses which compete with other providers it would be imperative to assure that industry self-regulation does not lead to market distortions unfairly favouring industry-run courses.

Notes

1. Although there is at least one important difference between the Swiss PET market and education markets in school education and academic tertiary education: PET applicants and students are already active on the labour market before and typically also during their training. This potentially implies a different student choice process as applicants and students have a fairly good idea about labour market demand and their career prospects.
2. One example of institution specific performance data published alongside occupation specific information on a VET career guidance site can be found in Hungary at *http://szakmavilag.hu/*.

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Chapter 5

Responding to globalisation and technological change

International audiences, including foreign nationals based in large companies in Switzerland sometimes do not understand or fully recognise the quality of Swiss Professional Education and Training (PET) qualifications, particularly in relation to more internationally familiar university qualifications. This review recommends measures to secure this recognition partly through stronger articulation with the academic tertiary sector and partly by embracing international networks of providers.

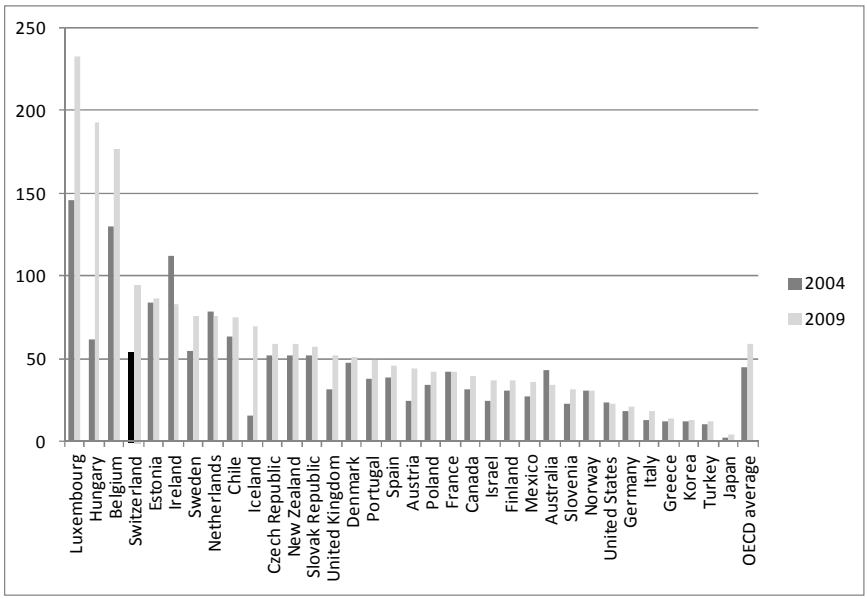
Challenge

Switzerland has a small open economy strongly integrated into both European and global trade networks. It depends, to a significant extent, on a small number of high-end niche markets such as private banking and pharmaceuticals. While this openness and specialisation are key assets, they also create certain vulnerabilities. First, international competition puts pressure on the Swiss economy and therefore on the professional education and training (PET) system which supports it. Second, the internationalisation of the Swiss economy requires a system of PET qualifications which are well recognised both internationally and domestically; but currently many of these qualifications lack sufficient recognition by foreign companies. Third, some barriers to transition from PET to academic tertiary education endangers the high status of PET, particularly when viewed from an international perspective. Finally, many of the professions in the PET system are becoming more international in their competence requirements.

International competition puts pressure on the Swiss PET system

Pharmaceuticals accounted for almost one third of all exports in 2010 and high-precision instruments, clocks, and jewellery for almost one fifth (BFS, 2011a). The EU accounted for 68% of all Swiss trade in 2010 (IMF, 2011). There is extensive inward and outward foreign direct investment (FDI) with the stock of inward FDI reaching 94% of the Swiss GDP in 2009, the fourth highest figure among OECD countries (see Figure 2.1).

Figure 5.1 Inward foreign direct investment stock as a percentage of GDP



Source: United Nations Conference on Trade and Development (UNCTAD) (2011), UNCTAD website, *http://unctadstat.unctad.org/*, accessed August 2011.

In Switzerland two continuing parallel trends are important. First, the demand for most highly skilled technical "PET" professions is forecast to be relatively stable between 2010 and 2020, so that they will decline in relative importance on the Swiss labour market; while demand for most of the managerial professions in SMEs and large enterprises is expected to expand in the coming decade (CEDEFOP, 2010a; also see section on key international indicators). Second, the "skills intensity" of many professions is increasing, *i.e.* the skills required to undertake that profession are becoming more demanding (CEDEFOP, 2010a).

These trends imply that the demand for PET graduates is likely to be stable or slightly decline in the traditional PET technical occupations; but there will be expanding demand in the set of occupations where there is competition between PET and academic tertiary graduates – for example in ICT, managerial and commerce positions. This will intensify the challenge of labour market recognition (or lack thereof) of PET degrees. Changing "skills intensity" will require the PET system to flexibly adjust the content of provision and qualifications (on professional contents see below).

A somewhat different light is shed on PET provision by looking at productivity performance. While Switzerland is one of the richest OECD countries, its productivity gap *vis-à-vis* the best performing countries has widened in the last decade (OECD, 2009). Although causal interpretation is problematic, detailed enterprise level econometric analysis of Switzerland suggests that university graduates have a positive impact on productivity generally and non-university tertiary graduates (Universities of Applied Science (UAS) (*Fachhochschulen*) and PET) have a significantly positive impact primarily in manufacturing (Arvanitis, Bolli and Wörter, 2010).[1] Furthermore, the relationship between firm level productivity, wages, and worker composition is complex: workers with apprenticeship education have a positive wage impact on tertiary educated workers and tertiary educated workers increase overall firm productivity (Backes-Gellner, Rupietta and Tuor, 2011). The suggestion that stronger tertiary level training (including VET/PET) would be helpful is supported by the literature on the links between innovation and productivity among OECD countries as it suggests high-wage economies' competitive advantage and future growth largely depend on innovation and research and development (R&D) (Guellec and Pilat, 2008). While Switzerland's R&D and innovation performance is outstanding in respect of indicators like R&D spending or scientific publications per million population (OECD, 2010b); the pace of productivity growth might be accelerated further by more extensive use of tertiary vocational skills (Arvanitis, 2006). While specific quantitative evidence is not available, the PET system might usefully do more to develop the skills and competencies necessary for innovation and productivity improvement (Toner, 2011), especially with regard to start-ups and SMEs which could drive innovation in emerging sectors (Guellec, 2006), both areas represent a traditional focus of PET (see for example the traditional *Meister* title preparing professionals for running their own business).

International recognition of PET qualifications is inadequate

Many stakeholders believe that the PET system lacks sufficient recognition among foreign owned companies[2] in Switzerland (OPET, 2011a) and among company staff from abroad. Many highly qualified jobs in Switzerland can be filled by graduates of the PET system as well as by the graduates of tertiary A programmes in universities and UASs. But, the PET system is much more salient in Switzerland than in the countries from which most inward Swiss FDI originates: the Netherlands, United States, France, or the United Kingdom (OPET, 2010; OECD, 2011). So, many of the foreign companies investing and operating in Switzerland are unfamiliar with the Swiss PET system and may therefore prefer the more familiar qualifications of graduates of universities and UASs to PET qualifications. Unfamiliarity may also mean that foreign companies are less willing to send

their employees to preparatory courses or professional college courses (foreign-owned companies are less likely than Swiss-owned companies to train apprentices in Switzerland (Mühlemann *et al.*, 2007)). Employer associations told the OECD team that it was often difficult to accommodate foreign-owned enterprises into the Swiss PET system. At the same time, some foreign companies that have gained familiarity with the Swiss PET system, now make use of and contribute to it considerably.

The high average rate of return to PET degrees indicates that PET is generally well-respected in the labour market (Wolter and Weber, 2005; Cattaneo, 2011). But in sectors where foreign ownership is widespread such as information technology competition from universities may be salient.

Barriers to transition endanger the high status of PET

In Switzerland transition from upper secondary VET to UASs is conditional simply on obtaining a Federal Vocational Baccalaureate (*Berufsmaturität*) (Hoeckel, Field and Grubb, 2009). But transitions from PET are more complex. Transition from PET to UAS is generally dependent on the specific institution, even though the Rector's Conference of the Swiss Universities of Applied Sciences has issued guidelines concerning the admission of PET graduates into bachelors' programmes (Konferenz der Fachhochschulen der Schweiz, 2006). Some university faculties also admit PET graduates on varying criteria (Rektorenkonferenz der Schweizer Universitäten, 2011).

According to a representative sample of male workers in the 1999–2005 period, 4% of all male tertiary graduates followed a "mixed" education pathway starting with a vocational degree (Backes-Gellner and Tuor, 2010). Many come through the increasingly popular route of Federal Vocational Baccalaureate (Hoeckel, Field and Grubb, 2009). But, in 2009/2010 only 3.2% of students enrolled in UASs held a PET diploma as a prior qualification,[3] suggesting that the transition from PET to UAS is either difficult or unattractive even though the exact reasons are unknown.

Barriers to the transition from PET to academic tertiary education not only inhibit gaining additional skills, but also lower the status of the VET/PET track, since students may perceive the vocational track as a *cul de sac* especially in the more school-based professional college degree programmes. In the medium to long run, this is also likely to impact on student choice between PET and UAS as well as between vocational and academic tracks. This challenge is not unique to Switzerland, for example, as a result of a long reform process German tertiary education institutions grant access to tertiary VET graduates to bachelors programmes and in some cases to masters programmes too.

Skills requirements are becoming globalised

In Switzerland, the content of each PET qualification, described in competency profiles and certified by OPET, is primarily determined by employers and professional associations through the certification process (OPET, 2011b; OPET, 2007). Any company and professional association can contribute; but in practice companies more extensively engaged with the PET system contribute most fully. This ensures that the content of PET qualifications adequately respond to local business needs including Swiss national requirements.

But the Swiss economy increasingly requires skills which reflect European and global as well as national needs. The PET system therefore needs to balance local with international skills requirements when defining qualifications. This is also necessitated by the enhanced international mobility both of workers and students (OECD, 2010a; CEDEFOP, 2010b; Ward, 2009). Globalising influences are strongest in sectors where trade and FDI play a crucial role. For example, the content of professions tied to business accounting standards are changing fast in response to the internationalisation of these standards and the client base of such services (Nobes and Parker, 2008). Balancing local and international content in rapidly changing professions requires the active engagement of employers. This may be a particular challenge in Switzerland given the relatively weak integration of foreign-owned firms into the PET system.

Recommendation

Respond actively to globalisation and technological change by: *i)* improved permeability and collaboration between PET and academic tertiary education; and *ii)* strengthened international network building on sectoral and professional college levels.

Supporting arguments

The recommendation is supported by three arguments which also relate to potential implementation options. First, productivity in Switzerland might be improved by strengthening the PET system's contribution to innovation. This can be achieved by improving the permeability of tertiary education, especially by supporting transitions from PET to academic tertiary education; and by encouraging collaboration between PET and universities and UASs. Second, the PET system's internationalisation can be advanced by positioning it better both abroad and at home which would contribute to its competitiveness with academic tertiary degrees. The National Qualifications Framework (NQF) could be implemented in line with domestic as well as European demands and also by adequately "branding"

the Swiss PET system. Third, the PET system's internationalisation can progress on sectoral and professional college levels through networks of actors which would contribute to more internationally orientated training provision and professional content.

Improved permeability and collaboration between PET and academic tertiary education is needed

Increasing the permeability of the Swiss academic tertiary education system to PET graduates would help to preserve and indeed increase the status of PET, especially for professional colleges. It is suggested that granting PET graduates better access to academic tertiary programmes would yield good individual as well as social returns (see Arvantis, Bolli and Wörter, 2010, and references therein). In addition, advancing the academic skills of the Swiss labour force should further support the country's innovation and productivity performance. Strengthening the transition from PET to academic higher education should complement the existing strong labour market orientation of PET.

The existing access mechanisms could be complemented by strengthening federal support for credit transfer arrangements and standardised entry conditions and by offering targeted preparatory courses (Moodie, 2008, Chapter 8). The experiences of Germany and Austria in granting access to postsecondary VET graduates to academic tertiary education, in particular to masters' level studies may prove valuable for Switzerland (see Table 1.1 on regulations in Germany and Austria).

A strong national qualifications framework (NQF) could also help. Research evidence, mainly from the US, suggests that localised student transfer policies are less effective than a comprehensive policy even when holding academic standards, curricula, and student background constant (Moodie, 2008, Chapter 9). Access should be facilitated while retaining the filters which are necessary to ensure that all students entering academic tertiary education have the right preparation to benefit.

Better collaboration is needed between PET and academic tertiary education institutions while preserving the strong involvement of employer organisations. This would support PET in its teaching of general academic skills (see recommendation on general content of professional colleges below) and to improve its orientation towards innovation. Collaboration is more likely to involve UASs and professional colleges due to their similarities in terms of labour market orientation. Inevitably, UASs are likely to find it more attractive in terms of status to enhance collaboration with universities rather than with PET. But as institutions that are largely funded by the public, UASs have an obligation to work constructively with

other parts of the education sector, including PET, and they should have effective incentives to ensure that they do so.

PET needs to take advantage of the opportunities of internationalisation

Graduates of the Swiss PET system would be better placed in competition with holders of academic tertiary degrees both in Switzerland and abroad if the equivalence between PET and academic tertiary degrees were seen to be equivalent by key stakeholders. Currently, the Swiss authorities are in the process of preparing a National Qualifications Framework (NQF) in line with the European Qualifications Framework (EQF) aiming to improve transparency and comparability across a diverse range of PET and other higher education degrees and allowing for a recognition of equivalence between PET and academic tertiary education based on learning outcomes. Empirical research on the impacts of qualifications frameworks is scarce, but it suggests that NQFs at least potentially can help in improving pathways and credit transfer across educational sub-systems (Allais, 2010; Dunkel, Le Mouillour and Teichler, 2009). This beneficial impact is likely to be conditional on NQFs being developed in partnership with the respective educational institutions and the level descriptors and standards being simple enough for actors to comprehend (Allais, 2010).[4] At the same time there is no reliable evidence that existing NQFs improve the labour market recognition of vocational qualifications even when strong employer support is present; limited evidence points at successes in niche areas where strong support from human resources and recruitment firms helped raise the profile of specific qualifications (Allais, 2010).

Regarding recognition of PET abroad, embedding the Swiss NQF in the EQF may potentially bring some benefits. But differences in national approaches to NQF development and the diversity of actors and education systems suggest that the positive impacts will be limited.

Finally, positioning Swiss PET both domestically and internationally is likely to benefit from a resonant title for professional college degrees instead of the current ones which are difficult to recognise outside the Swiss national context. The degree titles should address both domestic and international audiences and effectively locate PET qualifications in relation to academic tertiary degrees. For example, the titles professional degree or Swiss professional degree could be used.

While globalisation presents challenges to the PET system, it also creates opportunities. If individual professional colleges and indeed PET professions extend their range of international contacts, that will support

more internationally oriented training provision and professional content. The OECD team has come across a number of promising practices throughout the review visits in sectors as diverse as catering-hoteling and graphic design.

Government support for the development of international networks of PET training providers would also contribute to enhancing the reputation and marketing the Swiss PET system and could potentially lead to professional exams recognised across borders.

Notes

1. There is a wide ranging debate on the role of academic as well as vocational graduates on firm productivity: on Germany, see for example Zwick (2005, 2007), Mohrenweiser and Zwick (2008), Addison *et al.* (2000); on Austria, for example Prskawetz *et al*. (2005) and Prskawetz, Freund and Mahlberg (2008); and further evidence on Switzerland, for example Arvanitis (2008) and Hollenstein and Stucki (2008).

2. Firm level evidence seemingly contradicts this argument as the share of PET graduates in comparable foreign and Swiss owned enterprises employing more than ten employees does not differ; albeit, among companies employing less than ten employees foreign owned enterprises employ significantly less PET graduates than their Swiss owned counterparts. The lack of statistical difference among foreign and Swiss owned enterprises may indicate that the decisive factor in the companies' recruitment and training policies is the orientation of the human resources decision makers and their knowledge of the Swiss education and training system which may not coincide with the ownership structure of the respective company (*e.g.* Swiss owned multinational may staff its human resources department with non-Swiss nationals who are less likely to know well the Swiss education and training system) (Mühlemann, 2011).

3. Special analysis of BFS (*Bundesamt für Statistik*) upon request.

4. A documented example of a National Qualifications Framework (NQF) which brought about in-transparency is the South African NQF (although it is being now reworked due to the realisation of its shortcomings (Allais, 2010).

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Chapter 6

Improving numeracy and literacy skills

Numeracy and literacy are of increasing importance in professional occupations, and the professional education and training (PET) system, alongside other parts of the Swiss education system need to address them more effectively. This chapter presents recommendations for the professional college system, in particular, to address weaknesses in basic skills identified at the outset of courses, following the best practice of many professional colleges that already pursue this approach.

Challenge

First, professional education and training (PET) students, like their vocational education and training (VET) counterparts, typically receive limited direct tuition in numeracy and literacy, although they may develop numeracy and literacy skills in the context of other training. Second, globalisation and technological change is intensifying the need for numeracy and literacy. Third, successful participation in continuing education crucially depends on adequate numeracy and literacy.

Clearly the primary responsibility for developing good numeracy and literacy skills falls on the compulsory school system. While recognising this, good basic skills are not always fully acquired at school, and they do need to be developed and maintained throughout life, as they underpin further learning. Higher level numeracy and literacy skills are also needed in more technical and managerial roles in the labour market. For this reason the issue remains relevant for all branches of post compulsory education and training, including the professional education and training in Switzerland.

VET/PET students receive limited direct tuition in numeracy and literacy

One of the key strengths of the Swiss VET/PET system is its strong practical and labour market focus (Hoeckel, Field and Grubb, 2009). But this does imply less instruction time for general academic skills such as literacy, numeracy, or foreign languages. Most PET students come from the upper secondary VET system, where practical training usually takes up more than half of the total instructional time - a high proportion by OECD standards (OECD, 2010). Apprentices typically spend one day per week at the vocational school and four days at the host company or at industry courses where they receive on-the-job training (Hoeckel, Field and Grubb, 2009). One day per week on average does not allow for extensive numeracy and literacy development for apprentices who represent the majority of Swiss upper secondary VET, even though there is no automatic correlation between instruction time and skills learned. In addition, this one day is shared between competing theoretical topics, including theoretical subjects related to their vocational skills and competences. Literacy and numeracy can be developed in practical contexts – for example when mathematics is used in technical occupations. But, making such "contextual learning" successful is challenging, as it requires careful planning and team-working among teachers to integrate practical training and the acquisition of general skills (OECD, 2010).

As most PET students are required to have two to five years of work experience in the relevant field, numeracy and literacy skills not used in day-to-day activities may tend to get weaker. Numeracy and literacy rarely forms a direct part of the PET curriculum either in preparatory courses or professional colleges; but many PET programmes aim to broaden the professional knowledge of students and this broadening is often mediated through literacy and numeracy. In many preparatory courses the main emphasis falls on deepening specialised professional and technical knowledge. In addition, the length of education is typically short, thus, there is relatively little time for improving general skills.

All of the professions involving federal diplomas require candidates to have good scholastic aptitudes, particularly in their mother tongue in order to pass written examinations, draft essays for their qualification and prepare a presentation. Mathematical skills are mainly used in professions within the secondary and tertiary sectors, which represent 95% of all professions for which a federal PET examination exists. The typical profile of a candidate preparing for a federal PET examination is someone aged around 30 with several years of professional experience and employed in a company.

Professional college degree programmes typically take longer, have more full-time students and offer a broader education than preparatory courses for professional exams (BFS, 2011). While this could, in principle, allow for numeracy and literacy development the emphasis in professional colleges mainly falls on vocational and professional subjects. Professional college degree programmes are highly variable in terms of the amount of general education offered. For example, according to the professional college representatives interviewed, in business and arts professions students typically have good numeracy and literacy (often having completed a vocational or academic baccalaureate prior to PET) and their training programme involves broad skills development such as management, communication, or team working. On the other hand, according to students and teachers interviewed, those studying in professional colleges from the technical and construction professions often have weaknesses in the numeracy and literacy skills (*e.g.* mathematics, German and English language knowledge and communication skills) which might underpin successful course completion. This is consistent with evidence from the Adult Literacy and Life Skills Survey (ALL). This measured the skills of adults aged 16-65 in four main competency areas: prose literacy, document literacy, numeracy, and problem-solving (Thorn, 2009). While the measurement was geared towards skills needed for every-day life and by no means directly related to exercises practiced at school, the data of the 2003 ALL survey in Switzerland showed a strong association between education type and test scores across all four competency areas even though causal

interpretation of the results is problematic (Notter *et al*, 2006, Chapter 3). Adults holding a non-university tertiary degree, including PET, performed worse than holders of a university degree, a pattern consistent across competency fields.

Weaknesses in numeracy and literacy are a potential cause of drop-out (defined as leaving the course and the course provider definitively) in PET. According to PET providers, the single most important reason for drop-out is missing competences, a pattern consistent both for professional colleges and preparatory courses (BASS, 2009). Students say that the main reason for the drop-out of fellow students is "too high" professional standards, but "missing prior knowledge" is also important (Table 2.4). While missing competences, too high professional standards, and missing prior knowledge go beyond numeracy and literacy the association is likely to be high. Professional college representatives interviewed by the OECD review team also stressed that general skills weaknesses pose problems for successful course completion. International evidence also suggests that weak academic performance is one of the most powerful predictors of drop-out from secondary as well as higher education which is in turn often influenced by general skills (Lyche, 2010; Rumberger and Lim, 2008; Hargreaves, 2004).

Table 6.1 Top 10 reasons for observed drop-out of other students, interrupting own PET studies, and changing own PET course, 2008

Reasons for interrupting own PET studies and changing own PET course, 2008 (% of respondents quoting)		Likely reasons for observed drop-out of other students, 2008 (% of respondents quoting)	
Personal reasons	33.2	Too high professional requirements	47.4
Too high time requirements at work	20.2	Personal reasons	41.1
Financial problems	15.2	Too high time requirements at work	37.3
Studies are far from practice	12.8	The provided curriculum is not interesting	35.7
Too high professional requirements	12.1	Important prior knowledge/experience is missing	33.3
Family reasons	10.8	Family reasons	30.1
The provided curriculum is not interesting	10.2	Change of job or profession	18.8
Important prior knowledge/experience is missing	9.8	Financial problems	18
Failed the interim exams	8.3	Studies are far from practice	8.6
The training doesn't bring any direct benefits for the present activities	6.8	Undesirable jobs and employment perspectives	3.8

Source: BASS (*Büro für Arbeits- und Sozialpolitische Studien*) (2009), *Finanzflüsse in der höheren Berufsbildung – Eine Analyse aus der Sicht der Studierenden*, OPET, Bern.

Globalisation and technological change increase the need for sound numeracy and literacy skills

Technological change has altered the skills mix necessary for many professions, particularly in high-tech and highly skilled professions. The importance of higher level problem solving and communication skills has increased (Autor, Levy, and Murnane, 2003) and such higher level skills are underpinned by basic literacy and numeracy skills. Industrial restructuring requires many workers to acquire new skills during their careers and sometimes change profession. Career adjustment necessitates the ability to learn which, in turn, largely relies on strong basic skills (OECD, 2010). This phenomenon has been well documented in a number of countries (*e.g.* Kézdi, 2006).

These labour market developments mean that any weaknesses in the numeracy and literacy of PET graduates will pose a growing problem. Unfortunately, empirical evidence covers only some aspects of the labour market outcomes of VET/PET graduates – for example there is no evidence on employers' satisfaction with VET/PET graduates' skills.[1] Employment rates according to education background differ markedly between academic and vocational tertiary graduates. While the employment rate of PET graduates is higher than that of academic tertiary graduates at the early years of their careers, this reverses by the last 10-15 years of their careers leading to an employment advantage for academic tertiary graduates (Fuentes, 2011). This could suggest PET graduates are less able to renew their skills and acquire new ones, perhaps because of the well-established role of literacy and numeracy skills in underpinning further learning. Nevertheless, more research is needed on skill renewal of PET graduates as the available evidence is inconclusive.

This interpretation is supported by econometric analysis of the depreciation of skills over time (Weber, 2010). As the initial length of studies decreases the rate of depreciation, PET graduates' skills depreciate slower than upper secondary VET graduates' skills. But PET graduates' skills depreciate faster than the skills not only of University of Applied Science (*Fachhochschulen*) (UAS) graduates and university graduates, but also holders of academic or vocational *Matura* – findings are consistent for men and women. Skills depreciation is significantly slower for professional college graduates than for examination graduates. These differences can be interpreted, partly in terms of the way in which technological change may make some vocational technical skills outdated, and partly because broader general skills underpin further learning at different points in a person's career. But the results should be treated with care as they are subject to cohort effects which are difficult to control.

Although the general skills of VET/PET graduates may allow them to adjust to changing labour market needs only partially, their specific skills still allow for a great degree of flexibility. Research done using German Labour Force Survey data revealed that profession specific skills allow for a great degree of mobility across professions which require similar skills profiles, even though they belong to different sectors and require the performance of rather different tasks (Backes-Gellner and Geel, 2011).[2] Mobility between professions belonging to the same skills "cluster" results in wage gains, whereas mobility across skills clusters lead to wage loss.

Sound numeracy and literacy supports lifelong learning and career development

Among adults, sound general skills underpin most kinds of further formal and informal learning, including basic literacy and numeracy skills as well as problem solving and communication skills (OECD, 2010; EVD, 2009). In Switzerland, adult participation is strong by international standards and given planned enhancements in regulatory support, this high level of participation should be sustained (EVD, 2009). As in other countries, participation in adult continuing education is heavily dependent on prior attainment, (Backes-Gellner, 2011), and highest for those with academic tertiary degrees. While participation rates are high for PET graduates they are even higher for holders of academic or vocational baccalaureates suggesting that there is a room for improvement (Weber, 2010).

Recommendation

Encourage a stronger emphasis on numeracy and literacy development in professional colleges, especially by introducing targeted measures for remediating basic skills gaps identified on entry.

Supporting arguments

This recommendation is supported by three major arguments. First, improved numeracy and literacy development in professional colleges would encourage course completion, support transition from PET to academic tertiary education, (especially to UASs) and contribute to better access to continuing education. Second, it would also improve the capacity to adapt to changing labour market requirements. Third, while strengthening basic skills development is potentially desirable for the whole PET sector, professional colleges have a particular need to implement remediation and improvement policies.

Stronger numeracy and literacy among PET graduates would support further educational participation

It is sometimes suggested that vocational tertiary graduates are unable to follow academic tertiary studies because they lack general academic skills (Moodie, 2008, Chapter 9). Where student transfer policies are strong and evaluated as successful (such as in California) general subjects play a crucial role: the overlap in the general curriculum between academic tertiary education and vocationally oriented postsecondary education facilitates student access to tertiary education (Moodie, 2008, Chapter 9). Stronger numeracy and literacy programmes in professional colleges could not only improve the access of professional college graduates to academic tertiary education, but could also contribute to a stronger credit transfer system (*i.e* wider recognition of courses completed at professional colleges when entering academic tertiary education). These arguments primarily apply to the UAS sector where there are already guidelines for accepting PET graduates, but could also bear on access to Swiss universities.

Stronger numeracy and literacy among PET graduates could also contribute to a higher participation rate in continuing education, as even within the group of tertiary graduates those with stronger document reading skills (level 1 and 2) are more likely to participate in continuing education (Notter *et al.*, 2006, Chapter 6).[3]

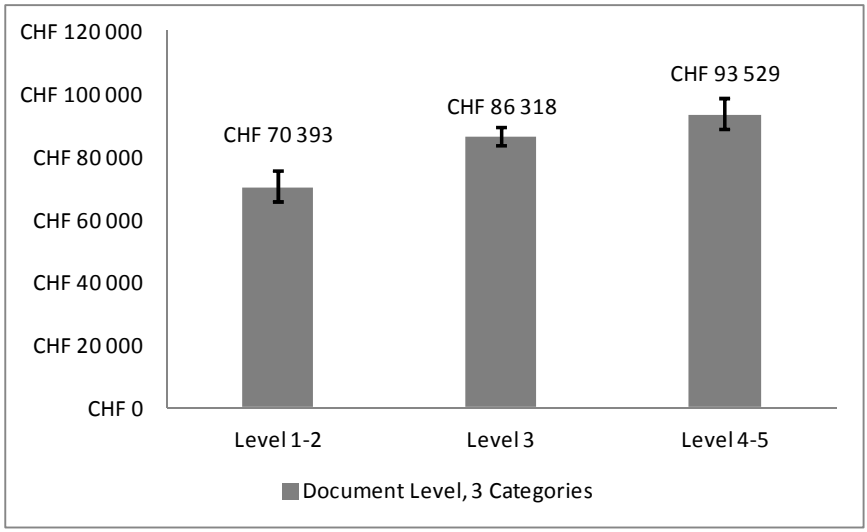
Stronger literacy and numeracy among PET graduates would improve labour market outcomes

Much research suggests that improving general skills such as literacy and numeracy decreases the probability of unemployment and increases earnings (Thorn, 2009; Green and Riddell, 2001; OECD and Statistics Canada, 2000). This argues for stronger general skills training to increase the adaptability of the labour force. While these studies typically look at the whole population of countries, the Adult Literacy and Life Skills (ALL) Survey allows for detailed analysis of Swiss PET graduates' labour market outcomes in relation to general skills. Simple comparison of PET graduates' earnings according to document reading skills levels shows how document reading skills have a positive impact on earnings (Figure 2.4) (the findings are consistent across competency fields hence only document literacy findings are reported here). Improving skills above the two lowest levels (levels 1 and 2) seems to have more positive impact in earnings than moving from medium level skills (level 3) to advanced skills (levels 4 and 5). Econometric analysis following Green and Riddell (2001) and OECD and Statistics Canada (2005) shows that for PET graduates medium level skills yield a 15-17% higher earnings premium compared to lower level skills

whereas higher level skills have a 25-32% earnings premium compared to lower level skills after controlling for gender, work experience, and area of residence (detailed results using a range of regression specifications can be found in Annex C). These figures are about twice as high as the ones found for the whole Canadian population using International Adult Literacy Survey (IALS) data (Green and Riddell, 2001), or for the whole Swiss population using ALL data (Falter, Pasche and Hertig, 2007). While more research is needed to firmly establish casual links, and control for further confounding factors such as sector-specific effects, the returns from medium and advanced level general skills relative to lower level general skills is higher for PET graduates than for the whole labour market.[4] This may imply that for many well-paid jobs for PET graduates, at least medium level general skills are required.

Figure 6.1 Average annual earnings of PET graduates according to skills level in document literacy, ALL Survey, 2003

(95% confidence intervals are indicated)



Source: OECD calculations based on Adult Literacy and Life Skills (ALL) Survey data, see: Falter, Pasche and Hertig (2007).

The professional colleges have a particular role in addressing basic academic skills

Challenges related to general academic skills confront the whole PET sector, albeit most likely to differing degrees as employers are ready to articulate general skills needs to differing degrees.

Preparatory courses are largely unregulated by the cantons and the federal government and are largely driven by labour market organisations and market forces, making state intervention into course content both difficult and perhaps inappropriate. On the other hand, professional colleges' degree programmes are certified at the federal level and regularly assessed by the cantons. As public funding is substantial for professional colleges, government preferences are more readily reflected in course content, besides responding to industry preferences. These make professional colleges better placed to remedy existing general skills gaps and further improve these skills.

This reform potential is already reflected in some professional colleges' practices. A professional college visited by the OECD review team tested the numeracy and literacy level of entrants and offered preparatory courses in the first semester for those with particular weaknesses, but who are otherwise suitable for a PET course. Building on this and similar existing practices of professional colleges can provide the models for reform which can be either required for other professional colleges or encouraged through peer learning. The goal of disseminating best practice would have to be to ease completion rather than representing an additional access barrier.

Notes

1. Such studies are standard practice among OECD countries. See for example, UKCES (2010) for the United Kingdom or Fazekas and Hajdú (2011) for Hungary.
2. The authors use the example of clockmaker and medical technician.
3. Although it must be noted that simple comparisons of group averages while informative cannot be interpreted as indications of causality. Further research could unearth the reasons behind different choices to engage in continuing education.
4. Due to the high employment level of PET graduates no significant result could be found when relating general skills levels and employment probabilities.

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Annex A: Overview of postsecondary vocational examinations in the three Germanophone countries: Austria, Germany and Switzerland

	Austria	Germany	Switzerland
Postsecondary professional examination	*Meisterprüfung/Befähigungsprüfung* (Master craftsperson examination).	*Fortbildungsprüfungen (Advanced Vocational Training Examinations) a set of professional examinations, among which Fachwirt (for people working in commerce), Industriemeister (for industry) and Handwerksmeister (for crafts).*	*Federal Professional Education and Training (PET) Diploma Examinations (Eidgenössische Prüfungen), including the Federal Diploma Examination (Eidgenössische Berufsprüfung) and the Advanced Federal Diploma Examination (höhere Fachprüfung).*
Objectives	To provide deeper technical skills and skills to run one's own business in the regulated trades (71 trades in 2009), to be entitled to train apprentices.	To provide deeper technical skills, to be entitled to train apprentices, to provide capacity to run one's own business in the regulated trades (for the *Handwerksmeister*) and to manage a team of people (for the *Industriemeister*).	To provide deeper technical skills and skills to run one's own business, to be entitled to train apprentices, to certify required competencies in legally regulated areas (*e.g.* electrician, tank inspector). Advanced Federal Diplomas represent a higher professional level than Federal Diplomas, but in many professions only one kind of PET Diploma can be obtained.

	Austria	Germany	Switzerland
Snapshot	In 2011-2010, the number of obtained Meister qualification was 3 536.	In 2010, the number of advanced vocational examinations passed was 93 357, among which the number of *Fachwirt* was 27 063, *Industriemeister* was 7 827, and *Handwerksmeister* was 19 659.	In 2009, 14 852 people obtained a national PET examination of which 12 184 was Federal Diploma Examination and 2 668 was Advanced Federal Diploma Examination.
Institutional setting	Master craftsperson exams are organised by the offices for master craftsperson examinations, which are located at the regional Economic Chambers.	The examinations are primarily managed by the Chambers of Commerce in the field of industry and by the Chambers of Crafts in field of crafts and trades. The main examinations (a little over two hundred) are federally regulated and consistent across the whole of Germany. Others (a little over three thousand) are managed by local chambers. The Federal Ministry of Education and Research is responsible for approving new Advanced Vocational Certificates and exams in accordance with the BMWi and after consultation with the Federal Institute for Vocational Education and Training.	The federal government, through the Federal Office for Professional Education and Technology, OPET, approves rules for professional examinations and recognises professional college degree programmes by approving the core curricula. The federal certification process ensures that there is no overlap between examinations and that the stakeholders reach a consensus regarding exam content without extensive government intervention.

	Austria	Germany	Switzerland
Pre-requisites	Candidates have to be above 18 years of age.	Candidates must have completed an apprenticeship.	The professional organisations define the entry requirements. If existing, candidates must first obtain a Federal PET Certificate in or an equivalent qualification such as years of professional experience.
Preparation	Students typically take part in a preparatory course even though participation is not mandatory and the degree is offered exclusively on the basis of the exam performance. Preparation courses are offered mainly by the Institute of Economic Promotion (*Wirtschaftsförderinstitut*). Private providers can also set up their own preparatory courses, with very little regulation.	Students typically take part in a preparatory course even though participation is not mandatory and the degree is offered exclusively on the basis of the exam performance. Only 3,2% of the examinees do not follow any formal preparatory courses. These are offered by the Chambers of Crafts and Commerce as well as by Vocational Schools, and a large variety of smaller private providers. These are largely unregulated, and their quality can be very variable. 75% of the examinees attend part-time preparatory courses at the Chambers and 22 % attend distance and online courses offered by private providers.	Students typically take part in a preparatory course for a national PET examination even though participation is in principle not mandatory and degrees are awarded exclusively on the basis of exam performance. Preparatory courses are much more diverse than professional college degree courses and they are largely unregulated. In the preparatory courses registered by BFS, only 7% of students followed a full-time course. Preparatory courses can take from a few months to two to three years. Course format reflects student demand, it often means weekend or evening classes and distance learning.

	Austria	Germany	Switzerland
Examination	The Meister exam consists of five mandatory modules of which the order is not fixed: 1. Practical (Part A can be replaced by LAP certification); 2. Oral (Part A can be replaced by LAP certification; 3. Written; 4. Instructor examination; 5. Entrepreneur examination.	The Meister exam consists of four parts: 1. Practical; 2. Theoretical; 3. + 4. are the same in all trades (Economic and legal knowledge + pedagogical skills).	The exam characteristics depend on the professional field. The exam set-up responds to rapidly changing labour market demand.
Finance	In 2010, the Meister examination fees were EUR 2 329. The costs of the preparatory courses varies widely. Financial support is available for candidates.	The Meister exam fees cost EUR 2 000-2 500 and financial support schemes are available. The costs of the preparatory courses varies widely.	The exam is subsidised by the Swiss Confederation. The expenses per person depend on the profession and on the subsidisation the institution offering the preparatory courses receive from the Canton.
Access to further higher education	Meisters are allowed to start Bachelors' programmes at *Fachhochschulen* and universities.	Since 2009, a "Meister title with distinction" renders Bachelor's studies at *Fachhochschulen* possible.	PET Diploma holders in their relevant profession may be entitled to enrol for a Bachelor's degree programme at *Fachhochschulen,* but allowing the access rests on the decision of each *Fachhochschule.*

Sources: OPET (Federal Office for Professional Education and Technology) (2011), "Skills beyond School in Switzerland: Country Background Report." OPET, Bern; Hippach-Schneider U., *et. al* (2012), "Skills beyond school in Germany: Country Background Report"; Schneeberger A., K. Schmid and A. Petanovitsch (2011), "Skills beyond School in Austria: Country Background Report", OECD Review of Postsecondary Vocational Education and Training.

Annex B: Comparison of three Swiss Advanced Federal PET Examinations with similar US vocational qualifications

	Switzerland	United States of America
Title	***KMU Finanzexperte mit eidgenössischem Diplom*** **(Financial expert of small to medium businesses with Advanced Federal PET Diploma)**	**Certified Financial Planner (CFP®) (also called Registered Financial Planner when registered with the Registered Financial Planner Institute)**
Exam title	*Höhere eidgenössische Fachprüfung für KMU Finanzexperten* (Advanced Federal PET Examinations for financial experts of small to medium businesses)	Financial Planner Certification examination
Regulation	- Regulated by the Federal Vocational Education Act (BBG), Ch. 3, Art. 28, 2. - The *Interessensgemeinschaft Ausbildung im Finanzbereich* (IAF) is the organising body for the whole of Switzerland.	- The programme is administered by the Certified Financial Planner Board of Standards Inc. which awards the Financial Planner Certification after fulfilment of the CFP Board's initial and ongoing certification requirements.
Prerequisite	- A Federal PET Certificate of Finance or any equivalent qualification + At least four years of work experience in the finance sector + Completion of the 10 required modules	- Bachelor's Degree and three years' work experience. Candidates have five years from the date of the Certification Exam to retroactively satisfy these two requirements.

	Switzerland	United States of America
Final Examination	1) Diploma thesis (two months, counts twice) 2) 45 min oral examination (Presentation of the diploma thesis + expert talk)	10 hours of exams (285 questions) And adherence to the CFP Board's code of ethics
Charges	CHF 4 500 (EUR 40 80) (Each required modules: CHF 450) (EUR 408).	USD 595 (EUR 418).
Objective	- Qualifies candidates to carry out the profession independently - Provides a clear standard	- Assesses the candidates' ability to apply their financial knowledge
Qualification	- Having in-depth knowledge in all areas of financial planning - Co-ordinating a team of financial experts for medium-sized companies - Being in the position to train others	- Being competent in all areas of financial planning - Being capable of providing financial planning unsupervised - Being eligible to use the CFP mark as a distinction of professional expertise
Validity	The qualification title is valid for the whole of the professional career	In order to maintain their certification status CFPs must pay an annual fee (USD 45) and attend 30 hours of approved continuing education every two years.

	Switzerland	United States of America
Title	***Spenglermeister mit eidgenössischem Diplom*** **(Master Plumber with Advanced Federal PET Diploma)**	**UPC Master Level Plumber**
Exam title	Advanced Federal PET Diploma for Plumbers	UPC Master Level Plumber Certification
Regulation	- Regulated by the Federal Vocational Education Act (BBG), Ch. 3, Art. 28, 2. - The *Schweizerisch-Liechtensteinischer Gebäudetechnikverband Suisstec* is the organising body for Switzerland and Liechtenstein. - The names of all Master Plumbers are published in a public register of the Federal Office for Professional Education and Technology.	*e.g.* The National Inspection Testing Certification (NITC) - Is a third-party ISO 9001:2008 certified provider of certification services to the piping industry in compliance with Federal and State ADA regulations. - Tests and certifies personnel in the plumbing, piping, and related piping industries. - Offers certifications (Journeyman/ Master titles, city, county, state requirements) - Specialises in Test Development and Test Administration.

	Switzerland	United States of America
Prerequisite	- Federal PET Certificate of Plumbing or any equivalent qualification + At least four years of professional experience + Completion of six required modules (1.5 years)	- Either at least six years experience OR a federal and state approved apprenticeship + two years of professional experience + NITC's Journeyman Plumber Certification or an equivalent
Final Examination	1) Four-hour written examination 2) Plumbing diploma thesis (counts twice) and 1 hour oral exam	- Open book examination (125 MCQ) based on the newest edition of the Uniform Plumbing Code by the International Association of Plumbing and Mechanical Officials
Charges	- Charges for the six modules depend on the provider.	- 2003: Initial cost USD 140 (EUR 98), cost of certification renewal USD 140 (EUR 98)
Objective	- Determines the candidates' ability to carry out the profession independently, to run their own company, and to train others	- Provides licensing agencies with information regarding professionals - Provides an independent appraisal of professional competency
Qualification	- Having the required skills and knowledge for specialist plumbing tasks - Being able to manage one's own business and to train others	- Being qualified in all areas of plumbing
Validity	The qualification title is valid for the whole of the professional career.	- The UPC Master Level Plumber Certification is valid for three years - Renewal requires an open-book exam (Online, by mail, or administered by a training agency or the employer)

	Switzerland	United States of America
Title	***Diplomierter Elektroinstallateur*** **(Electrician with Advanced Federal PET Diploma)**	**Master Electrician**
Exam title	Advanced Federal PET Diploma for Electricians	Master Level Electrician Examination
Regulation	- Regulated by the Federal Vocational Education Act (BBG), Ch. 3, Art. 28, 2. - The *Verband Schweizerischer Elektro-Installationsfirmen* is the organising body for the whole of Switzerland and implements the examinations in co-operation with the *Eidgenössischen*	- All states require licensure for electricians, most often in the form of a state exam. - Not all states offer a state-wide journeyman or master electrician licence and the licence may be limited to the county or city level only. - Licensing for journeyman/master electricians are controlled by local

	Switzerland	United States of America
	Starkstrominspektorat, the *Schweizerischen Vereinigung Beratender Ingenieure*, and the *Verein Interessensgemeinschaft Weiterbildung Elektro.*	building officials. - Journeyman apprenticeships take three to five years combing practical and classroom training. - Electricians offering their services directly to the public must hold a master licence. - For one's own business a special licence and professional experience are required. - Interstate agreements for reciprocal recognition of journeyman/master licensing exist.
Prerequisite	- Completion either of the Higher education Entrance Examination for Electrical Project Leaders OR of the Electrical Inspector Federal PET Diploma	- Most states require Master electricians to hold the Electrical Journeyman's Licence or a bachelor's degree in electrical engineering or a related field, and to have completed 6-7 years professional experience.
Final Examination	- Consists of eight subjects (four school-based, four on-site written and oral exams)	- Exam preparation is self-guided, either face-to-face or home study course - 5,5-hour Master Electrician open-book examination (50-80 questions)
Charges	- Depend on the provider *e.g.*: At the *Schweizerisch-Technische Fachschule Winterthur*, students pay CHF 5 400 (EUR 4 072) (Including the preparatory course)	The cost of preparatory programmes ranges from a few hundred dollars for home study materials to over a thousand dollars for an instructor-led course.
Objective	- Certifies the candidates' ablity to carry out the profession independently, to run their own company, and to train others	- Determines the candidates' ability to qualify for a state-licenced electrician - Increases the candidates' professional skills and social standing
Qualification	- Qualifies for higher positions, managing one's own business, and training others	- Being able to advance to positions such as supervisor, project manager, construction superintendent, electrical inspectors, owner of one's own contracting business
Validity	The title is valid for the whole of the remaining professional career.	- To maintain the licence, electricians are required to take tests on changes to the National Electrical Code and to complete safety programmes. - Master electricians must earn 16 hours of training each term.

Annex C: Ordinary least squares regression of earnings on general skills, ALL survey, holders of Swiss PET degree, 2003

Dependent variable = in annual earnings from main job

N=492

Regression specifications:		1	2	3	4	5
constant	Beta	10.978**	10.893**	10.818**	10.866**	10.975**
	t-statistic	62.94725	53.52826	54.69161	73.76782	47.67593
female	Beta	-0.7127**	-0.6741**	-0.6549**	-0.6545**	-0.702**
	t-statistic	-5.74295	-5.51186	-5.07674	-5.06187	-5.616
years of work experience	Beta	0.0209	0.0215	0.02	0.0091**	0.0212
	t-statistic	1.117647	1.143617	1.058201	1.978261	1.164835
years of work experience	Beta	-0.0004	-0.0004	-0.0003		-0.0004
	t-statistic	-1	-1	-0.75		-1
urban	Beta	0.1731	0.1962	0.1969	0.1977	0.1962
	t-statistic	1.436515	1.536413	1.551615	1.553024	1.600326
prose level 3	Beta	0.1696**				
ref. cat.: prose level 1-2	t-statistic	2.104218				
prose level 4-5	Beta	-0.0726				
ref. cat.: prose level 1-2	t-statistic	-0.41965				
document level 3	Beta		0.1661*			
ref. cat.: document level 1-2	t-statistic		1.73382			
document level 4-5	Beta		0.1595			
ref. cat.: document level 1-2	t-statistic		1.464646			
numeracy level 3	Beta			0.1363	0.1464*	
ref. cat.: numeracy level 1-2	t-statistic			1.419792	1.65237	
numeracy level 4-5	Beta			0.3039**	0.3174**	
ref. cat.: document level 1-2	t-statistic			2.108952	2.332109	

Dependent variable = in annual earnings from main job

N=492

Regression specifications:		1	2	3	4	5
problem solving level 3	Beta					0.106
ref. cat.: prob. solving level 1-2	t-statistic					0.934744
problem solving level 4-5	Beta					0.2547**
ref. cat.: prob. solving level 1-2	t-statistic					2.180651

Notes: ** significant at 5% level; * significant at 10% level

Dependent variable: in hourly learning from main job

N=477

Regression specifications:		1	2	3	4
constant	Beta	3.2626**	3.2066**	3.1611**	3.2966**
	t-statistic	40.73159	39.83354	35.1624	43.66358
female	Beta	-0.2327**	-0.2049**	-0.1991**	-0.2144**
	t-statistic	-5.06972	-3.94038	-4.14792	-4.32258
years of work experience	Beta	0.0021	0.0032	0.0013	0.0022
	t-statistic	0.235955	0.359551	0.156627	0.247191
years of work experience^2	Beta	0.0001	0.0001	0.0001	0.0001
	t-statistic	0.5	0.5	0.5	0.5
urban	Beta	0.0802**	0.0919**	0.0903**	0.0936**
	t-statistic	2.061697	2.203837	2.420912	2.52973
sector: market services	Beta	0.0709	0.0838	0.0741*	0.0742
ref.cat.: primary and secondary indst.	t-statistic	1.270609	1.526412	1.422265	1.410646
sector: public services	Beta	0.0446	0.0397	0.0242	0.0292
ref.cat.: primary and secondary indst.	t-statistic	0.706815	0.619345	0.389694	0.451314
isco: legislators, managers	Beta	0.2385**	0.2365**	0.2277**	0.2407**
ref.cat.: elementary occ.	t-statistic	3.767773	3.535127	3.429217	3.565926
isco: professionals	Beta	0.3294**	0.3106**	0.3096**	0.3224**
ref.cat.: elementary occ.	t-statistic	6.90566	6.45738	7.353919	6.272374
isco: technicians	Beta	0.1498**	0.1453**	0.1474**	0.142**
ref.cat.: elementary occ.	t-statistic	2.733577	2.618018	2.448505	2.491228
prose level 3	Beta	0.0994**			
ref. cat.: prose level 1-2	t-statistic	2.243792			
prose level 4-5	Beta	-0.0113			
ref. cat.: prose level 1-2	t-statistic	-0.18833			
document level 3	Beta		0.0967*		
ref. cat.: document level 1-2	t-statistic		1.841905		
document level 4-5	Beta		0.1266		
ref. cat.: document level 1-2	t-statistic		1.620999		
numeracy level 3	Beta			0.1344*	
ref. cat.: numeracy level 1-2	t-statistic			1.659259	

Dependent variable: in hourly learning from main job

N=477

Regression specifications:		1	2	3	4
numeracy level 4-5	Beta			0.1936**	
ref. cat.: document level 1-2	t-statistic			2.167973	
problem solving level 3	Beta				0.0075
ref. cat.: probl. solving level 1-2	t-statistic				0.151515
problem solving level 4-5	Beta				0.0757
ref. cat.: probl. solving level 1-2	t-statistic				0.554579

Notes: ** significant at 5% level; * significant at 10% level

Annex D: Overview of postsecondary professional colleges in selected OECD countries

		Austria	Denmark	Germany	Switzerland
Course content	National terms	VET colleges, *Kollegs*	Academies of professional higher education	*Fachschulen; Berufsakademien*	Professional colleges *höhere Fachschulen*
	Length of studies in years	5 (overlapping secondary and postsecondary), 3	2	2-3	>2
	Fields of study	Engineering and trade, business, management and service industries, agriculture and forestry, healthcare	Business and economics, information technology, design, health care	All except for mining and education	All
	Most popular occupational groups	n.a.	Private sector	Business and administration professionals, health professionals, legal, social and cultural professionals, information and communications technology professionals	Administrative and commercial managers and health professionals

		Austria	Denmark	Germany	Switzerland
	Workplace training	Mandatory in some fields (at least 4 weeks)	Mandatory 3-month placement		Mandatory in full-time programmes (minimum 20% of study time), corresponding field of work in part-time programmes
Student progression	Entry conditions	Completion of lower secondary education (7th year) and selection process set by the institution	Completion of upper secondary education or relevant vocational education and training, supplemented by adequate general secondary courses	Completion of vocational secondary education plus work experience	Completion of vocational secondary education plus work experience
	Transition to higher education	Possibility to enroll in *Fachhochschulen*	Additional one-year programmes available to obtain a professional bachelor in some fields	National/state-level regulation: free access to BA or MA(in UASs)	Institution level regulation
Governance	Ownership	Public-private	Mainly public but autonomous	Public-private	Mainly private
	Funding-sources	Public-private	Mainly public	Public-private	Mainly private

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Contents

Further reading

OECD (2010), *Learning for Jobs, OECD Reviews of Vocational Education and Training*, OECD publishing.

See also ***www.oecd.org/education/vet.***

For more information about OECD work on skills, see ***skills.oecd.org***.

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