

Rolf Dubs

An Appraisal of the Swiss Vocational Education and Training System

Commissioned by the Federal Office for Professional Education and Technology



Casagrande



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Professor em. Dr. Dres. h.c. Rolf Dubs
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Foreword by Joseph Deiss

Call for excellence in vocational education!

You are reading the first volume of a new series of publications on “vocational education research”. This collection is launched in answer to a real and urgent need. In fact, it is paradoxical that vocational education and training, the path chosen by two thirds of young people, is seen as a stepchild of educational research.

Solid scientific bases are indispensable to the monitoring of developments in vocational education and training, and to providing it with support and guidance. This new series aims to disseminate fundamental research and thus to enrich the practices and reflections of those involved in vocational education and training.

The study by Professor Rolf Dubs was particularly suitable for the launch of this collection.

The author is an expert in Swiss vocational education and training and has devoted much of his research to this field. In the present publication, Professor Dubs provides an overview of Swiss vocational education and training against the background of educational developments in Europe.

What are the advantages and risks inherent in our system? Does it offer the best chances of employment? The conclusions reached by Professor Dubs are encouraging, though he goes beyond a laudatory stocktaking by pinpointing where there is room for improvement. He underlines the need for those involved in vocational education to find compromises between often conflicting interests. Such compromises should not simply take the form of maintaining the status quo, as this would hold back the development of Swiss vocational education.

Professor Dubs insists that the necessary conditions are there for the success of our vocational education to continue. In this era of borders that are steadily being opened and labour market conditions that are rapidly

changing, we must commit ourselves to a strong vocational education system. I am convinced that this new publication series will contribute to achieving this goal.

Enjoy your reading!

A handwritten signature in black ink, appearing to read 'J. Deiss', with a stylized, cursive script.

Joseph Deiss

Federal Councillor

Head of the Federal Department of Economic Affairs

Preface

The main task of the present appraisal is to provide fundamental observations on basic vocational education in Switzerland, especially practical vocational training. The main questions touch on the position of basic education in international development. Such a focus is justified by growing concerns that the Swiss dual vocational education system and its strong emphasis on practical training might not be oriented enough towards the future to account for a trend in individual European countries towards vocational education that is purely school-based. Of particular importance here is the international recognition of Swiss Universities of Applied Sciences (UAS) for the pursuit of studies abroad and for the exercising of an economic activity.

Finding solutions is difficult for three reasons.

First, these questions have only been researched empirically, which makes scientific reasoning difficult.

Second, EU vocational education policy is not necessarily binding and is currently in a state of fluctuation. At the time the appraisal was completed, a basic vocational education credit system, which should improve professional mobility, had yet to be established since it is difficult to account for the special features of all EU members' vocational education systems in the design.

Third, there are many decisions that are political and rely heavily on the opinions of trade associations. If, for whatever reason, the latter take a negative view of innovative proposals from experts and interested parties to develop the vocational system, these will effectively become redundant regardless of their scientific and/or rational justification.

For this reason, the author decided not only to look at seven central questions, but also to conduct a wider and more exhaustive examination of the issues at stake with the aim of providing a more discriminating overview.

The findings of this appraisal of the Swiss vocational education system have been far from pessimistic. The dual (three-track) vocational education system has its own inherent advantages and creates good opportunities for youth employment. However, there is a clear need to make the system more flexible. All things considered, the findings on the development of Universities of Applied Sciences (UAS) are positive. Entry to UAS from the vocational school level is adequate. Furthermore, the adoption of the Bologna Declaration requirements and the *European Credit Transfer Sys-*

tem are steps in the right direction. Possible problems (e.g. dilution of the Bachelor title for UAS) can be solved, if the UAS now concentrate on improving the quality and the range of the services they provide in relation to a broader range of services they offer.

I would like to take this opportunity to thank Dr. Matthias Pilz, a researcher at the Institut für Wirtschaftspädagogik at the University of St. Gallen, for his extensive work on individual parts of this appraisal. The conclusions drawn by the author are entirely his own.

St. Gallen, 1st April 2004

Rolf Dubs

Executive summary

The Federal Office for Professional Education and Technology (OPET) commissioned an expert report to examine seven specific questions, which have been answered in Chapter 6. In addition, the OPET requested that the basic vocational education system and the development of the Universities of Applied Sciences (UAS) be presented in such a way that conclusions could be drawn on the international positioning of the Swiss vocational education system. For this reason, the introductory summary offers a broader approach.

Chapter One examines some criticisms levelled at the dual vocational education system in Switzerland.

1. It shows why a diversified educational system is essential (i.e. general/vocational education, universities/UAS). This chapter shows that merely increasing the number of young people going in for a Matura will not suffice as an educational means of improving the attractiveness of Switzerland as an economic location (Section 1.2.1).¹
2. The imbalance between the supply of and demand for apprenticeship places will continue to be a problem. Given the wide range of influences on demand and supply, this cannot be solved with a single policy instrument. There must be a range of measures, tailored to the specific fail-ures of the market (Section 1.2.2).
3. The varying demands of large, medium-sized and small companies for specific occupations are likely to increase further. Based on the gener-ally worded Federal Law on Vocational Education of 13 December 2002 (BBG), decrees can be designed to take those multiple demands into account (Section 1.2.3).
4. Most of the criticisms of the dual vocational education system, brought forward mainly by foreign experts, are too general and thus often do not withstand empirical scrutiny (Section 1.2.4).
5. Many weaknesses of the Swiss dual vocational education system are mentioned in the first OECD report on the Swiss education system. The report, however, generally pays hardly any regard to specific Swiss fea-tures, but it reflects the thinking of European experts who are influen-tial in matters of European vocational education policy matters (Section 1.2.5).

¹ Chapter sections provided in brackets.

6. Under current legislation and barring any harmonisation of the laws and regulations, Member States continue to be responsible for the realisation of EU objectives on basic vocational education (subsidiarity principle). Therefore, with a view to a possible future membership within the European Union, Switzerland will remain free to design its basic vocational education system (Section 1.2.6).

Chapter Two focuses on the effectiveness of the dual vocational education system, which is considered from three different perspectives: the transition process (transfer from statutory schooling to post-statutory education); a comparison of the dual with the purely academic vocational education system; and finally the level of satisfaction felt by apprentices with their education.

1. The transition from statutory schooling to post-statutory education generally appears to be a success. Most young people manage to go on to further education within two years after completing their statutory schooling. However, this situation is marred by two phenomena:

- A relatively high number of adolescents do not find direct access to post-statutory education and thus have to rely on interim solutions. However, thanks to a genuine desire for educational qualifications, many find a place in the vocational education sector within two years after leaving school, albeit not in the field of their chosen occupation. The discrepancy between the demand for and the supply of apprenticeship places therefore is not as severe as sometimes claimed – even though serious short-term imbalances remain.

The relatively high number of young people who, on completing their nine-year statutory education, have to rely on an interim solution of at least one year (systemic buffer function) leads to a greater demand for interim solutions (such as an extra year of statutory school, pre-apprenticeship etc.). This is far from efficient. It would be preferable to redirect the financial resources needed for such measures to those which aim to improve direct access to vocational education (e.g. systematic upgrading of the federal vocational certificate in accordance with Article 37 BBG).

- A critical factor for the relatively few school graduates who, having opted for an interim solution, do not go on to find an apprenticeship, is that their backgrounds are often an obstacle in the way to their success. For example, some lack the ambition to succeed, due to negative experiences at lower secondary school, where they were placed in lower competence groups which gave them a feeling of

being stigmatised (it should be noted that many end up in these classes purely by chance and not due to a discernible lack of ability), and some are put at a disadvantage by their social backgrounds because they come from immigrant families (e.g. from the Balkans, Turkey or Portugal), or even just because they are female. It is worrying that the negative preconceptions surrounding these groups further reduce their chances of obtaining apprenticeship places.

The solution does not lie mainly with vocational education policy. The real issues here are the integration and educational support of disadvantaged immigrants (whose number is significantly lower than generally claimed), as well as the problem of how best to structure lower secondary education. There is a clear and urgent need for reform in this area (Section 2.2).

2. Since demand and supply in the apprenticeship market are, in the short term at least, frequently in a disequilibrium, the problem of interim solutions for the phase directly after statutory schooling is undeniable. However, the number of disadvantaged school leavers is lower than normally claimed and solutions might be found through controlling measures. A comprehensive, nationwide bonus-incentive malus system and tax breaks for firms who train apprentices, though, appear equally inappropriate. The system envisaged in Article 60 BBG, featuring an associative vocational education fund which can be made compulsory, seems more promising. Furthermore, it could be useful to offer targeted subsidies that are based on clearly defined criteria and designed as a type of kick-start funding during lasting market imbalances (See Section 2.3).
3. There is no scientific proof that one vocational education system generally is superior to another. All depend on the criteria for evaluation that are used. For Switzerland, it is important that its dual system be put to effective use. However, in the current climate its general superiority cannot be taken for granted. The system is in need of reform, but its fundamental design is not called into question. The normative question on what the Swiss vocational education system is ultimately trying to achieve must be answered before embarking on such reforms. The answer to this question provides the criteria for an empirical analysis of the changing demands for individual vocational sectors.

The methodological basis for the present study is the “demand approach” and not the “social demand approach”, i.e. it advocates against a separation of vocational education policy from employment policy (Section 2.4).

4. The excellent quality of the Swiss dual vocational education system is borne out by the high level of satisfaction apprentices have expressed with regard to their education. Students at Matura schools and students at full-time vocational schools are less satisfied. Two aspects are crucial: on the one hand, the purely school-based route is seen in a more negative light than the dual system, and, on the other hand, school-based vocational education and in-firm training are poorly co-ordinated and there should be greater collaboration between these learning environments (Section 2.5).

Chapter 3 examines whether the new BBG creates the necessary prerequisites for improvements.

1. The generally worded Federal Law on Vocational Education of 13 December 2003 provides a solid basis for innovation in the basic vocational education system. One of its priorities is the further development of the dual system into a three-track vocational education system (training in a vocational school, in a firm or within a network of training firms, as well as through a wide range of training modules). Drawing on the expert model of the expert commission relative to the new law on vocational education, possible designs have been outlined for a more flexible three-track vocational education system specific to different occupations, sectors and professions (Section 3.2.1).
2. Since not all stakeholders are equally keen on innovation, the OPET must take on a stronger role of “innovator”. It must urgently adopt concise framework regulations on the concrete design of the education decrees and on examinations. Otherwise, with the general terms of the law, there is a danger that basic vocational education and vocational examinations will become too individualised, which in turn could lead to disparities in the quality of education, making it more difficult to compare different competence groups within basic education.
3. There are two priority areas. In view of the short-term imbalances in the apprenticeship market, the development of flexible networks among training firms should be promoted (perhaps using subsidies as a kind of kick-start funding). In addition, there should be no delay in applying the federal vocational certificate model if less academically gifted and socially disadvantaged lower secondary school graduates are to stand a better chance of obtaining educational qualifications. To achieve these objectives, employers’ associations and individual firms must be prepared to take an impartial approach to creating employment for the less academically minded (Section 3.2.2).

Chapter Four raises the question of the level of education and the employability of apprentices and offers some comparison of their education with that of their foreign peers.

1. From the point of view of professional mobility and in view of the many current social and economic policy challenges, the basic vocational education system must shift its focus away from promoting purely vocational skills. In spite of the fact that general education does not enjoy much popularity among apprentices, and in spite the reticence of many employers, general skills remain highly important for ensuring a satisfactory level of education among the younger generation. Therefore, the efforts of the OPET to improve general education should receive unconditional support (Section 4.2).
2. The assertion that the Swiss vocational education system produces people qualified for employment is borne out by the fact that youth unemployment in Switzerland is relatively low compared to other countries. Yet, the dilemma faced by the dual vocational education system should not be overlooked. The more specialised the curricula of vocational education, in line with the occupational composition of vacancies are, and the more firms orient their training along production-driven criteria, the better qualified apprentices are for employment. Yet, at the same time, this situation does not create the prerequisites for professional mobility, so that many employable apprentices have no real chances of advancing in their careers. A more generalised vocational education improves the students' mobility but reduces their chances on the labour market. This has consequences for social policy. As long as simple occupations remain in demand and young people continue to be trained in these areas in the interests of employability, the problem of unequal professional and social opportunities will continue to persist.
 - It has generally been observed that the interdependence of institutional conditions (vocational education system) and structural conditions (profession-specific) determines the value of educational qualifications in the labour market.
 - For the success of a vocational education system, it is paramount that these institutional and structural conditions can be harmonised as far as possible. A reasonable degree of specialisation in the dual or three-track vocational education system will contribute in the short term more to making apprentices employable. In the course of their vocational careers, the gap in terms of employability between those who chose the purely school-based route and those who opted for the dual system tends to close gradually. The rather narrow specialisation

in Switzerland could most probably be improved using elements from the expert model, thereby increasing mobility but not at the cost of employability (Section 4.3).

- An international comparison reveals that, formally at least, the Swiss basic vocational education system meets European standards. From a material perspective, however, there are educational differences, for example between the Swiss “polymechanics” and the German machine-tool and industrial mechanics. Yet, in terms of quality, the education they receive is by and large comparable (Section 4.4).
- Qualitatively, the examination-based entry requirements to Swiss UAS for the commercial professions, for example, are comparable. A study that revealed an inadequate performance of holders of a Swiss Matura on entry to the UAS should, for methodological reasons, not be generalised. A survey of UAS rectors reveals certain shortfalls particularly in the areas of mathematics and competence of mother tongue. Co-ordination must be improved between higher vocational colleges and UAS (Section 4.5).
- For the time being, there appears to be no need to introduce a bonus-malus system in Swiss basic vocational education. The construction of such a system would be extremely complex, and it probably will not be introduced by the European Union before 2010. Admittedly, a move in that direction by the EU would have a significant impact on the vocational education systems in individual member states. At this time, the focus of reforms in Switzerland should be on improving its own system rather than adapting it in line with uncertain European developments.
- None of the available findings calls into question the dual or three-track basic vocational education from a qualitative perspective. However, there are good reasons for advocating reform (see Chapter 3).

Chapter 5 looks at the development of UAS.

1. The processes of development and recognition of the Swiss UAS are described in detail. Thanks to comprehensive monitoring mechanisms (two peer reviews involving over 600 Swiss and foreign experts, and two formal inspections carried out by the FCUAS), it has been shown that the conversion of federally recognised colleges into UAS has been successful, even though quality still varies widely among individual universities and degree courses. Switzerland is probably the first country to have introduced such third level education reforms so swiftly and comprehensively, and under such strict monitoring. The criticisms that the

creation of UAS boils down to a mere change of name are therefore clearly unfounded. However, the strategy and management process is far from complete. There remains a great deal of work to be done, namely the development of a global strategy for all UAS in Switzerland (they are still highly fragmented), the delimitation of the autonomy of individual universities, as well as in the further streamlining of management. In terms of new public management, a number of measures still remain to be implemented (Sections 5.1 and 5.3).

2. The chances on the labour market of their graduates is decisive for the success of the UAS. Job market conditions, opportunities for career advancement and advertised job vacancies are therefore examined. These analyses reveal that employment opportunities are good (although they vary according to regions, areas of study and occasionally gender). In some cases, UAS graduates fare somewhat better than their peers from traditional universities. It is also clear, though, that prospects for certain UAS degree subjects are sensitive to changes in the macro-economic climate (Section 5.3).
3. The following general observations can be stated in relation to educational adequacy of UAS graduates (broadly defined as correspondence of the acquired skills and qualifications with labour market requirements):
 - In relation to labour supply, UAS graduates are at greater risk than those from traditional universities of having to accept a job for which they are overqualified. The difference is greater in French-speaking Switzerland than in the German-speaking area.
 - The risk of over-qualification is highest in the service sector. Most affected are students of economics and business administration, regardless of whether they have graduated from an UAS or a traditional university.
 - Students from specialist degree courses with a structured curriculum and a high degree of professionalisation (universities and UAS) tend to be employed more suitably than students from degree courses which do not have a clear professional profile.

These initial observations should not be overstated. There is still no authoritative evidence on educational adequacy, particularly in relation to the differences between graduates from traditional universities and UAS (Section 5.3).

4. Although the Bologna declaration is “merely” a political declaration of intent and is not legally binding, its principles have created a European standard. Therefore, to ensure international recognition of its UAS, Switzerland must comply strictly with such standards. Since Bologna

leaves considerable scope for nationally specific features, particularly with respect to course contents but also with respect to formal structures, there is no need to risk over-formalisation by unnecessarily hurried compliance. Given the postulates of the Bologna declaration, a rapid formal adaptation of Swiss UAS is nonetheless indispensable (Bachelor/Masters degree programmes, European Credit Transfer System). However, the main focus ought to be on the qualitative development of schools so that they can meet their expanded mandate. Three specific aspects should be taken into account.

- In response to the Bologna declaration and the development of higher colleges of education in other European countries, all Swiss UAS must offer few but high-quality Masters programmes as soon as possible. Care should be taken that the number of courses offered is restricted so as to ensure that the ever decreasing educational funding can be invested in a few targeted high-performance Masters programmes. The key to providing graduates with excellent qualifications is quality, not quantity. Furthermore, it will be impossible in the short term to find adequately qualified university teaching staff (solid research and practice-based credentials) to ensure that UAS Masters programmes will not merely be poor copies of those offered at traditional universities, but have a UAS-specific profile. Furthermore, the UAS still suffer from an almost complete lack of academic staff below the professorial level.

As the situation in the United States shows, high-quality Masters programmes develop best when they have to compete. Hence, UAS wishing to offer Masters programmes should have to apply to do so, and above all should have the right to select students according to their own additional criteria (Sections 5.5.4 and 5.4.7).

- For certain subjects, particularly technical courses, the duration of the Bachelor degree will have to be extended to three and a half years (three years of study and six months for the writing of the thesis). This is not motivated by the fact that an increasing number of German Universities of Applied Sciences are introducing four-year Bachelor degree courses. It is rather the graduate standards that count. If holders of these Bachelor degrees are to be capable of undertaking demanding tasks in research and development departments, it is essential that they have conducted longer-term applied research either in a laboratory as part of their studies or as part of a project within a firm. Theses also provide the best base from which to promote applied research and service provision in the UAS.

However, 3¹/₂-year degree courses should not become the rule. The duration of courses should be assessed on a case-by-case basis by determining whether each specialist subject area needs six months dedicated to writing a thesis. For example, there are no convincing arguments why this should be required in business studies and economics (Section 5.5.3)

- Some people fear that a Bachelor degree from a UAS will have lower status than the current diplomas offered by the engineering colleges (HTL) and by the colleges of business administration (HWV), as well as traditional university degrees. It is said that HTL and HWV graduates (with three years at a lower secondary school, three or four years vocational training and three years at a HTL or HWV) are well qualified and are immediately employable. University Bachelor degrees generally take one year less (two years at lower secondary school, four years at high school and a three-year degree course), but are placed on a par with the UAS system. Others fear that if traditional universities and UAS offer increasingly similar Bachelor degree courses, a merely “transitional Bachelor degree” will be created, especially since university degrees tend to be considered first and foremost as a stepping stone to a Masters degree, and less as a professional qualification per se.

For people who have undergone four years of vocational training, the UAS Bachelor degree course actually is one year longer than that of a traditional university. Whether the UAS Bachelor degree degenerates into a “mobility degree” does not depend on its formal characteristics but on its quality and profiling. If more and more holders of a Matura without any professional experience (e.g. without twelve months work experience prior to their studies) were to opt for an UAS degree course, there would be a real danger that the profile of the UAS Bachelor degree courses would be diminished and would become a mobility degree due to the inadequate professional and practice-related credentials of its graduates. It is also possible that the UAS will provide a more “academic” and less practically oriented education. Whether this happens depends entirely on how the individual UAS position themselves and on the quality of their courses. The more they reinforce their distinctiveness, the higher the value of their Bachelor degree. A deliberately distinctive profile is essential for an additional reason. In view of the emerging trend towards inflation of degrees, employers, when hiring staff, place more and more importance on the institution which awarded the degree rather than on the degree itself. The employability of UAS graduates, regardless of their

- formal structure, will remain high if their studies continue to be distinct and professionally-oriented (Section 5.5.5).
5. The draft legislation on the Universities of Applied Sciences of 5 December 2003 envisages the accreditation of all UAS. The body entrusted with this task remains to be appointed. The proposal is to hand over this responsibility not to the Centre of Accreditation and Quality Assurance for Swiss Universities (OAQ), but to the Federal Commission for Universities of Applied Sciences (FCUAS), which is placed in a small “Accreditation Section” within the OPET. From an administrative perspective, this is a simple solution, appointing a single federal body to take charge of the strategic management of UAS (strategic development and controlling). The two peer reviews have shown that this is feasible (Section 5.6).
 6. Finally, some pedagogical aspects need to be carefully considered.
 - It is important to define modules clearly. Modules are not only coherent, self-contained units (or “blocks” according to the concept of “individualisation” as set out in the new Federal Law on Vocational Education), they can also be structured in a variety of ways and accommodate different teaching methods. Above all, a schematic alignment of the module design according to the credit criterion is to be avoided at all costs.
 - Teaching at the UAS should be characterised by “learning that is oriented to practical application and research”, i.e. geared towards future professional skills. However, the existing polymorphic teaching forms should be upheld. Uniformity of teaching methods is rarely pedagogically effective.
 - Finally, the formalisation of all activities at UAS should not be pushed too far. The quality of a UAS does not depend on rigid, external design and process regulations, but on the identification and creativity of the teaching staff. For this reason, there must be sufficient freedom for individual research and teaching methods (Section 5.7).

Overall the following observations were made:

- The basic structure of the Swiss vocational education system does not need to be re-designed.
- The Swiss vocational education system is developing in the right direction.
- From a legal and material perspective, Switzerland has created the prerequisites for the Swiss vocational education system to keep pace with European developments. Furthermore, the specific advantages of the Swiss system can be maintained.
- It cannot be denied, however, that, in spite of those observations and even without changes in the European context there is a need for reform. Many of the innovations required (basic vocational education, apprenticeship market, development of Masters programmes in UAS, greater concentration of UAS study programmes) have partly conflicting objectives without clear-cut and scientifically correct solutions. Optimal compromise solutions must continue to be sought, notwithstanding vested interests and delaying tactics.
- Reforms can only become a reality if a federal office takes on the role of innovator. The sole body capable of doing this is the OPET. The key to its success is to be an initiator with a clearly defined strategy and to encourage all interested parties to seek consensus through new solutions. If this task is not entrusted to a federal body, the Swiss vocational education system is at great risk of becoming immobile, due to the many vested interests at stake (cantons, trade associations etc.).
- A decisive factor will be to combat effectively the emerging trend towards self-reinforcing formalism, which is largely driven by European Union initiatives, and the associated bureaucratisation of the entire educational system. Educational institutions can only enjoy success in the long term if, based on a clear regulatory framework, they are given sufficient freedom to develop as they see fit.
- The new Swiss law on vocational education takes this principle into account. Its possible effects, however, could be jeopardised by too much red tape created by the constant tension between the Confederation and the cantons and – a consequence thereof – the bureaucratisation of the education authorities in Switzerland.

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References

- General Guidelines for the Development of a Joint Activity Programme in the Field of Vocational Education of 26 July 1971 (OJ C of 12.8.1971).
- Federal Law on Vocational Education and Training of 13 December 2002.
- Federal Law on Universities of Applied Science of 6 October 1995.
- Council Resolution on the Quality and Attractiveness of Vocational Education and Training (OJ C 374 of 20.12.1994).
- European Ministers of Education: Joint Declaration of the European Ministers of Education Convened in Bologna on 19 June 1999 (Bologna Declaration).
- Expert panel: International Recognition of UAS Architecture Diplomas. Architectural Training in Swiss Universities of Applied Sciences. Framework curriculum of 27 August 2002.
- Universities of Applied Sciences 2002. FCUAS report on the creation of Swiss Universities of Applied Sciences of 17 June 2002.
- Universities of Applied Sciences 2003. Assessment of Applications for Authorisation Renewal. FCUAS report of 29 October 2003.
- EDA/EVD integration office: EU diplomas in Switzerland.
- Joint Quality Initiative 2003 (*Dublin Descriptors*).
- Conference of Swiss Universities of Applied Sciences: The design of graded degree programmes: Best Practice and Recommendations passed on 30 September 2003.
- Swiss Conference of Cantonal Education Ministers: Guidelines for the Implementation of the Bologna Declaration in Universities of Applied Sciences and Teacher Training Colleges of 5 December 2002.
- Swiss University Conference: Guidelines for the Coordinated Revision of Teaching at Swiss Universities in Accordance with the Bologna Process (Bologna Guidelines) of 4 December 2003.
- Swiss Yearbook of Labour Statistics.
- Federal Council Decree/EDK Directive on the Recognition of the Professional Baccalaureate for entry to University of 19 December 2003/4 March 2004.
- Federal Decree on the Creation and Management of Universities of Applied Sciences of 11 September 1996.
- Federal Decree on Vocational Education and Training of 19 November 2003.
- Yearbook of Labour Statistics.
- Second General System for the Recognition of Vocational Education and Training (Council Directive 92/51/EEC of 18 June 1992, OJ L 209 of 24 July 1992).

List of abbreviations

ABU-RLP	Framework curriculum for general education teaching in vocational schools for trade and industry
BBG	Federal Law on Vocational Education and Training of 12 th December 2002
BBI	Official Gazette of the Swiss Confederation
BbS-Vo	Decree on vocational schools (Niedersachsen, Germany)
BBV	Decree on Vocational Education of 19 th November 2003
BIBB	Federal Institute for Vocational Education and Training (Germany)
BLK	Bund-Länder Committee for Educational Planning and Research Promotion (Germany)
BMBF	Federal Ministry for Education and Research (Germany)
CUS	Swiss University Conference
ECVT	European Credit Transfer in Vocational Education and Training
EDK	Swiss Conference of Cantonal Ministers of Education
ETH	Federal Institutes of Technology
EU	European Union
EURO-BAC	European Baccalaureate
FCUAS	Federal Commission of Universities of Applied Sciences
F/HR	EDK Council of Swiss Universities of Applied Sciences
FHSG	Federal Law on Universities of Applied Sciences of 6 th October 1995
FHSV	Federal Decree on the Creation and Management of Universities of Applied Sciences of 11 th September 1996
HTL	Höhere Technische Lehranstalt (Swiss engineering colleges)
HWV	Höhere Wirtschafts- und Verwaltungsschulen (Swiss business administration colleges)
KFH	Swiss Conference of Universities of Applied Sciences
KTI/CTI	Innovation Promotion Agency
NVQ	National Vocational Qualifications
OAQ	Centre of Accreditation and Quality Assurance of the Swiss Universities
OECD	Organization for Economic Cooperation and Development
OPET	Federal Office for Professional Education and Technology
PISA	Programme for International Student Assessment
SECO	State Secretariat for Economic Affairs
SFSO	Swiss Federal Statistical Office
TREE	Transition from Education to Employment
UEAPME	European Association of Craft, Small and Medium-sized Enterprises
VET	Vocational Education and Training

Chapter 1:

The present Swiss vocational education system – key points

1.1 Background

The last few years have been marked by a growing debate on whether the Swiss vocational education system or parts thereof have become outdated. Some arguments call into question education policy, while others incite the polarisation between advocates of the present dual system (especially employer and employee associations, as well as politicians) who are in the majority and innovators who would like to see more fundamental reforms. At a first glance, many of the criticisms are very convincing. However, on closer inspection it is clear that they are often based on conclusions drawn from international comparisons, and thus ignore the cultural and economic features of the Swiss vocational education system. Furthermore, foreign observers tend to have little knowledge of how it works in practice, and therefore their proposals give scant regard to the features of this system. This argument is also supported by parties in Switzerland who believe that in this era of greater integration and globalisation, the days of upholding Swiss idiosyncrasies are long gone. Since it can be expected that these positions will become more polarised in the near future and by way of an introduction, we have condensed the arguments into a series of key headings.

1.2 Criticisms levelled at the Swiss vocational education system – key headings

1.2.1 Too few students at Matura schools

In comparison with other countries, of all students at the upper secondary level in Switzerland the share of young people studying for a Matura is low (see Table 1.1).

Table 1.1
Share of young people studying at Matura schools in relation to all students at the higher secondary education level

Year	Share of young people studying at Matura schools in Switzerland	OECD countries
2002	20.9 %	43–74 %
Source: Swiss Federal Statistical Office: educational qualifications, p. 11		

In the light of this situation, some believe that more young people should be encouraged to study at Matura schools. Otherwise, there is a risk that in the future Switzerland would lack the human capital to enable it to cope with social, technological and economic developments.

The underlying question here is, whether a school system should continue to maintain an upper secondary education level with two branches – general or vocational education. Alternatively, should Switzerland move towards a standardised system, for example full-time vocational schools or one similar to the American high-school model? Finally, influenced by some EU countries like France and Italy, a growing number of people are in favour of full-time vocational schools with easier or direct access to universities.

Section 2.2 (see Chapter 2) discusses whether this change would be beneficial for the improvement of the quality of Swiss vocational education and training. The following viewpoints are to be expected. First, the share of Matura students of the total number of students at the upper secondary level is not an indicator of the quality of education in a country or the aptitudes of its young people. This can only be proven by the performance of Matura students from different schools (cf. also for Switzerland, Lusti 1981) or by the varying levels of achievement among Matura

students in the various German Bundesländer (e.g. as documented in a study by the University of St Gallen, 1990).

Second, the decision depends on normative targets, such as how far a school system should be oriented towards employment (i.e. demand). Should it be designed to meet the objectives of an autonomous education policy (social demand approach, i.e. dissociating the aims of an education system from economic utilization and the employment structure)? The more weight given to a system oriented towards employment, the greater the justification for having separate general and vocational education branches, particularly since graduates of the dual education system stand a better chance of finding employment. However, it should be noted that in the course of time this balance is redressed.

Third, a more decisive yet often overlooked factor is the design of upper higher secondary education curricula. When both branches show little readiness to change the design of their curricula, which unfortunately tends to be the case in Switzerland, the calls for amalgamating the two branches grow. Whether a greater number of Matura students would create a more highly developed human capital irrespective of the present design of the education system is doubtful, even if we assume that the employment-oriented aspects of this system are retained in the interest of national economic growth.

Fourth, advocates of the development of the general education branch opting for an increase in the number of young people studying for a Matura, overlook the existence of full-time vocational schools which offer a professional baccalaureate and greater permeability thanks to easier university admission based on entrance examinations (decree of the Federal Council/EDK directive on the recognition of professional baccalaureates for admission to third level education of 19 December 2003/4 March 2004). This means that young people who have chosen the route of apprenticeship and vocational qualification (professional baccalaureate) have the opportunity to go on to further education if they wish. It is now easier for graduates of the dual system to transfer to a third level institution, thereby offering them greater opportunities for their personal development.

Fifth, there are systematic differences between countries depending on their school system. In countries with an independent, dual vocational education system, many jobs requiring intermediate qualification levels are held by highly qualified professionals, many of whom have undergone advanced vocational training. In countries that do not have this intermediate qualification level, such jobs are held by graduates from traditional universities and vocational colleges (called Universities of Applied Sciences

in Switzerland). As a result, countries without a dual system inevitably have a higher share of upper secondary school graduates. For this reason, the share of Matura students in Switzerland is not as important as in countries without a dual vocational education system. A significant advantage of the dual system is that polarisation between the highest and lowest qualified population groups can be avoided by and large, and the risk of people holding jobs for which they are over-qualified is smaller.

Finally, the competitiveness of firms does not depend on young people having a university qualification. It is much more decisive that they have good professional qualifications, which can be applied flexibly on the job. The increase in the number of Matura and university students, a constant objective of education policy, not only weakens the dual vocational education system but is also detrimental to the third level education system, since overcrowding is not advantageous for excellence in education and research (Backes-Gellner, 2003). The introduction of Bachelor degrees would not solve this problem. The more students a university must admit and the greater its efforts to ensure that the content of its Bachelor degree courses relates to the needs of the labour market, the further away it moves from its central mission of promoting an intellectual elite, even if it is forced to admit as many Masters students as possible for reasons policy and/or prestige. If education policy is to make Switzerland a more attractive economic location, one of its aims cannot be a general increase in the number of students at Matura schools and universities. Instead, it should focus on establishing a differentiated third level education system. The creation of Universities of Applied Sciences in Switzerland is an important step in this direction insofar as they develop their own distinct profile and do not aspire to be mere copies of traditional universities.

There is one important **requirement of education policy** in Switzerland: the share of Matura students should not become a decisive indicator of the development of the Swiss education system. In the long term, a differentiated general and vocational education system as well as a differentiated third level education system comprising traditional universities and UAS with their own distinct profiles and sufficient permeability would help to make Switzerland a more attractive economic location.

1.2.2 Disequilibrium in the apprenticeship market

1.2.2.1 General observations

Statistics gathered over the last few years show that, depending on occupation, sector and region, there is an imbalance between supply and demand in the apprenticeship market. This imbalance tends to be re-dressed somewhat in the longer term. However, the current situation continues to cause problems.

On the **demand side** the following factors should be given general consideration:

1. In the last thirty years, the idea has gained ground that schools in addition to their traditional role of educating young people should contribute to the social equality of a country. The key word here is “equal opportunities”. Unfortunately, many people still believe that the only solution to the inequality problem is increasing the number of Matura and university students. As a result of this, and spurred on by their parents’ attitudes, more young people are choosing to attend Matura schools in the hope of better professional and development opportunities. The lack of permeability of the school system that persisted until recently, has reinforced this trend, because this educational pathway purportedly offers students a greater range of employment options than the traditional apprenticeship system. With the creation of the professional baccalaureate and easier access to university for dual vocational education students, it is hoped that this argument will lose ground.
2. Another factor in this trend is that the general public consider manual and technical occupations as socially less prestigious than a university education. This situation was aggravated in the past by labour shortages when there was a greater wage disparity between the skilled workforce and academically educated employees.
3. Over the years, the rising number of students attending Matura schools has led to labour shortages in many occupations which forced employers to take on less capable students. As a result, the differences between better and weaker apprentices grew, which in turn led to many capable young people finding themselves in underchallenging jobs. The apprenticeship option became less popular, especially among better students. Consequently, teaching staff at the lower secondary level increasingly advised students to continue their education at upper secondary schools.

4. There was a downward trend in the demand for apprenticeship positions, and for two reasons. First, some people that apprentices face greater pressure than their peers studying at Matura schools. Second, it was often said that the working conditions in firms which train apprentices were poor. However, it should be noted that these two factors are not applicable for Switzerland (except for slow learners/weak students; see Chapter 3, Section 2.2.3).

The following factors have a general bearing on the **supply side** of the market:

1. There are the economic reasons: structural changes (disappearance of traditional occupations and the appearance of new ones), rise in productivity (the need for skilled labour is falling, therefore there are fewer apprenticeship places on offer), “tertiarisation” of the economy (shifting jobs from the second to the tertiary sector), as well as comprehensive measures of streamlining and staff cutting (fewer staff often lead to fewer apprenticeship positions since firms cannot afford the time to train apprentices).
2. The number of apprenticeships offered by firms is falling because they can neither afford the time nor the costs associated with this training. Furthermore, firms consider the related statutory requirements as complex and costly (more exacting training conditions, more administrative duties), although this aspect requires a more differentiated consideration as there are other positive aspects to be taken into consideration (See Chapter 1, Section 1.2.2.2.3).
3. Certain sectors of the economy and small and medium-sized companies in particular, which cannot be highly selective, decide against taking on apprentices as they do not want to be burdened with unsuitable, unmotivated apprentices who would find it difficult to integrate in the workplace. Here too, prejudices (particularly against foreign apprentices) often give rise to faulty judgments.
4. Specialist firms no longer take on apprentices because they cannot offer the necessary exhaustive training, or because the current training system is too inflexible (the Federal Law on Vocational Education and Training of 13 December 2002 should rectify this), or because the practical demands of an occupation no longer correspond with the relevant training requirements.
5. There is a tendency in some economic sectors to favour people with an academic background who gained practical experience during work placements, internships or special training courses over those who opted

for the vocational training route. This is particularly true for the commercial and IT sectors.

1.2.2.2 Special aspects of apprenticeship vacancies

Empirical studies (cf. Geser 1999; Schweri, Mühlemann et al. 2003) clearly show that distinctions should be made for each of the generalised common assertions on apprenticeship positions (see above). We shall now examine the most important aspects of these arguments. Their importance, particularly in relation to interventions by the state with the purpose of influencing the supply side, should not be underestimated.

1.2.2.2.1 *Young people without an apprenticeship position (imbalance within the market)*

Two issues regularly give the public cause for concern: the decline in apprenticeship vacancies (approx. 15.1 % between 1985 and 2001), which does not affect all occupations equally (see Swiss Yearbook of Labour Statistics, 2003, 676); and the current short-term imbalance in the apprenticeship market, which will become less pronounced in the longer run (Section 2.2.3, Chapter 2).

Both these aspects should be interpreted with caution:

1. Apprenticeship vacancies or lack thereof vary widely from one region to another. In urban areas, there is a market shortage of jobs that are particularly coveted by the young, while in rural areas, the market is in a balance.
2. The imbalance between the supply of and demand for apprenticeship positions is a growing problem. The most sought-after occupations (such as jobs in the commercial and IT sectors or design-related occupations) offer too few apprenticeships, while the less popular occupations (in particular certain occupations in the construction and food industries) cannot fill their apprenticeship vacancies.
3. Young people find it increasingly difficult to find an apprenticeship position if they attend lower secondary schools with lower requirement levels (e.g. Realschule), or if they are come from foreign countries (especially, if they are from Macedonia, Serbia-Montenegro, Turkey or Africa). Carefully collected and insightful statistics from the canton of

Zurich (Canton of Zurich directorate of education, 2003) show that it is a situation of an extremely polarised situation. Only 2 % of Swiss citizens who have attended lower secondary schools with high requirement levels, do not find an apprenticeship position. For young non-Swiss males who have attended schools with low requirement levels or special classes, the share was 26 %.

4. The tertiarisation of the economy will only serve to enhance the imbalance in the apprenticeship market. The firms which traditionally have low numbers of apprentices tend to belong to the growing sectors of the Swiss economy, while the structural importance of those with a high number of apprentices is in decline (Sheldon 1998). Since apprenticeship positions sought by young people today tend to be in the growing sectors (e.g. IT), this situation will continue to get worse.
5. The supply of apprenticeship positions will shrink if firms continue to hold on to the idea that the future of basic vocational training depends on a purely academic education. This conviction is based on the following arguments:
 - Increasing specialisation by individual firms make it impossible to offer a comprehensive vocational training for apprentices.
 - The burden associated with training apprentices is too great for firms to carry. The offer of placements for apprentices from full time vocational schools alleviates some of this pressure.Initial data are provided in Table 1.4.
6. Finally, it should be stated once again that the short-term-situation is not of particular importance. There are marked differences in the numbers between the first and the second year after completion of compulsory education (for more details see Section 2.2.2, Chapter 2).

1.2.2.2.2 *Distribution of apprenticeship vacancies among firms*

Table 1.2 compares firms that train apprentices to those which do not.

Table 1.2
Distribution of apprenticeship training across firms (2000)

	Takes on apprentices	Does not take on apprentices
All firms in Switzerland	29.1 %	70.9 %
Firms with 2–9 employees	23.8 %	76.2 %
Firms with 10–49 employees	40.4 %	59.6 %
Firms with 50–99 employees	57.5 %	42.5 %
Firms with more than 100 employees	66.9 %	33.1 %
<p>N.B.: The statistical data vary according to the method of collecting information (e.g. one-person companies, subsidiaries). The much-cited paltry 18 % of firms that train apprentices is based on the overall number of firms (including firms of one person where it is almost impossible to take on apprentices) and is in no way significant.</p> <p>Source: Wolter, Mühlemann & Schweri 2004.</p>		

These figures also require interpretation:

1. At first glance, it would appear that a large number of small and medium-sized firms no longer train apprentices. The reason for this is that compared to large firms, they can no longer find young people who meet their (often traditional) requirements in terms of motivation, willingness to work, abilities, and personality.
2. It is also plausible that small firms in particular find that training apprentices places them under excessive pressure (see Table 1.2).
3. An analysis by Geser (1999) shows that no significant conclusions can be drawn from the overall values listed in Table 1.2. If we compare the percentage share of apprentices in the total workforce of the firm and factor in the size of the firm, occupation and the economic sector, we get quite a different picture (see Table 1.3).

Table 1.3

Apprentices as a percentage share of a firm's workforce in relation to the total workforce of the firm, occupation and economic sector

Size of firm (Number of employees)	Economic sector					
	Industry		Construction		Services	
	Skilled/technical	Commercially/service-oriented	Skilled/technical	Commercially/service-oriented	Skilled/technical	Commercially/service-oriented
up to 10	5.0	1.2	12.1	0.0	3.9	7.6
11–20	6.2	0.9	13.0	0.8	3.7	5.8
21–50	3.8	0.9	8.5	0.5	3.9	3.9
51–100	2.6	1.2	5.8	0.5	1.6	4.3
101–200	2.6	1.5	5.4	0.5	1.3	2.4
201–500	2.8	1.2	6.0	1.1	0.7	2.5
501–1000	3.1	1.0	9.0	0.4	0.1	3.0
over 1000	3.7	0.6	–	–	0.4	3.0

Source: Geser (1999), p. 17

These results seem somewhat surprising if compared to the general assumptions with respect to apprenticeships:

- These data clearly illustrate why debates on education policy for the most part still cater for solutions that take account of commercial needs. Since small firms continue to train a large number of apprentices, they and their representative associations demand that their needs are given due consideration.
- The fact that small and medium-sized firms take on more apprentices may have two reasons. On the one hand, it is easier for a small firm to provide broad-based in-house training with a focus on commercial aspects. On the other hand, motives that have been rationally instrumentalised in focussing on the management of the firm, may play a central role. In small and medium-sized companies, apprentices can be directly used in a supporting role (“the shop owner needs an apprentice so that her business can remain open in her absence” [Geser 1999, 12]) and can offer greater financial benefits.

The **conclusion** is clear:

If the dual vocational education system is to remain viable on the long run, the training requirements for individual occupations must cease to be dictated largely by small- and medium-sized firms. Otherwise, the readiness of large firms with higher occupational requirements to take on apprentices will continue to decline. This does not mean that they the requirements should be designed to meet the needs of large firms exclusively, because the Swiss economy continues to be characterised by its high number of small and medium-sized firms, and the latter offering more apprenticeship positions in comparison to larger firms. In terms of discussions on the future design of the dual vocational education system in Switzerland, this area of conflict is likely to be one of the most difficult problems to solve.

1.2.2.2.3 *The readiness of firms to take on apprentices*

Several offices have already addressed the problem of the greater reluctance on impart of firms to take on apprentices. Geser (1999) conducted a survey of firms that do not train apprentices and their reasons for doing so. On the assumption that there would be cultural differences, he classified the results according to linguistic regions (See Table 1.4).

Table 1.4

Reasons for refusal to train apprentices: percentage share of firms offering no apprenticeships according to linguistic regions

Reasons	Linguistic region		
	German	French	Italian
High costs	5.1	5.5	6.1
Lack of time	25.5	28.5	22.5
Unsuitability (firm)	57.5	44.2	49.0
No suitable applicants	7.4	19.4	20.4
Source: Geser (1999), p. 11			

Based on these data, two conclusions can be drawn:

- It is striking that in the French and Italian parts of Switzerland there is a larger number of firms that do not offer apprenticeship positions due to a lack of suitable applicants. One possible reason is the higher share of Matura students in these regions. It is then fair to assume that the continual – and mostly undifferentiated – call for an increase in the share of Matura students is detrimental to the vocational education system in terms of apprenticeship market demand.
- There is also a significant number of firms which believe that they are unsuitable for training apprentices. It is not clear to what extent this is an attempt on their part to avoid further commitment.

There is a further **conclusion**: If so many firms believe that they are unsuitable for training apprentices, then the dual system should be designed differently (See Section 3.2.1, Chapter 3).

Schweri, Mühlemann et al. (2003) have already looked at the idea of setting up firms that will specialise in training apprentices. Their study revealed the following:

- According to qualitative surveys of firms to investigate why they operate their own in-house apprentice training system, the first reason cited is the social importance. Reasons related to the business itself, particularly those which touch on the adaptability of the firm (removing the risk of qualified labour shortages, increasing the attractiveness of the employer status, or greater ability to adapt to market changes) tend to be cited last. Like most surveys, socially acceptable reasons are given more often than the real reasons.
- When questioned on the importance of training apprentices for the firm itself, the first reason given tends to ensure the supply of new staff (guaranteeing the labour force supply in the sector and region, acquiring staff in times of a qualified labour shortage, and providing the young work force with the qualifications which satisfy specific in-house requirements). The last reasons to be given are once again oriented to business – saving on unskilled and skilled labour by employing apprentices, saving on the costs of recruitment and of training new staff. Based on the survey findings, it appears that firms either attribute little importance to the cost-benefit dimension of training apprentices or they are reluctant to offer such reasons, as these are more difficult to justify on the

social level. A comparison of these results with the cost-benefit ratio of apprenticeship training shows that economic considerations are not one of the prime motives given by firms which train apprentices. What is significant is the fact that the reason given and its link to the cost-benefit ratio create sizeable variations in the strategic direction of firms' apprenticeship policies. **These strategies** can be **oriented to production**, i.e. the apprentices are employed productively during their training period, whereby the given firm enjoys low training costs and high returns on the services provided by them. This strategy works to the benefit of a firm, if much of the work can be done more cheaply by apprentices than by other members of staff. As a result, these firms take on a high number of apprentices, often surplus to their requirements, and create many new positions over time (creating a high training intensity) since new apprentices are cheaper than keeping on trained apprentices as skilled labour. The strategies can be **oriented to investment**, whereby individual firms invest more in their apprentices than the latter return. This is particularly true if a firm retains the apprentices that it trained as skilled labour. Here, firms only create as many apprenticeship positions as are needed (weak training intensity). Sectors that deploy this strategy offer a low number of apprenticeships.

The choice of strategy depends on the special features of the firm and its framework conditions. Firms for example, which are subject to stiff competition in the labour market and belong to weak, poorly organised associations, tend to choose a strategy oriented to production because it is likely that their trained apprentices will be poached by another firm. A firm that trains apprentices in highly specialised occupations will tend to take a more investment-oriented approach to ensure that the apprentices stay on after they have completed their training, and because the relevant sectoral associations accord more importance to vocational training.

These analyses by Schweri, Mühlemann et al. (2003) allow us to arrive at the following **conclusions** which have important implications for education policy:

- Apprenticeship strategies, which ultimately depend on the associated cost-benefit structures, differ according to the special features and framework conditions of each firm, and have a direct bearing on the number of apprenticeship positions they offer. Based on their appreciation of benefits, each firm chooses the strategy which works to its best advantage.

- Both strategies are important for increasing apprenticeship supply. The production-oriented strategy is necessary to ensure that the majority of school graduates find an apprenticeship position. Furthermore, a vocational qualification no longer automatically guarantees that people can find a job in their chosen occupation, because firms now tend not to take on people with learning difficulties. This gives rise to a situation where the vocational education system alone is unable to guarantee that young people with learning difficulties find an occupation. The investment-oriented strategy, which is chosen mainly by firms which require a highly skilled workforce or are themselves highly specialised, is of equal importance. It ensures that for good students the apprenticeship route still a satisfactory alternative to education at a Matura school.
- A national vocational education policy should not favour one strategy over another, for example by subsidising firms and trades which take an investment-oriented approach to training. It is quite clear that such a selective procedure would require tough policy decisions that are difficult to enforce.

1.2.2.2.4 *The readiness of foreign firms to train apprentices*

Regrettably, foreign firms and senior management show only little understanding for Swiss idiosyncrasies. This is confirmed by Geser (1999) who compared the number of apprentices in both Swiss and foreign firms (see Table 1.5).

Table 1.5
**Apprentices as a percentage share of a firm's workforce
according to nationality and number of employees**

Owners	Number of employees		
	Up to 30 employees	31–200 employees	Over 200 employees
Swiss firms	8	5.3	4.1
Foreign subsidiaries	0.9	2.4	3.7
Source: Geser (1999), p. 6			

When these data are classified according to sectors it appears that very few apprentices are taken on by foreign firms in the banking, insurance and wholesale sectors. This is particularly problematic for commercial apprenticeships. More apprenticeship positions were offered in personal services, in the retail trade, and in the hotel and restaurant industries, although these lag behind those offered by Swiss firms in the same sectors. The only foreign firms to take on more apprentices than their Swiss counterparts are in the IT sector. The same observations were made for Germany.

1.2.2.2.5 Share of apprentices in firms with rising, stagnating and declining turnover

Table 1.6 summarises the effects of the turnover of firms according to the number of employees and economic sectors on the percentage share of apprentices in the total workforce.

Table 1.6
**Percentage share of apprentices of the total work force
of firms according to the number of employees,
economic sector and financial turnover**

Change in firm's turnover (1995–1997)	Number of employees					
	Up to 30 employees		31–200 employees		over 200 employees	
	Industry	Services	Industry	Services	Industry	Services
Rising	3.9	6.9	3.6	4.4	3.8	2.5
Stable	6.2	10.3	4.3	6.5	3.5	3.4
Declining	5.7	8.3	3.0	6.4	3.3	4.4
Source: Geser (1999), p. 37						

These data show a disproportionately high share of apprentices in small and medium-sized firms. Due to their stagnating financial turnover, their future survival appears to be less than promising. The economic sectors that are particularly affected are the building industry, retail, and the hotel and catering industry, which often pursue a strategy oriented to production. The problem here is that too many apprentices are being trained for a steadily decreasing number of jobs. As a result, many have to re-train soon after they have acquired their initial vocational qualifications. To

counter this problem, there should be greater flexibility in the dual vocational education system.

1.2.2.2.6 Cyclical fluctuations in apprenticeship positions

The issue of whether the supply side of the apprenticeship market is subject to cyclical fluctuations (greater supply in a booming economy, lower supply in a economic downturn) is still subject to debate. An earlier study (Dubs 1976), which is still relevant today, showed a moderate link between economic cycles and the total number of agreed apprenticeship contracts. To assess trend within the apprenticeship market and to develop measures for the supply side, ideal types of supply were classified into five groups (see Table 1.7).

Table 1.7
**Ideal types of occupational groups for an increase
in apprenticeship contracts**

Group 1: Greater number of apprenticeships on offer during recessions in a group that is in long-term decline. Here, young people are forced to accept an apprenticeship vacancy due to a shortage of apprenticeship in their chosen occupation.
Group 2: Permanent rise in apprenticeship positions. This concerns occupations in the growth sectors of the economy.
Group 3: Growing number of apprenticeships on offer until the first signs of recession when the number falls. Cyclical fluctuations appear to have an immediate effect on this group.
Group 4: Stagnating or constantly falling number of apprenticeships on offer. This group is undergoing structural changes.
Group 5: Supply trends that cannot be interpreted.

In the context of government measures to promote apprenticeships (resolutions, task forces) this classification is significant because it highlights their limitations. The first group is crucial for social policy as people are forced to choose an apprenticeship position which does not correspond to their aptitudes or chosen occupation. If these occupations are defined too narrowly, it then becomes difficult for such students to re-train in the event of economic changes. Therefore, the design of a vocational education system should define occupations in broader terms (e.g. merging occupations in the food industry that are related to the production of food with options

for specialisation). Group 3 is also critical. Due to its pro-cyclical reaction in terms of offering apprenticeship positions particularly at the beginning of a trainee's career, this group creates either a surplus or a shortage, both of which are linked to youth unemployment. It is basically impossible to implement a policy instrument here. Group 4 is particularly problematic, as it concerns occupations in a sector undergoing rapid structural changes. Many of these occupations are very popular with young people, but quickly lose their importance. A typical example are occupations in the IT sector. It has become increasingly difficult to set down defined occupational requirements in this sector due its specialised nature.

A recent analysis by Utinger (2003) based on current economic trends also confirms the weak influence of cyclical fluctuations on the number of apprenticeship positions on offer. He compared shifts in overall employment with changes in the number of apprenticeship positions for the 1985–2001 period. This study revealed sizeable differences among the cantons (e.g. employment in the canton of Zug went up by 41.7 % while the number of apprentices fell by roughly 14 %). In the larger cantons there is no discernible general trend, but there are significant variations between sectors and occupations. All in all, this does not indicate a direct cyclical link between employment and the offer of apprenticeship positions.

To summarise, the imbalances in the apprenticeship market is set to still pose a problem for the Swiss vocational education system in the foreseeable future. Therefore, it is important to verify whether a more flexible system (see Section 3.2.2, Chapter 3) and/or policy measures (see Section 2.3, Chapter 2) could redress the balance.

1.2.2.2.7 A more comprehensive view

By looking more closely at the cost-benefit dimension, Mühlemann, Schweri & Wolter (2004) and Wolter, Mühlemeann & Schweri (2003) could provide more differentiated explanations than Geser (1999) as to why companies no longer train apprentices.

First, they drew up a list of the ten most important reasons behind a company's decision not to offer apprenticeship positions. These are presented in Figure 1.8.

Then, having first analysed the average cost-benefits incurred by companies with apprentices, they estimated cost-benefits for those companies with no apprentices. The results are set out in Figure 1.9.

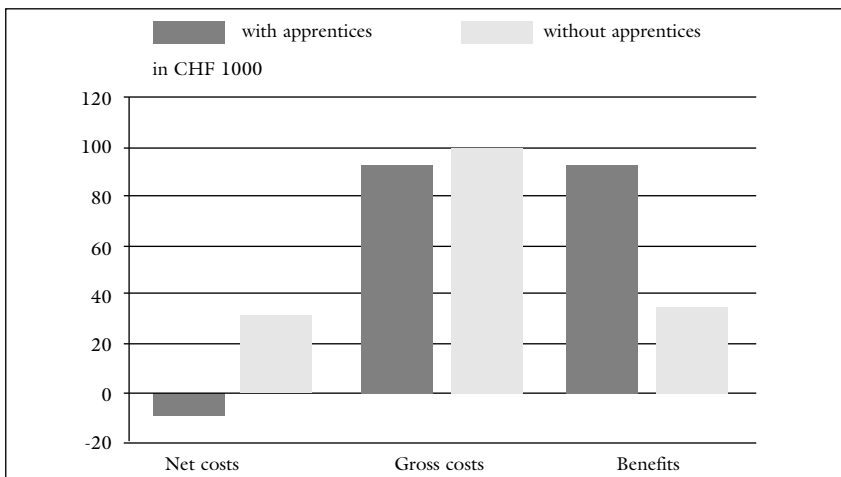
Table 1.8

Ten most important reasons why companies do not take on apprentices

Reasons	Strongly agree in % (answer categories 1 & 2)	Mean value (1 = very important, 3 = unimportant)
1. Not enough time to train apprentices	50 %	2.74
2. Company is too specialised and thus unable to cover the statutory training content	43 %	3.03
3. Workforce requirements are already met through the further training of existing personnel	39 %	3.05
4. Benefits of training one's own apprentices too low	29 %	3.38
5. Training is too complex or too heavily regulated	26 %	3.48
6. Costs of training apprentices too high	25 %	3.53
7. Apprentices spend too little time in the company during their training period	23 %	3.54
8. No qualified applicants for apprenticeship positions	26 %	3.59
9. No need for such a workforce in the foreseeable future	21 %	3.71
10. Trained apprentices often to leave the company after their training	20 %	3.73

Figure 1.9

Average cost-benefits for companies with apprentices and estimated cost-benefits for companies without



The detailed statistical evaluation reveals that the estimated (potential) net costs of training apprentices for companies without apprentices is clearly (and statistically significant) higher than the average costs of companies which offer apprenticeships. It is interesting to note that a mere 2 % of companies without apprentices did not offer this services in spite of the fact that the estimated net costs would mean that these companies would not suffer a financial loss. Therefore, it is impossible to say that it is an irrational decision on the part of companies not to train apprentices despite the advantages this offers (2004, 45). The benefit dimension is thus also worth considering. When we investigate the reasons why a company does not offer apprenticeships, it emerges that both cost and benefit arguments carry equal weight, with the most frequently cited reason being the lack of time. Quantifying the gross costs and benefits reveals that the benefits gained by training apprentices are clearly a more decisive factor for companies. This leads to a significant re-interpretation of why companies do not offer apprenticeship positions. In addition to the lack of time (companies with apprentices do not have more time, either), companies do not take on apprentices because the expected benefits-time investment ratio is simply too low. If companies could expect greater benefits, then the time factor would cease to be an issue (p. 45). As a result, an entirely new problem arises: the lack of benefits for companies that do not train apprentices would seem to imply that their deployment capabilities (i.e. work opportunities) for potential apprentices are insufficiently productive. The following observations, examined further in Chapter 3, can thus be made:

1. An ever-increasing division of labour and greater specialisation make it more difficult for companies to offer full-time apprenticeship positions. This has given rise to the idea of setting up **external training centres**.
2. The **organisation of apprenticeships** should be re-designed (share of in-school training, overall set-up, demands made on companies).
3. Whether **changes in the qualifications** will devalue apprenticeships in the future and whether the share of students at vocational middle schools should be increased remains a matter of debate. However, one thing is certain: the problem will be exacerbated if the organisation of apprenticeships does not change.

1.2.3 The Swiss vocational education system continues to focus on the needs of commercial and small businesses

This objection can be justified in part. Not only have individual initiatives of firms and economic associations helped to correct this situation, but the loosely worded Federal Law on Vocational Education of 13 December 2002 (BBG) has created the framework conditions for a more flexible design for occupational training. However, a fundamental problem persists – the gap is widening in terms of the occupational requirements of large and small firms. For example, a local baker or butcher requires different qualifications than their counterparts working for industrial production firms or for large distributors. The same is true for commercial occupations. Finally, large service providers (banks and insurance companies) tend to concentrate their apprenticeship training in their own training centres, which focus on an academic education but also involve practical training periods, thereby rejecting traditional commercial apprenticeships.

This problem can be countered by designing individual occupations differently (see Section 3.2.2, Chapter 3).

1.2.4 Academic criticisms of the dual vocational education system

A growing number of people, particularly German education experts, call into question the dual vocational education system (see for example Geissler, 1992). Many reasons are given. Some claim that it follows outdated concepts of occupations in traditional industries and is not flexible enough to adapt to the activities of modern industry and service providers. Training is focused too narrowly on static job descriptions and students are no longer adequately prepared to cope with changes in their working life, since nowadays an increasing number of people must find a new job once or twice during their careers. It also provides less than satisfactory framework conditions for the creation of a dynamic, system of further professional training. It also lacks permeability, i.e. young people are forced to choose an occupation too early in their lives, as the system will not allow them to hange to different occupations later on. Finally, it is increasingly claimed that this form of vocational education is less effective because the

outdated structures and objectives often have become entrenched at both the occupational and firm levels. The training provided by many firms lacks focus and apprentices are being misemployed for menial jobs and thus reduced to the status of cheap labour.

However, some renowned German education experts take the opposite viewpoint (see for example Lempert, 1995). They point to the positive changes in the design of the vocational education system (e.g. reduction in the number of occupations, improved cooperation between schools and firms), wrong interpretations of statistics on trends in apprenticeship market (e.g. varying supply depending on structural changes), as well as to the fact that its dual nature helps to ensure the real occupational integration and personal development of young people. In addition, the dual system counters the threat of the segmentation of the labour market, of personal relations and of society in general because it can offer all population groups equal opportunities for their professional development.

Unfortunately, although many scientific arguments for and against the dual vocational education system exist, they all offer inconclusive proof of the greater effectiveness of alternative systems. This key question is examined in more detail in Section 2.2 in Chapter 2.

1.2.5 Do OECD criticisms pose a threat to the Swiss vocational education system?

For the first time in 1990/91, Switzerland authorised the OECD to assess its entire education system (OECD 1991). Its final report was rather critical of the dual vocational education system. It considered the system too rigid and too strongly attached to outdated notions of trade associations, and claimed that it had failed to achieve a sufficient level of innovation. A further criticism was the continuing conflict between generalisation and specialisation in the basic education system, with experts considering that too much emphasis was placed on specialisation (too many occupations). They felt that apprentices, whose level of proficiency was described as being in decline, were not able to develop the knowledge they had gained at the lower secondary level. The experts ignored the fact that at the end of this education level young people had the choice between a dual and a purely school-based education. Finally, the OECD considered that the system was focusing too heavily on occupational training, that the general education system was being somewhat neglected and that the integration of foreign adolescents was unsatisfactory.

Although this is an old report, the criticisms are still worthy of consideration today as they reflect how experts from countries without a dual vocational education system understand the Swiss system. The fact that experts had difficulties arriving at this assessment was not only admitted by themselves, but was also to be drawn from the recorded discussions among the experts in charge of the report (OECD 1990, 154), during which one expert expressed doubts on the ability of the Swiss dual system to set higher requirements and was consequently set right by another expert with experience of the dual vocational education system. This is a good example of the fact that European experts do not understand the dual system and its acceptance by European specialists who are by and large unaware of the basic situation in Switzerland.

The next OECD report (OECD 1997) dealt with vocational education and was shorter. It criticised the fact that vocational education focused too much on the demand-side of the economy and that it did not favour life-long learning. Further discussion of other important conclusions of the report is beyond the scope of the present study.

Switzerland should pay particular regard to the OECD report on vocational education because it reveals the general mindset of experts, which could have a significant bearing on the later international recognition of vocational diplomas and certificates.

1.2.6 Will the objects and responsibilities of the education policy by the European Union and its decision-making procedures pose a problem for Swiss vocational education?

Especially politicians and young skilled professionals in Switzerland are increasingly concerned with the development of vocational education in the European Union, its impact on Switzerland and how Swiss vocational education policy should react. Although many aspects of EU vocational education policy are still not clearly regulated and are constantly being modified, we shall now outline a number of the most important features in order to work out a proposal for the basic position Switzerland should take.

In its resolution on the “General Guidelines for the Development of a Joint Activity Programme in the Field of Vocational Education” of 26 July 1971 (OJ C of 12.8.1971, p. 5), the Council of Ministers stated that the ultimate aim of such a programme should be “a truly common vocational education policy that is implemented in the framework of an increas-

ingly active employment policy at the Community level by means of such instruments as the European Social Fund, and at the same time meet the demands of general education and the social mobility of the workforce”, as well as “aim towards a gradual harmonisation of education across the community”.

This general aim of education policy is still valid today. Tracing the chronology of EU education policy decisions would be superfluous to the needs of this study (cf. also the summary in Strohmeier 2001), but we shall highlight a few aspects that are of particular importance for Switzerland.

The ultimate aims of the European Union can only be realised if all citizens in the member states are guaranteed freedom in terms of their employee status. i.e. that they are not discriminated against in the job market, in their salary and in the workplace, and that they can live anywhere they like without restrictions (freedom of establishment). Both of these freedoms require that the quality of education is by and large the same for all occupations (a decree by the European Court of Justice considers a university education as vocational education). However, there is the risk that a country will not recognise the curricula and diplomas, certificates of proficiency and other qualifications issued by another country because it considers that the education offered in that country is not as good as its own system. This would mean restrictions on these two freedoms by one country and therefore would block the ultimate aim of the EU. Since vocational education in EU countries varies considerably, a decision should be made on whether to standardise individual curricula across all member states and harmonise diplomas, certificates of proficiency and other qualifications. The 1985 resolution of the EU Council on the “Comparability of Vocational Qualifications between the Member States of the European Community” established that rather than standardising curricula, the European Centre for the Development of Vocational Training (CEDEFOP) would select occupations at the level of a skilled worker and identify the basic requirements with which diplomas, certificates of proficiency and other qualifications recognised by the member states should conform. The most important aspect of this resolution was the definition of five educational levels to serve as a reference with respect to the different certificates. These are summarised in Table 1.10.

Table 1.10

Structure of training levels required for the recognition of diplomas, certificate and other documents confirming completion of vocational training

Level 1	Short professional initiation
Level 2	Longer full-time or part-time training, including an apprenticeship where the holder is fully qualified to engage in a specific activity
Level 3	Technicians or corresponding skilled professionals who have completed compulsory education and have a comparable level of training
Level 4	Brief technical training at the university level (advanced technicians or assistants)
Level 5	Longer technical training at the university level
Source: http://www.qca.org.uk	

The aim here was to guarantee the comparability of training courses with the help of diplomas, certificates and other certificates of proficiency within the EU. However, these five levels are not legally binding for individual member states.

The next important step towards a standardised recognition of vocational school diplomas and certificates of proficiency was the second general system for the recognition of vocational education and training (Council Directive 92/51/EEC of 18.6.1992, OJ L 209 of 24.7.1992, p. 25 ff.). It concerns lower and intermediate vocational education, which include courses of a duration of less than 3 years or a secondary school education. The main regulations concern the recognition of certificates, requirements for migrant workers (who received significantly different training than that required in the host state) and recognition across vocational education levels.

The Communication from the “Promoting Apprenticeship in Europe” Commission (COM [97] 300 final of 18.6.1997) as well as the Council Resolution on the Quality and Attractiveness of Vocational Education and Training (Official Journal C 374 of 30.12.94, p. 1 ff.) were decisive for the weight given to the dual vocational education system. They set out the importance of this system, the need for greater promotion of vocational education in other Member States as well its integration in national education systems.

The Maastricht and Amsterdam Treaties clarified the rather vague legal positions. The importance of vocational education is now defined in one single article, namely Article 127 of the EC Treaty (now 149 of the ver-

sion consolidated by the Nice Treaty). EU activities to this end are organised according to the following objectives:

- to facilitate adaptation to industrial changes, in particular by means of vocational training and retraining,
- to improve initial and ongoing vocational training in order to facilitate vocational integration and reintegration into the labour market,
- to facilitate access to vocational training and encourage mobility of instructors and trainees and particularly of young people,
- to stimulate cooperation between educational or training establishments and firms,
- to develop exchanges of information and experience on issues common to the training systems of the Member States.

According to Article 189 (now 249) of the EC Treaty (consolidated by the Nice Treaty), the following may be used as legal instruments to reach vocational education policy goals:

- A regulation shall be generally valid in its entirety and directly applicable in all Member States,
- A directive shall be binding, as to the result to be achieved, upon each Member State to which it is addressed, but shall leave to the national authorities the choice of forms and methods,
- A decision shall be binding in its entirety upon those to whom it is addressed,
- Recommendations and opinions shall have no binding force.

Directives and resolutions are most often used in the fields of education and training. This means that the EU has full responsibility for setting legally binding education objectives, while the forms these take are decided on by the Member States. In relation to vocational education, phrased Article 127 of the Maastricht Treaty made it even clearer than the original vaguely Article 128 of the EC Treaty (now Article 149), by expressly stating that in the EU there should be agreement about the objectives only, not about the ways how this was to be achieved. The realisation of vocational education goals should therefore be pursued by using measures applied by the Member States (subsidiarity principle), excluding the harmonisation of laws and regulations of these Member States. In theory, the Commission may introduce concrete measures if they further strengthen the European Union.

Therefore, there are two important **conclusions** to be drawn with respect Switzerland:

1. It can design its vocational education system according to its own objectives. Above all, there is no compulsion to do away with the present dual vocational education system.
2. It is essential that this system guarantees that the quality of education provided by it is open to comparison, as this is a decisive factor in the recognition of diplomas, certificates and other certificates of proficiency.

Chapter 2:

The effectiveness of the dual vocational education system

2.1 Overview and problems

Questions concerning the future effectiveness of the dual vocational education system keep cropping up time and again. There are three ways to address this problem:

1. One can track the **transitional process**, i.e. observe the transition from statutory schooling to post-statutory education (lower secondary level = upper secondary level) (first step) and from post-statutory education to the job market (second step). The fewer problems there are in proceeding from one step to another, the more effective the educational system is.
2. One may compare the **different educational systems** and examine their impact in the light of certain criteria (e.g. potential in job market, preconditions for a flexible professional career over a person's working life, short-term effectiveness relative to the fulfilment of certain occupational tasks after basic education, etc.). The results enable us to distinguish between effective and less effective solutions.
3. Although perhaps less significant from an economic point of view, the **degree of satisfaction with one's education and job** is certainly important for people's well-being. We are primarily interested in the educational issue. If students in a purely school-based vocational or general education system were much more satisfied than students in a dual system, measures to reform vocational education would be necessary, since persons frustrated by their dual education would be likely to rapidly change their occupation soon after obtaining their final apprenticeship exam, undermining the effectiveness of the dual system.

These are the three aspects of the Swiss vocational education system that will be discussed below.

2.2 The transition process from the lower to the upper secondary level

2.2.1 Bases

As part of education monitoring in Switzerland, the Swiss Federal Statistical Office and three scientific institutions are running the TREE (Transitions from Education to Employment) project, a national longitudinal study of the transition from statutory schooling to adult life. The first data were published in 2003 (Swiss Federal Statistical Office 2003). Although these results are only provisional, they generate data that allow for significant findings concerning the situation of Swiss vocational education. We have summarised them briefly below.

2.2.2 Educational situation at 1 or 2 years after leaving statutory school

Hupka (2003) presents data based on a random sample and a projection relative to the educational situation of young people one or two years after leaving school in 1999/2000 (see Table 2.1).

Table 2.1
**Educational situation 1 or 2 years after end of
 statutory schooling**

Educational situation	1 year after leaving (2001)		2 years after leaving (2002)	
	Number*	Percent	Number*	Percent
Vocational education	38 000	46 %	53 000	64 %
Low requirements	9 000	11 %	14 000	17 %
Medium requirements	9 000	11 %	14 000	17 %
High requirements	15 000	18 %	20 000	24 %
Undefined requirements	5 000	6 %	5 000	6 %
General education	22 000	27 %	21 000	25 %
Matura & teacher training	19 000	23 %	18 000	21 %
DMS and others	3 000	4 %	3 000	4 %
Interim solution	19 000	23 %	5 000	6 %
Extra year of statutory schooling, pre-apprenticeship, motivational semester	14 000	17 %	2 000	2 %
Training period, au pair, prepara-	5 000	6 %	3 000	4 %
Not in education or training	4 000	4 %	5 000	5 %
Number of valid projected cases	83 000	100 %	84 000	100 %
* Projected on the basis of the 1999/2000 graduating class				
Source: Swiss Federal Statistical Office (2003).				

The following findings are important for an assessment of the vocational education system:

- In Switzerland, over 70 % of young people have direct access to certified post-statutory education one year after finishing their statutory schooling; after two years this proportion rises to 90 %.
- The number of students who opt for an interim solution after the end of their statutory schooling – or who are forced to do so – lies at 23 % (17 % with an extra year of statutory schooling, pre-apprenticeship, motivational semester; 6 % with a training period, au pair scheme, preparatory courses or language stays). For a number of these adolescents the interim solution is part of their regular education, e.g. when they have to gain work experience before beginning their vocational training or can only embark on vocational education at the age of 18. In the second year after learning school, the number of young people having opted for an interim solution falls to 6 %, whereas the number of those in vocational education rises to 64 %, an indication that there is a switch from the interim solution group to the vocational education

group. An analysis of the pathways confirms this. Around two thirds of the young people (65 %), who are in an interim situation one year after learning school, are in vocational training two years after the end of school.

- Among the young people who were not enrolled in any vocational curriculum during the first year after the end of their learning school, more than half (55 %) had successfully managed to enter the vocational education system two years after the end of schooling; a further 9 % were still in an interim situation; few went from unemployment to general education (3 %), whereas 34 % remained without a job. This represents a mere 2% of all the young people included in the study who were still not in post-statutory education two years after leaving school. This number is much lower than one might assume from general statistics which often present a very static “snap-shot” view. Nonetheless, the fact that one out of four adolescents must gain access to a certified education at upper secondary level via an interim solution, and that nearly 2 % of all the young never make it at all, is disquieting.

These general statements may be fine-tuned even further; among the wealth of detailed interpretations established by Hupka (2003) the following appear to be particularly significant for vocational education:

- Gender-based differences at the upper secondary level are still strong: three quarters of male students in vocational training two years after the end of their schooling, among female students this proportion is only slightly more than fifty percent.
- Differences according to linguistic regions are also considerable: in the German-speaking part of Switzerland, two thirds of young people are in vocational education, in the French and Italian speaking parts of the country only one half.
- Access to the upper secondary level is heavily influenced by the type of school at lower secondary level. Students of a Progymnasium or of a secondary school will find it easier to gain entry to a vocational education course with high level requirements. Thus the lower secondary level to a large extent determines the post-statutory educational career (see also Meyer, Stalder & Matter 2003). Students of Realschule and Oberschule in particular find it increasingly difficult to make the transition to higher vocational training.

If one includes reading skills as a measure of scholastic aptitude it becomes apparent that students with average skills in this area are directed towards a specific type of lower secondary level establishment in

more or less arbitrary fashion, a finding that was essentially confirmed by a study in the canton of Zurich [Moser & Rhyn 1996]. This explains why some students feel stigmatised when applying for an apprenticeship or other form of post-statutory vocational education, regardless of their level of competence.

- The TREE study again confirmed the importance of students' social origins for their post-statutory educational opportunities.

2.2.3 The interim solution

Meyer (2003a) examined the phenomenon of the interim solution in greater detail. For educational policy, its function is of particular significance. It may have a **compensatory function** (students choose it to make up for scholastic deficits and find better access to certifying education), an **orientation function** (orientation and decision-making) or as a **systemic buffer function** (an interim solution imposed by the lack of an apprenticeship or other position, or when the student does not fulfil requirements for vocational training [minimum age, training period]).

As stated above, 75 % of the young who opted for the interim solution successfully enter into the certifying upper level secondary system. 27 % of them accede to education with high requirements (mostly via vocational education), 48 % to lower or medium level requirements.

Compared to all the graduates of the statutory system, young people who opt for the interim solution are more frequently female, tend to come from socially disadvantaged or immigrant families, have fulfilled only minimum requirements at the lower secondary level and have a lower PISA rating for reading skills (TREE uses this rating as a measure of scholastic aptitude when differentiating results). Finally, it appears that prerequisites for scholastic aptitude (indicated by the PISA rating and indirectly by the type of school attended at lower secondary level) do not play a decisive role for acceding to vocational training with lower or medium requirements. Risk factors that increase the likelihood of interim solutions are: gender, social origins, and the degree of urbanisation (adolescents from rural regions are more strongly represented in non-school based interim solutions, above all in au pair schemes). Consequently, repeated claims that interim solutions are necessary to compensate individual scholastic, linguistic or other deficits are untrue. In educational policy terms, this raises the question whether it might not be more effective to re-direct at least a part of the funding earmarked for the development of the interim solutions (extra year of statutory schooling for example) to the extension

of the certified educational offers at the upper secondary level (Meyer 2003a, 109).

2.2.4 Influence of immigration background

Meyer (2003) also analysed TREE data in the migration context. Using PISA findings, he demonstrates that approximately every third adolescent lives in a family in which at least one parent was not born in Switzerland. Only about 14 % of the adolescents themselves were not born in Switzerland, more or less the same percentage does not speak the language at home that they have to use in school. If one accounts for the time of residence in Switzerland, it becomes apparent that only about 7 % of all students who leave the statutory system in any given year do not finish their entire education in the country. Proportions in this group vary strongly, depending on the country of origin (significantly lower among young people from Italy or Spain than among those from the Balkans, Turkey and Portugal). These data and other analyses show that the public debate overestimates cultural heterogeneity in the Swiss educational system and that one should not speak of “foreigners” in all-too general terms. Adolescents from an immigrant background fall into three more or less proportionally equal categories: one third come from the “Central and Northern” parts of Europe (France, Belgium, Germany, Austria) and have an average social position, sometimes superior to that of the “natives”. The second third is made up of second and third generation descendants of “earlier immigrants” (primarily from Italy and Spain), who have experienced a certain upward mobility in Switzerland. The third part comes from the “youngest” immigrant countries (the Balkans, Turkey, Portugal) and are at the lower end of the social scale. The Swiss educational system puts young people from the third group at a disadvantage. A far higher proportion of this groups attend the Realschule or Oberschule, and they have significant deficits as compared to the other immigrant groups and native Swiss students. Their statistical risk of not finding access to certified education is almost twice as high as for the Swiss; for female students and students with poor literacy who attend a Realschule or Oberschule the risk is even higher. With such poor pre-conditions young people from this group ought to be the most likely to obtain a vocational education with low or medium requirements. However – all other things being equal – they are disadvantaged in comparison to the native Swiss population. This prompted Meyer (2003, 118) to make the following paradoxical statement: obstacles to accede to post-statutory education for young people from the third

migrant group are the highest precisely in the options in which most of them would have the best chance of finding a place.

2.2.5 Conclusions

The following **conclusions for Swiss educational policy** may be drawn by analysing the pathways leading to post-statutory education:

1. A positive fact is that two years after learning school, almost 95 % of young people have found direct access to post-statutory education.
2. The disproportion between the supply of and demand for apprenticeship positions observed at a given time is rendered somewhat more relative when the developments affecting a class are observed over a two-year period. Many young people persevere and find an apprenticeship position during the second year (the proportion of interim solution candidates falls from 23 % to 6 %, that of young people in vocational education rises from 46 % to 64 %). However, it must be noted that many of them are not able to opt for their dream profession, but settle for second best. Unfortunately this problem cannot be solved by educational policy, since it results from the structure of the economy.
3. The high number of students who have no other choice but an interim solution at the end of their statutory education is indeed a cause for concern. This situation offers young people neither decent opportunities for development, nor is it efficient from a financial and economic point of view. Therefore we will have to examine whether this systemic buffer function can be abolished by educational policy measures (see Section 3.2 in Chapter 3 and Section 2.3 in Chapter 2). It is also important to note that this problem cannot be solved by vocational education policy measures alone; it requires measures at the elementary school level (more effective remedial measures for less gifted students). This not only concerns the organisation of the lower secondary level; it also touches upon how lessons are organised and conducted, and the ways in which the mission of education is perceived. There are more and more institutions unwilling to deal with general didactic or pedagogical problems that neglect weaker students.

4. Finally TREE data allow us to conclude that the position of many educational institutions towards immigrants is marked by negative prejudice, as confirmed by the study of Fibbi, Bülent & Piguet 2003.

This is primarily a problem for the statutory school system; it will have to make targeted and more differentiated efforts to integrate off springs from immigrant families.

5. Apart from the considerable number of students who (must) opt for an interim solution at the end of their statutory education, or who are forced into a vocational choice that does not correspond to their wishes (this however is not a policy but a structural problem) these data do not in any way contradict the effectiveness of a dual vocational education system at post-statutory level. The problem of the relative status of a Matura (the traditional Swiss upper secondary level diploma) and the final apprenticeship exam that also crops up in the TREE study, was discussed in Section 2.2.1 of Chapter 1.

2.3 Public measures to safeguard or increase apprenticeships

2.3.1 Outline of the problem

Two developments gave rise to the repeated demand that the state should implement measures to promote apprenticeships: the falling number of such positions on the one hand and the number of young people who finish their statutory schooling and are forced into interim solutions, on the other hand. This issue was also hotly debated in the Expert Commission for the new BBG. There are five possible variants:

1. a comprehensive bonus-malus system
2. tax cuts for companies that train apprentices
3. additional state-sponsored apprenticeship positions
4. the creation of a vocational education fund by the trade associations
5. subsidies (primarily for kick-start funding).

The present report contains only general considerations and no data-based calculations, which would be purely speculative in view of the disparity between available apprenticeship positions in various professions and regions, and the differences arising from a static or a dynamic approach to the apprenticeship situation.

2.3.2 A comprehensive bonus-malus system

Principle: A bonus-malus system would require from companies who do not train apprentices to pay contributions to the companies that do. There are two possibilities: either the system is directly related to the opening of apprenticeships, i.e. those who train apprentices receive a bonus (direct payment for example), those who do not have to pay (a form of **redistribution**). Or else the system is only applied when new apprenticeship positions are created or previously existing ones are made redundant (**incentive system**). The balancing (e.g. as a contribution per capita) is undertaken by the state or the associations. The reward or punishment of companies creates an incentive to create apprenticeship positions or at least not to make them redundant.

Advantages:

- All private sector initiatives are linked financially to the socially and economically vital task of education and ongoing education; cost is distributed more “equitably”.
- No additional expenses for the public coffer if the associations are in charge of handling the balancing.
- By doing away with apprenticeship positions companies achieve a competitive advantage against other companies. This system tends to cancel out competition, whereby differentiation reduces the neutralising effect. Its impact would be significant for small companies working at regional level only, and would have almost no impact for internationally active companies.

Problem:

- The reasons for the dysfunctional relationship between supply and demand in the apprenticeship market are very different, depending on sector, region and profession; moreover, they have not only economic reasons but also deeper social and socially political reasons (see Section 1.2.2.2 in Chapter 1). This makes it unlikely that financial incentives and burdens will be able to generate a comprehensive sustainable balance in this area. The creation of more apprenticeship positions in the short term will depend primarily on the height of the bonus and malus payments: the higher the incentive (benefit) or contribution, the more likely companies are to react.

Consequences: High bonus or malus contributions would conceivably lead to a slight increase in apprenticeship positions in the short term – especially in small and medium-sized companies. Many companies that provide quality training would probably not change their policy, although a bonus-malus system targeting every newly created and every liquidated apprenticeship position might have a certain impact. However, the sum would have to be relatively high to be effective. Moreover, this approach in no way solves the problem of redistributing existing burdens and would thus be “unjust” to a certain extent.

Generally one can say that a comprehensive, state-directed bonus-malus system would not solve the apprenticeship problem. If it were uniform, it would not take sufficiently into account the specific conditions in the various sectors and regions, while imposing additional tasks and unnecessary obligations on many companies. This makes a solution via trade associations or a collective labour agreement more sensible, though, it too, would not do away with the administrative problems mentioned above. However,

it would enable those in charge of associations to use the bonus-malus system to motivate their members to step up their efforts to fulfil their obligations in vocational education.

2.3.3 Tax breaks for companies that train apprentices

Principle: This measure of control is a variant of the bonus-malus system. The companies that train apprentices may apply for tax breaks (bonus) for the tasks generated by the training of apprentices. Companies without apprentices might have to pay a fictional contribution (malus). Apart from those listed below, the advantages would be much the same as in the system discussed in Section 2.3.2.

Advantage:

- Except for defining apprenticeship training costs, the “tax break” solution would be simple to implement.

Disadvantages:

- No budget neutrality for public spending.
- The bonus-malus system may prove dysfunctional:
 - **Dead-weight effect:** companies employ apprentices because they need them (companies with a production-oriented strategy). Thus the incentive will only be a subsidy for them; no new apprenticeship positions will be created.
 - **Reserve effect:** incentives may encourage companies to train apprentices for certain occupations in order to receive subsidies although structural changes have made or will make them redundant. This would mean that young people are trained for occupations for which there will be no job opportunities in the future; the problem of apprenticeship positions will have been solved at the expense of future employment opportunities (which could be alleviated if the vocational education system were to provide training in a very flexible manner, allowing for rapid career switches. However, this solution would not be very efficient).
 - **Training quality:** it is questionable whether companies who take on apprentices only because of the incentives would do a very good job of training them. It is likely that companies with difficulties would benefit from the tax incentive while doing the minimum at training level.

- **Structural effect:** an imbalance in the apprenticeship market may in fact be desirable, since it would help to remove the structural imbalance on the labour market.
- **Problems arising** from “buying oneself free of” educational obligations, where a malus would be paid without leading to the creation of new apprenticeships.
- A bonus-malus solution generates serious technical problems: how is its amount to be established? Too low, and its impact is nil; too high, and it would strongly affect small companies. How can one differentiate between the obligation to pay and the contributions to be charged? For various reasons, a uniform contribution would not be feasible, since there are companies which, for valid reasons, have never trained apprentices. And what happens with companies working in unappealing sectors or remote regions, which find it difficult to find apprentices in the first place? And what about pinpointing the “black sheep” among the companies which do not train apprentices, and distinguishing them from companies that have little or no opportunity to do so? An equitable bonus-malus system would have to be highly differentiated, leading to greater complexity and costs for its management and control.
- A general deduction introduced for the sake of simplicity would lead to great inequalities, since training costs vary from company to company (Hennig 1989).
- Tax deductions would not be very high, leading at best to positive effects for small and medium-sized companies, but not for the large ones. For the time being, the former tend to retain more apprenticeship positions than large companies, so that the impact of tax deductions would have little effect.
- Tax cuts motivate companies only if they are making profits.
- Especially in small and medium-sized companies it is difficult to establish the costs of training activities, since they do not have separate educational sections and staff. It is particularly difficult to define and control the cost of an apprentice master.

Consequence: For the same reasons as the ones cited above for the bonus-malus system, the tax break system might work in the short term but would have no sustainable impact on apprenticeship offers, also because it cannot achieve the degree of differentiation needed to control this situation.

2.3.4 Additional state-sponsored apprenticeship positions

This measure would increase the number of apprenticeship positions in the short term. It offers no long-term solution however, since it might contribute to training young people who could afterwards find no job (e.g. the administration can easily create commercial or management apprenticeship positions, but office automation reduces jobs in this sector).

2.3.5 Controlling measures by means of vocational education fund of individual trade associations (if needs be with a binding declaration (Allgemeinverbindlichkeitserklärung[GAV])) in a collective trade agreement

Principle: Individual associations may take the initiative and set up a vocational education fund, operating for all members under the bonus-malus system. This would counteract the loss of solidarity among companies within one association and contribute to a more equitable distribution of burdens connected with vocational education. The inclusion of this measure in the sectoral collective agreement, which could be declared generally binding by the Federal Council, could force companies who do not belong to the association to take part in this bonus-malus system.

Advantages:

- This solution accounts for the significant differences between the sectors by means of a targeted design of the bonus-malus system, and allows for a targeted use of the resources in the fund in line with the educational policy of the association.
- The binding declaration, which has a certain tradition in Switzerland, allows for coercive measures in associations that have to contend with many “outsiders” in the sector, without taking recourse to ineffective generalist solutions.

Drawbacks:

- Administrative measures once again take precedence over the association and its members; however, since this solution may reinforce an association’s long-term educational policy, this drawback is not so important.

- The setting of financial contributions may lead to frequent conflicts. If they are too small, the measure has no impact; if they are too large, they may lead to competitive bias (for example against foreign competitors).

The Expert Commission for the new law (BBG) and Parliament opted for this solution (Article 60 BBG), so that today there is an adequate means of control.

2.3.6 Subsidies

Should the situation become more critical, targeted subsidies could be considered as a last resort. They should be examined for their long-term impact according to the following criteria:

1. Subsidies would have to comply strictly with structural policies. Only those professional sectors should be subsidised that are likely to promise a sufficient demand for jobs in the future.
2. Only sectors and companies that pursue an investment-oriented education strategy should be subsidised.
3. Subsidies should focus on the facilitation of a direct passage from statutory schooling to post-statutory education. Interim solutions should not be subsidised, since this would consolidate them as part of the system.
4. Subsidies should be used as a last resort for disadvantaged parties who find no other possibility of vocational education. In view of the characteristics of this group, the idea of a federal vocational certificate via subsidies for willing associations and companies should be planned without delay (see Section 3.2.1. in Chapter 3).
5. Should the imbalance on the apprenticeship market become worse, new vocational education methods might have to be promoted (outsourcing of apprenticeships [see Figure 3.2]) by subsidies in the form of kick-start funding).

2.4 The effectiveness of a dual vocational education system as against a fully school-based one

2.4.1 Overview and definition of problems

Today we distinguish between four different vocational education systems in European countries:

1. Dual system (vocational school and in-company training, with many different variants)
2. School-based vocational training (full-time vocational school)
3. Mixed system (full-time vocational school with full-time in-company practical training periods)
4. In-company training (exclusively in-company vocational education).

This diversity has generated much debate. In view of the small number of comprehensive scientific and empirically grounded studies, it is as yet impossible to prove the superiority of any one system over the other (Schurer 1977; Spirgi 1986; Frick 2000). The studies do enable us to conclude that one system is more effective according to certain criteria. Table 2.2 summarises the findings that are more or less certified.

Actually, these findings confirm something that is almost self-evident: when basic education is guided more by “criteria of utility” (optimal job performance at the end of vocational education, no further educational measures), the dual system appears to be better. But when the criteria focus more strongly on theoretically-oriented new professional tasks, a purely school-based system appears to get the upper hand. It is particularly significant that theoretical interests and the willingness to continue the educational process are generally stronger among those with a fully school-based vocational education. The importance ascribed to individual criteria when making systemic decisions is largely a normative issue. Many companies – primarily the small and medium-sized ones – expect apprentices to be fully productive immediately at the end of their training. Thus they choose the dual system, which may no longer correspond to all present or future requirements. On the other hand, critics of the market economy tend to claim that the dual system is outdated and that fully school-based models are preferable; in this context common grievances are “exploita-

tion of apprentices”, “unscrupulous treatment by companies”, “inadequate in-company training”: Most of these arguments probably no longer apply, thanks to the introductory courses for apprentice masters, monitoring of apprenticeships, etc. (see Section 2.4 in Chapter 2 on level of satisfaction with vocational training).

The results given in Table 2.2. are provisional, and the research findings will have to be fine-tuned.

The following aspects should be accounted for:

1. The comparison of the dual with a purely school-based system will only become fully meaningful, when the ratio between theory and practice is solved. A fully school-based vocational education, completed by practical training courses tailored to the curriculum will have different results for the apprentices than education in a state-run vocational workshop (Lehrwerkstätte). A more flexible approach to the dual system (for example more theoretical education or a more flexible distribution of the time available for educational purposes between the company and school) also has a significant impact on learning results.
2. We still have too few research findings concerning the links between the vocational education system and the characteristics of the learning population (performance capacity, learning potential, motivation, etc.). The study on the Lernbüro (training office) in commercial apprenticeships may serve as a thought-provoking example (Frick 2000). It demonstrated that scholastic aptitude contributes more to successful learning than the recourse to and design of this instrument, or its absence. Students of vocational middle schools (Berufsmittelschule) achieved better results regardless of whether their curriculum included a Lernbüro or not.
3. Another as yet unexamined aspect deals with the scholastic level of students at the beginning of their apprenticeship and their choice of profession. One may suppose that previous scholastic achievement significantly influences the effectiveness of the various types of vocational education. Probably systems with a strong practical orientation are more effective for post-lower secondary level students who are “fed up” with school, whereas a fully school-based introductory phase is preferable for more intellectually demanding professions with a less practical orientation. Second, the procedure by means of which young people choose a future profession may also influence the effectiveness of the system. One may assume that the learning potential of those who were able to choose their “dream” profession will be less dependent on the system than those who had to opt for “second best”.

4. There are no empirical data concerning the cooperation between school-based and in-company education in the dual system. Lipsmeier (2000) distinguishes between four possibilities: (a) the evenly balanced curriculum, in which theoretical and practical learning content is clearly separated, each transmitted either by the school or the company, with balancing between the theoretical school education and practical in-company training; (b) the complementary curriculum, with a small, definable mixed area taken over by either the school or the company according to previous agreement, while the larger elements of the curriculum are clearly the responsibility of the company, the school or (in certain cases) of supra-company training, with a view to optimising learning processes; (c) the differentiated curriculum, in which full responsibility for purely vocational training lies with the companies and the rest of the occupational training curriculum is provided by the vocational middle school, as well as the rest of the general education curriculum; (d) the autonomous curriculum, in which the company and the school become more independent of each other, with the school offering both vocational and general subjects and topics (fields of learning). Currently, vocational education usually takes place according to option (c), although there are many pros and cons for each of these four solutions, usually based on practical experience and observation. There are no comparative studies on effectiveness, however, partly due to the fact that over the past years the main focus of attention was on cooperation between the learning environments in the differentiated curriculum, although the problem of cooperation has by no means been definitively solved. We must assume that the manner in which this cooperation operates, has a significant influence on apprentices' success (see also Euler 1999 and Euler 2004).

Table 2.2
**Comparative criteria to assess success in the dual system
and fully school-based education**

Criterion	Dual system	School-based education
Demanding professional functions (execution of practical activities)	Initially much better, evens out over time	The worse the in-company practical training course is, the more problems there are with the initial job situation
Dealing with difficult job situations (specialist and personnel-related)	Initially better, evens out over time	
Problems with work rhythm and job-related stress	Generally less problematic	
Adaption to company culture and dealing with hierarchic superiors		Generally greater initial problems
Consolidation in the job after end of apprenticeship (adapting to the new workplace)	More or less equal	
Understanding of theoretical bases of a profession (the specialist capacities of the teachers/masters and an even balance of theoretical and practical content in the dual system, and the weighting of practical training courses in the school-based education system are significant factors).		Better
Readiness to pursue vocational education	Ambivalent attitude	Generally higher readiness
Further educational measures immediately after end of apprenticeship		Generally better
Assessment of time spent in job and school	More or less equal	
Taking up different profession than the one for which the students were qualified	Generally more problems	
Embarking on professional activity after completing professional training (same profession)	Fewer problems	
Satisfaction in profession after completing basic education	More or less equal (The choice of a profession and the working conditions prevailing in the practical training have more effect on a person's satisfaction than the form of the professional training.)	

2.4.2 Conclusions

The first step is to arrive at a binding conclusion for vocational education policy.

There is no scientific proof that a specific vocational education system is generally superior to others. Such superiority depends on the selected criteria.

In Switzerland, there are two politically significant aspects:

- (1) The widely acknowledged superiority of the traditional dual system may in the present economic situation no longer apply. Although it retains its fundamental validity, it needs to be reformed.
- (2) Reforms cannot be derived from an analysis of economic trends, changes in the job market and job-related qualifications; the first question that has to be answered is: what is the aim of vocational education (a normative question)?

Concerning the objectives of the vocational education system, we propose the following approach:

1. The concept of an autonomous approach to educational policy (**social demand**) freed of considerations of economic utility (**demand**) should be refused, since there is no proof that it increases the flexibility and mobility of the labour force, with a resulting positive impact on technical progress and economic growth. For a long time it was assumed that employment reacts flexibly to changes in the educational system, automatically balancing out supply and demand on the job market. An example of this would be: the more academic graduates there are, the lower their salaries (in a free supply and demand system) will be. On the other hand, the salaries of practically trained professionals rise, since there is an initial lack of them; higher salaries in time lead to a growth in their numbers. With basic education freed from considerations of utility, flexibility increases for all workers and inequalities on the labour market are more likely to disappear. Moreover, in the longer term, inequalities in pay between the various professional groups will also even out.

Such a “mechanistic” vision of a dichotomy between the employment and the educational system is false, for two reasons. First, this model overestimates the flexibility of the employment system. The more rigid

the salary structure within a given society is, the harder it will be for salaries to fulfil the function described above. Second, under the social conditions we have today, persons with higher professional qualifications will hardly be willing to take lower-standing jobs.

Therefore, from an economic point of view it is wrong to completely separate educational and employment policies. The relatively balanced development of the Swiss economy is partly based on well-trained professionals whose job-based education has proved effective in their later work. The few empirical studies we have seen show that, even under changing circumstances, the dual system is able to provide this form of vocational education. Thus, there is no valid reason to do away with it. But it does need some far-reaching reforms.

2. For the public coffers, the dual system is cheaper than a fully school-based, state-operated vocational education system. Considering the current state of public finances, a switch to the latter model would be simply impossible.
3. On the other hand, a few empirical and many descriptive studies highlight many inadequacies of the dual system. Doing away with them – while leaving the positive aspects intact – is an aim of foremost importance. Without rapid improvements the dual system will not be able to survive in the future, although extensive political and economic circles are self-satisfied enough to continue with only a few superficial changes. This becomes more apparent with each debate reform. The decisive aspects for a revision of the system should deal with the following points:
 - a) System design: should it retain the **vocational concept**, i.e. basic vocational education should focus on specific job skills; or should there be a switch to a **fully modular solution**, offering numerous individual units, combined at will according to the system and its teachers or apprentice masters? If the vocational model is maintained, a decision will have to be made concerning the differentiation between specific professions and whether these should be grouped together under a heading of “occupational domains” or categories. The current basic model should be revised, making apprenticeships more general, to facilitate professional repositioning or the adaptation to changing requirements in the workplace. It is essential that new forms of duality be implemented fast.
 - b) Structure of education in specific professions and occupational categories: economic developments and rapidly changing job requirements call for a **more flexible** structure. The current rigid solution (e.g. 1–1½ days of vocational school, 3½–4 days of in-company

training, perhaps an introductory course) should be loosened up. The proportion of time spent in the **school/company** will have to be adapted to specific occupational requirements. On the other hand, **school modules** will have to be introduced throughout the entire apprenticeship and/or a fully school-based introductory phase will have to be introduced. Only such a customized apprenticeship structure will do away with the dysfunctions listed under 2.2.

- c) The integration of the less apt and less motivated students from among the lower secondary school graduates: since one may expect a rise in the proportion of these young people, ways will have to be found to integrate them in the vocational education system. This problem will take on great importance, as the qualifications required for most occupations are steadily growing (see the not all-too recent but careful study by Seitz 1988). This means that interim solutions may become the rule for weaker students, or that no apprenticeship positions may be available for them at all. The resulting rise in youthful unemployment will have to be countered by innovative measures. This will only succeed if the economy accepts such solutions.
- d) Companies that train apprentices should not be **overtaxed** with **training or administrative tasks** if they are to offer apprenticeship positions. Especially companies with a strategy oriented to wends production might otherwise fail to do so.
- e) Finally, regulations concerning vocational education (education decrees) will have to be given serious thought, so as to find a middle way between cut-and-dry regulations, and the necessary flexibility. Clear regulations are needed to ensure uniformity. If they are too restrictive however, (e.g. curricula that are too detailed and too much oriented towards learning objectives), they make planned reforms almost impossible. Considering the projected reforms for various professions which have proved complicated and difficult, greater flexibility will have to be sought.

The BBG of 13 December 2002 will have to be examined to see whether it creates the necessary preconditions to effectively alleviate the faults in the dual system, and to motivate all educational institutions and associations to introduce innovations.

2.5 Level of satisfaction among apprentices

The dual system would be in a bad way if the level of satisfaction among its target population – apprentices – were low. The TREE study presents data on this aspect (Stalder 2003). Five criteria are used to assess satisfaction for four educational situations (vocational education, general education, interim solution, not in enrolled an educational process, see Table 2.1). These criteria: pedagogical skills of the teachers/masters, versatility of the educational offers, room for manoeuvre in class and on-the-job training, pressure in the company and in school, and social support during the educational process.

These are the findings based on a comparison of the dual system with full-time vocational training and general education:

- In general, apprentices are distinctly happier with their education than young people in full-time vocational schools, secondary schools or school-based interim solutions.
- In general, apprentices tend to assess their in-company training more positively than their education in vocational school.

Comparing the five factors for satisfaction when comparing secondary schools/vocational schools/the dual vocational education system, we find the following aspects to be of importance:

- **Pedagogical skills:** generally, the pedagogical skills of the staff are rated as high (dual system at 3.01 on a four point scale, full-time vocational schools at 2.98, secondary schools 2.94, statistically insignificant).
- **Versatility:** apprentices view their education as somewhat more versatile than in the other groups (dual system 3.83; vocational schools 3.75, secondary schools 3.79).
- **Free options:** apprentices say they have fewer free options (2.59) than vocational school students (2.91) and secondary school students (2.82). The smaller freedom in vocational schools (possibility to execute targeted and self-determined activities) appears obvious. Short lessons, usually structured according to a set syllabus, hardly allow students much freedom, a situation that calls for a restructuring of teaching at the vocational schools (see Section 3.2.1, Chapter 3).
- **Pressure:** It comes as a surprise that secondary school students feel more under pressure (2.50) than apprentices in the dual system (2.35).

The appreciation for full-time vocational schools was 2.38. It is interesting to note that better reading skills and better grades in the last report prior to entry into the post-statutory system usually diminish pressure. It is also significant that young people in the dual system feel less under pressure although they must cope with challenges in both school and company.

- **Social support:** 80 % of secondary school students feel that they are backed by their classmates (interest of teachers and classmates in their progress), whereas vocational school students rate such interest at only 66 %. But 62 % claim to have the support of their teachers, which – in view of the comparatively little time these students spend in school – reflects highly on their teachers.

Here are a few concluding remarks concerning the educational situation of apprentices:

- The main focus is on practical training. Vocational school lessons are often perceived as too theoretical, and the students criticise the fact that they have too little opportunity to apply and practice what they learn in school in their on-the-job training. In spite of many calls for better cooperation between these parties, it continues to be inadequate (Euler 1999, Euler 2004 and Section 2.1 in Chapter 2).
- The apprentices' overall assessment of their in-company training is still positive (pedagogical skills of the instructors/apprentice masters [3.29], strong support [3.45], versatile tasks [4.5]; on the down-side, they mention less room for free options [3.18]; pressure owing to work in the apprenticeship position is rated as medium to low [2.60]).

This leads us to the following **conclusions**:

1. Generally speaking, apprentices are satisfied with their vocational education.
2. Consequently, the recurring claims that apprentices are overtaxed and exploited are unfounded (although there may be isolated exceptions to this rule).
3. Nonetheless, there is a twofold need for innovation: ways to improve assessment of vocational school teaching should be examined and improved. The question of cooperation between different educational partners also has to be re-examined (see Section 3.2.1 Chapter 3).

Chapter 3:

The Federal Law on Vocational Education (BBG) of 13 December 2002

3.1 Characteristics of the law

The basic elements of the BBG were defined in 1998/1999 by an Expert Commission, which included specialists from academic and scientific institutions, the federal and cantonal administrations, employers' and employees' organisations, and the agricultural, social and health professions. Their mandate was formulated in very general terms and included only the following provisions, some of which are legally binding:

- Pursuant to the revised Federal Constitution of 18 April 1999, the Confederation has been endowed with the competence to regulate all sectors of vocational education (trade and industrial occupations, the tertiary sector, and occupations in agriculture, the health services and the social services).
- Swiss vocational education is a joint task involving the Confederation, the cantons, and employers' organisations, trade unions, trade organisations, public and private providers of apprenticeship positions and other providers of vocational education.
- The Confederation has a subsidiary role and should focus on strategic issues. Cantons are primarily in charge of implementation and take part in the development and steering of vocational education. Providers of apprenticeships and educational programmes define educational contents and ensure that the qualifications of students and apprentices correspond to job market requirements.
- In principle, participation by employers and their organisations is voluntary. Owing to various imbalances, the Expert Commission did not always see eye to eye on this principle, and measures of control run by the state were called for in the event of a shortage of apprenticeship positions; the creation of a vocational education fund was proposed as a compromise solution. This could be set up by the organisations of a given professional sector and declared binding by the Confederation under certain conditions ([Art. 60 BBG]. See also Section 2.3 in Chapter 2).
- The dual system is maintained, but should be made more flexible and more permeable.

The Expert Commission also debated whether the law should be **open-ended**, i.e. whether it should establish a general framework for the entire concept of vocational education, which would then be enacted via decrees,

or whether certain elements of the concept should be embodied in the law itself. The idea of an open-ended law which, owing to the rapid evolution of vocational education, finally gained the upper hand in the Commission and was accepted by Parliament, was initially called into doubt by the trade organisations. Although in the political debate employers' organisations consistently pleaded for the reduction of strict regulations by the state, they feared in this case that state influence (and in particular the influence of the OPET) might become too great if it could use decrees to implement fundamental "conceptual" regulations. The idea of an "open-ended" law finally won; on the one hand it became increasingly apparent that too many fundamental provisions on vocational education would generate rigid legislation that would be slow to adapt to changing requirements. On the other hand, it also became apparent that cooperation between the trade organisations and the relevant federal office (OPET) would put a damper on the full deployment of state power.

In spite of these advantages, an open-ended law presents one major disadvantage that should not be overlooked: private sector trade organisations, that are not very innovative or still cling to educational strategies that are highly oriented to production, are unlikely to adapt the dual system along any lines that will make it more attractive.

This means that the design of an amended dual vocational education system will have to successfully meet one major **challenge**: the OPET must ensure that trade organisations take innovation into account when revising the relevant decrees.

This in turn may generate a major problem for the future development of vocational education decrees. It remains to be seen whether the cooperation between trade organisations and the OPET, which has until now generated a certain amount of conflict, may be organised in such a way as to make the dual system, as laid down by the open-ended law, truly innovative. One may assume that the openness, which also characterises the Decree on Vocational Education of 19 November 2003 (BBV), may fail to encourage innovation owing to a lack of framework regulation for the decrees, particularly when the economy is in the doldrums.

3.2 Requirements for an innovative dual system

3.2.1 Apprenticeships

We may assume that – considering the complexity of supply and demand in the apprenticeship market - innovative decrees alone will not solve the apprenticeship problem. The weaknesses of the previous regulations and trends in professional requirements make greater flexibility essential. A failure to operate the necessary reforms will seriously endanger the dual system in several sectors. The Message on the need for new federal legislation on vocational education of 6 September 2000 refers to the model established by the Expert Commission (page 5715), which focuses on how to respond to future requirements. Unfortunately, this document does not discuss possible innovations as formulated by the Expert Commission explicitly enough. For this reason we will discuss the essential characteristics of the Expert Commission’s model, which repeatedly answers the call for a more flexible dual system (see also Dubs 1999).

Initial observations in the field seem to indicate that a dual system **based on a profession or occupation** is easier to implement and offers a better basis for future professional activity than a modular system (see below). In the profession-based system, occupations are the cornerstone of basic vocational education, although they are no longer professions in a narrow sense. Depending on their characteristics, they are designed according to three principles:

- a) Specific occupations are grouped together into **occupational fields**, i.e. similar occupations form a joint domain with a uniform basic curriculum and the possibility of subsequent specialised training. The most innovative example of this solution is the new regulation of machine industry apprenticeships (ASM), by which 16 specialised trades have been grouped together into 4 basic occupational fields [automation engineering, electronics engineering, constructors and polymechanics]) (ASM [SWISSMEM 1997]). This innovation is particularly well adapted to jobs in large production companies.
- b) Wider areas of activity instead of specific trades or occupations are now the basis of the educational system. This solution is particularly well adapted to the service and the health care sectors.

- c) Parallel to this, specific **trades** will continue to be important for small and medium-sized companies, particularly in sectors in which a production-oriented education strategy is the rule (e.g. hairdressers).

When revising vocational education decrees in the future it will be of the utmost importance to check continuously whether education cannot be improved by grouping traditional occupations into professional domains or areas of activity.

For the past ten years, a **modular** solution has been discussed as an alternative solution to the one discussed above, although the debate has been hamstrung by a lack of clear definitions. Euler (1999, 92 ff.) distinguishes between three modular possibilities:

- a) The **differentiation concept**: Modules are didactic units, i.e. didactic blocks, which offer aggregate overall competence in one field of learning.
- b) The **extended concept**: The second possibility acts in complementary fashion, i.e. existing curricula are completed by thematic blocks, so as to deepen or expand basic vocational education – often on an optional basis.
- c) The **individualisation concept** (module-based): In the third solution the vocational education programme consists of independent units that may be selected individually and independently of each other and in any order (variable order) and are separately awarded a “certification”.

The individualisation principle was introduced first in Scotland and then in England (National Vocational System, NVQ). About 800 professional qualifications were defined according to five levels of qualification with different requirements, most of which may be freely chosen in order to build an individualised training course; they are tested and certified individually. A certain number of regulations concerning compulsory modules and the number of optional modules will have to be implemented. The competences acquired in the individual modules are decisive; there are no regulations concerning where they should be acquired (school, company, training association) (Kloas 1997).

There are as yet no comprehensive studies of the modular concept, making it impossible to assess its effectiveness reliably.

The pros and cons of the individualisation system in the German speaking countries have been dealt with in several studies (Deissinger 1996; Kloas 1997; Götze, Marty & Zeltner 1998; Pilz 1999).

They mention the following advantages (as a true alternative to the occupation-based concept):

1. The dual system is made more flexible. If and when the requirements as to the qualifications for a certain occupation or to activity change, it is not necessary to modify the whole programme (or educational decree); it is enough to adapt certain modules, add new ones or eliminate those that have become redundant, making long and often complicated reforms of programmes or the amendment of decrees unnecessary. Complete abolition of the occupation-based concept would also do away with endless discussions concerning the definition of professional domains and areas of activity, or occupational fields.
2. Vocational education becomes more market-oriented, and thus – as one may reasonably expect – more effective, since it corresponds better to the expectations of the companies and the learners.
3. Modules can be adapted to the participants' previous qualifications, by introducing several levels. This ensures that all learners get an education that is adequate to their needs and improves opportunities to foster those who lag behind.
4. Modules based on variably applicable competences or skills would “despecialise” vocational education, and ensure greater mobility in the job for the young.
5. Companies could design and conduct individual learning programmes with and for their trainees, responding more effectively to their own and the young people's needs.
6. Modules facilitate the coordination of basic and continuing education. Above all, they do away with the largely artificial distinction between these two levels; modules lacking in basic education could easily be completed at a further stage; or modules required at the further stage could already be taken during basic training.
7. Modules allow for risk-free testing of new qualifications. It being impossible to foresee how activities and occupations will develop, the occupation-based concept entails greater risks, since possible adaptations might make the entire curriculum or course redundant. With the module solution, erroneous conceptual decisions have smaller impact and could be mended rapidly.
8. Modules make for more systematic coordination of education and career planning.
9. Modules create possible synergies, since individual modules can be used for different learning requirements.

10. Modules are more cost-effective, since individual modules may be used for various learning purposes.

These are convincing arguments, but we should not overlook the **disadvantages**.

1. Increasingly, learning theory calls attention to the importance of preliminary knowledge and good cognitive structures (satisfactory systematic learning sequences). In many cases the individualisation concept leads to haphazardly structured sequences; inadequate previous knowledge and cognitive structures required for a module would greatly restrict its effectiveness. Thus, the main problem is the structure and constitution of the modules. But, if there are too many regulations as to how modules should be structured, the whole concept loses its purpose and character.
2. The idea that modules transmitting basic competences can lead to more flexible education and more effective transfer to new activities, once again brings us to the old issue of de-specialising vocational education. One may doubt however, that such de-specialisation and emancipation from comprehensive occupations and fields of activity will meet future requirements; the more complex the requirements are, the greater the need for a direct reference to a trade or occupation will be. If this is lacking, companies will have to take charge of the “hands-on” professional initiation of apprentices after the end of their education, since to a certain extent they will be incapable of fulfilling their professional tasks. It is doubtful that this would reinforce the dual system, above all in small and medium-sized companies.
3. The concept again leads to additive education: extensive fields of learning are sub-divided into modules, which are frequently independent of each other. Instead of making apparent the larger scheme of things, it transmits a wealth of partial skills or competences, creates waste and does not contribute to the often called for cohesion and networking effects. It does nothing to reinforce professional room for free options, especially when companies and trainees are given too many possibilities to choose from.
4. The concept is likely to create a trend towards short-term educational curricula or “crash courses” with a strong focus on immediate utility. This in turn may lead to a general fall in the level of vocational education and reduced professional mobility in the longer run.

5. This solution also means that trainee groups change constantly, practically eliminating coherent classes which are such an important part of the socialising process, of younger students or apprentices in particular. This may make them “homeless”, with a highly negative impact on those who are already disadvantaged (poor educational results, lower-class background).
6. Didactically speaking, the design and coordination of the modules is problematic, since problems of sequential coherence are likely to crop up time and time again. The attempt to solve these by regulating module sequences would make the system useless.
7. The planning and organisation of basic vocational education on a purely modular basis will make matters more complicated and probably more expensive, since the possibilities to choose between different options entail greater administrative activity.
8. The concept gives rise to an unequal educational status at the end of basic vocational education, and makes it more difficult for companies to hire young people for their first positions. It also does away with the transparency needed for collective salary and labour negotiations (collective agreements) with possible negative effects for employer-employee relations, particularly in Switzerland.

These disadvantages are so critical, that the concept should be abandoned at the basic vocational education level. As shown in Figure 3.1 however, it could be used in various other combinations.

1. The **basic apprenticeship period** is followed by a one-year, largely modular **supplementary period** (individualisation concept). During this year the apprentices who are not enrolled in a vocational secondary school select, together with their company, a number of modular blocks (these should be defined in the corresponding decree) in which skills are consolidated, specialised or expanded. These may be organised by schools, companies, associations of training firms, other associations and private schools. Students of vocational secondary schools follow corresponding courses in their schools instead of these modules.
2. **The temporal redistribution of school-based and in-company training**, according to the requirements of specific occupational areas and fields of activity or specific occupations, could contribute to greater flexibility of the dual education system. The current rigid arrangement (e.g. 1–1½ days in school and 3½–4 days of in-company training with an introductory course when necessary) should be abandoned; also the regulation that stipulates that there should be an obligatory number of

lessons per week throughout the apprenticeship. Since in many occupations and fields theoretical demands are rising constantly, companies are unable to make effective use of their apprentices at the outset of their training, and didactic innovations (e.g. group teaching, self-controlled learning) call for longer school modules, the distribution between school and in-company training must target the needs and requirements of occupations and fields of activity and of specific occupations. This calls for a greater variety of solutions, for example:

- 1–1½ days in school, 3½–4 days in company as is the case, now with perhaps a shorter, introductory that is block of modules fully school-based,

or

- longer introductory that is block of modules fully school-based, of up to one year, followed by 1–1½ days in school and 3½–4 days on the job, perhaps completed by individual blocks/modules in school, company, training association or trade association training centre,

or

- 1–1½ days in school, 3½–4 days on the job and a certain number of module blocks in school, company, training association or a trade association's training centre. These will be distributed throughout the entire apprenticeship period.

Other solutions are possible.

3. For **weaker learners** Article 17 section 2 BBG provides for practical vocational training. But the general character of the law entails the risk that this solution would simply prolong the pre-apprenticeship period, which has not been a success (Steiner 1980). Thus, here too the ideas of the Expert Commission should be implemented in a truly innovative fashion:

- weaker students choose a practical, intellectually less demanding activity in a company (e.g. cleaning/maintenance).
- at the beginning of their training primarily they are mainly active on the job; this is to avoid that their negative opinion of school influences their practical vocational education.

- schools no longer provide systematic and comprehensive education to these persons (general education), instead offering remedial programmes in areas in which they are particularly weak (e.g. first language, basic arithmetic skills). This solution should absolutely avoid the errors of the traditional pre-apprenticeship, which basically dispensed the same learning contents but at a significantly lower level.
- if the candidate makes satisfactory progress, a transition to vocational education is possible (permeability).
- these persons should be provided with special counselling and assistance.

Such individual solutions should ensure that weak students and other disadvantaged persons are able to find regular jobs with a federal vocational certificate.

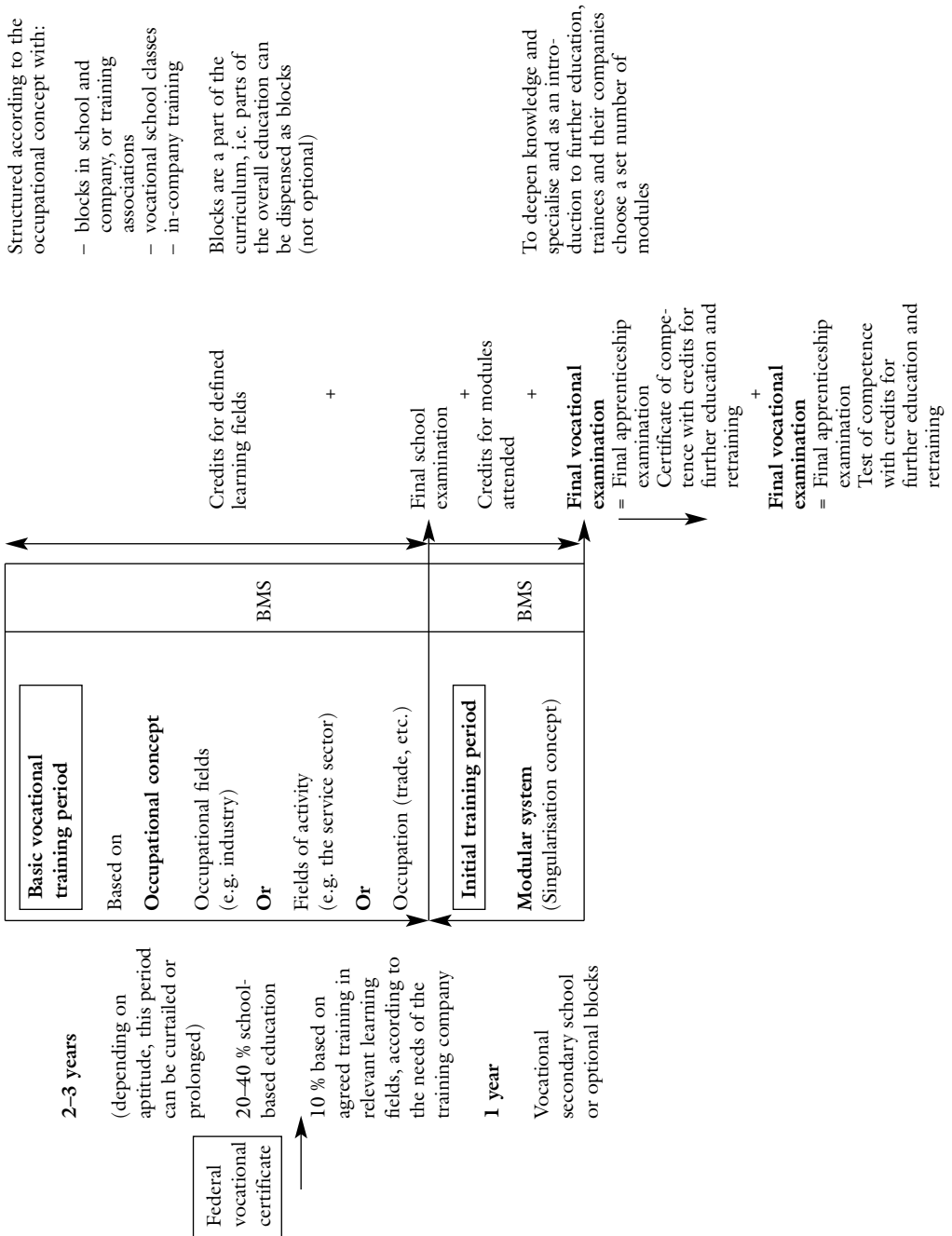
4. **Examinations** should be sub-divided into intermediary, end-of-semester, and final examinations, creating the prerequisites for a vocational education credit system.

The various decrees specifically establish the forms and sequences of **examinations**. The expert model (Figure 3.1) proposes this as the ideal solution:

- During the basic training period there are credits for set partial subjects that count in the overall assessment for the federal vocational certificate.
- At the end of the basic period there is a final school examination (vocational and general education) which also contributes to the final vocational qualification.
- If the decree provides for a special learning agreement (project work conducted by the apprentice under school or company supervision on an aspect of the company's activity), the result of this also counts in the final overall result.
- The modules of the initial training period are linked to credits that are taken into account in the final assessment.
- The initial training period is followed by a final examination which includes an interdisciplinary project relating to the profession or activity and is conducted individually or in groups.
- All these elements together generate the overall mark for the final examination. i.e. the certificate.

The BBG and the BBV are formulated in terms that are general enough so as not create obstacles to the legal enactment of the flexible expert model. The same principle applies to other models such as basic commercial training and the IT apprenticeship (see Message on the BBG of 6 September 2000, BBI 2000, pages 5715–5717) which have already been implemented.

Figure 3.1
Expert model of basic vocational education



This creates a problem, however. Since the decree (BBV) is also worded in general terms, the OPET must develop framework regulations with a few binding provisions on the structure of basic vocational education, and above all of examinations. If this is not done, flexibility – which is the actual objective – could generate so many models that it would no longer be possible to oversee them all, and that the principle of equal examination standards might be undermined. It would threaten the comparability of vocational certificates throughout Switzerland that was discussed above, and the recognition of Swiss professional certificates abroad.

In fact, the expert model leads us from a **dual to a three-track vocational education system** (education in a vocational school, in-company or in a training association as well as by means of variable modular blocks). The following **advantages** justify the model:

First, it does away with the rigidity of the traditional dual system. Vocational basic training in the individual sectors can be made more specific and oriented towards needs, particularly with a view to developments in the various occupational areas, which are becoming increasingly diversified. It should make apprenticeships more attractive for individual companies and their trade associations.

Second, it should make it easier to overcome the interest deficit for theoretical education among dual system participants, since both from a motivational and a didactic point of view it is easier to dispense it in modular blocks, as against the traditional solution based on individual classes. It should also facilitate the implementation of new didactic forms, such as project work or group instruction.

Third, a modular approach in the initial period should successfully counteract the lesser interest in further education among dual system participants, which may be due to negative experiences in school and to their incapacity to plan their ongoing education. The solution of a modular initial training year forces companies and apprentices to plan it, providing learners with the preparatory bases for further education and the possibility to experience more self-developed approaches in the future. This would also give apprentices more options, the present ones having been deemed insufficient in the TREE-study (Stalder 2003).

Fourth, the introduction of modules at the initial level (school, company, associations, agencies, private parties) would introduce a certain amount of competition into vocational education, and would be likely to improve quality.

Fifth, instruction in vocational secondary schools could be intensified. Students who initially attend regular general education classes instead of the modular programme will thereby not increase their absences from the company in comparison to other apprentices. This reinforcement of the vocational secondary school not only corresponds to the wishes of the UAS but also responds to critical EU opinions, which claim that Swiss higher vocational commercial, administrative and technical schools (HWV and HTL) do not always meet requirement levels (see Section 4.5, Chapter 5).

Sixth, the examination model corresponds to the scientific call for a variety of examination forms and to the idea that examinations should run throughout the vocational education process. This is meant to foster regular learning on the one hand, and do away with stress caused by a single final examination on the other.

Needless, to say, the model also gives rise to **problems**:

First, its implementation requires more organisational work than the present dual system.

Second, the model should not lead to exaggerated work cuts in the company. If this were to happen, many companies, especially those that pursue a production-oriented apprenticeship strategy, will simply take on fewer apprentices. However, they should be made attentive to the fact that growing demands in the labour market will enforce a stronger theoretical, school-based education, if the dual or three-track system is to remain effective.

Third, many aspects will have to be clarified before such innovations are implemented. This became apparent already at Expert Commission level, which decided against including framework provisions for a flexible three-track system in the federal law (BBG) so as to avert the possibility of a referendum. This clearly shows how difficult it is to innovate in the educational sector.

3.2.2 Training associations (Lehrbetriebsverbände)

Article 16 paragraph 2 of the BBG specifies that basic vocational education may be dispensed in and by associations of companies that train apprentices (Lehrbetriebsverbände), as well as in training workshops, commercial secondary schools or in other recognised practical vocational training institutions. Such associations are an innovation, originally designed for highly specialised companies which are unable to provide

comprehensive vocational training or apprenticeships because of their high degree of specialisation. In view of the lack of apprenticeship positions, and the impossibility of offering practice-oriented vocational training that is based on state-of-the-art investments in all companies and in schools, the idea of the association should be developed with a view to render the three-track system more flexible and differentiated. Here are some of the possibilities:

1. A company with relevant qualifications provides – as a part of basic education – modular blocks in a specific subject to apprentices from companies which do not offer the requisite corporate or technical conditions. With this model, apprentices stay in their company, but are grouped for a short period of time for such modular training on a regional or sectoral basis or within an association.
2. Several highly specialised companies form an association, which offers training to apprentices by rotating them from company to company, to provide them in the end with a comprehensive education.
3. Several companies form an association and outsource all training for the initial apprenticeship or for its entire duration. To this end they operate an external training centre or autonomous training agency (usually with the legal status of an association [Art. 60 ff. ZGB]) leading to the creation of a new learning site outside the company or training workshop. ABB did pioneering work in this area with its ABB training centres (now LfW training centres). Now there are other such centres: aprentas (Novartis, Syngenta, Ciba SC), Winterthur azw training centre (formerly Sulzer), Beruf Zug (formerly Siemens) or Siemens Switzerland AG. Such external training centres are financially independent; ideally, they strive to cover costs by the productive input of apprentices for member companies or third parties. One may expect that, besides basic vocational training, external training centres will provide other services to apprentices such as recruitment, further training for employees of member companies and advisory tasks. Schweri, Mühlemann et al. (2003) conducted an in-depth study of these centres and found that:
 - Net costs in these centres are usually higher than costs of a traditional apprenticeship; but in some cases training costs cover all expenses.
 - The level of productive output is higher in training centres than in traditional apprenticeships. This difference becomes apparent already during the first two years, but becomes even more marked in the third and fourth apprenticeship year, in which apprentices are entrusted with more difficult tasks.

- There are more persons who obtain a professional baccalaureate.
- One year after the end of apprenticeship, the proportion of people who stay with the company in which they trained during the second part of their apprenticeship, having spent the first part in a training centre, is significantly higher than among traditional apprentices.

Of course these empirical findings should only be seen as indicative of certain trends and not as evidence against the traditional apprenticeship. The data come from large companies in the machine and chemical industries, in which outsourcing poses no great problems and effective productive output can be generated. Thus, this innovative solution cannot be transferred to all sectors, companies and occupations. It will be adequate primarily for companies that pursue an investment-oriented training strategy in order to safeguard sufficient well-qualified young employees.

However, there seems to be general agreement that external training centres are a true alternative to traditional apprenticeships (Wettstein 2001; Schweri, Mühlemann et al. 2003), since these also offer other advantages. In the case of demanding occupations, it is likely to be easier to dispense theoretical knowledge in training centres (professional skills of apprentices); when the economy goes through ups and downs, the training centre can redress the imbalances within the apprenticeship, although there is a danger that it will have to bear risks connected with employment and financing. When centres select candidates for training, assume many of the organisational tasks and cover higher costs especially in the early training stages, burdens for companies grow lighter; companies going through temporary financial difficulties and those which no longer take on apprentices owing to lack of time, could step in during the second training stage.

3.2.3 Vocational schools as regional centres of competence in educational networks

In Germany, the transformation of vocational schools into regional competence centres has been discussed for some time (Bader 2001). The joint Bund-(federal) and Länder-Commission for Educational Planning and Research Promotion (BLK) defines these centres in the following manner: their aim is “basic, further and ongoing training and vocational education in specific sectors or occupational fields, as well as for trade associations or companies in the various regions; they help ensure adequate qualifications and the transfer of innovations. This function can also be fulfilled by vocational schools, if regional players agree.” (BLK, 16).

The following considerations are at the origin of this solution (Jeschke 2002): first, as a result of globalisation, regions are becoming economic entities. In the future, vocational education will have to be regionally oriented and demand-oriented so as to ensure that regional needs and potential are not overlooked. This will go against the centralised management of vocational education as we know it now. Second, competence centres should do a better job of the reciprocal alignment of basic and further education. Third, this solution is seen as a means of combating the imminent shortage of apprenticeship positions, by introducing training workshops (Lehrwerkstätten) in vocational schools (in a traditional manner or as cost-covering production units). In view of demographic trends, such competence centres offering an effective regional training programme may in the future increase the supply of qualified professionals (of which there may be a shortage). To put things in a nutshell: the proponents of this concept expect it to stabilise the situation in the apprenticeship and job markets in the longer run.

Vocational education networks are proposed to supplement the competence centres: schools, private providers and companies would join forces to tackle educational tasks and transfer them within a given region. This is linked to the perhaps somewhat utopian expectation that network participants will contribute to a grouping of competencies and that the region will become a “learning region” (Wilbers 2002).

Is it really possible to implement such a concept? First attempts are being made in Saxony, mainly owing to the fact that the situation as concerns both apprenticeships and jobs is still far from satisfactory in the new German Bundesländer. Whether this model can be generalised and will lead to more flexible solutions for vocational education with direct repercussions on the regional job market and economy is open to dispute. Teachers’ associations and trade unions tend to support these initiatives, whereas employers’ associations voice certain doubts (Jeschke 2002).

We are of the opinion that this approach should not be adopted in Switzerland, for the following reasons:

- The apprenticeship and job market situation in Switzerland is fundamentally different from that in Germany (particularly in the new Bundesländer).
- The idea of competence centres and networks is currently being implemented in the UAS, with satisfactory initial results. These efforts should be given priority status and brought to a successful end, without putting too great a strain on companies and the private sector in general.
- The Swiss solution based on training associations represents a truly innovative alternative; it should not be diluted by other activities.
- In regions with a shortage of apprenticeships and practical training periods for Matura students who want to go on to an UAS, vocational schools might be expanded into competence centres to increase the offer of training positions that the private sector is unable to provide; these schools could also be in charge of economic promotion via adequate specialisation.

This might offer a solution to the shortage of practical training positions for Matura students before their entry into a UAS.

3.2.4 The possible future evolution of the three-track vocational education system

Table 3.2 illustrates a model of a possible future development of a three-track system.

Table 3.2
Educational status 1 or 2 years after the end of statutory basic education

Periodic outsourcing to other sites (school, association, trade association's training centre, private providers)		Permanent outsourcing of large parts or of all in-company training to an external autonomous training centre	
= traditional three-track system		= outsourcing of apprenticeships	
Number of modules	Module content	Variations as to time plan	Variations as to content
Depending on the requirements of the specific profession or field of activity and occupation (just a few or several during the basic and initial training period)	1) Only vocational learning fields 2) Interdisciplinary learning fields	1) First year 2) First and second year 3) Throughout apprenticeship	1) Only vocational training (continued attendance at vocational school) 2) General education

The table makes it clear that a three-track system can be implemented in many different ways. The left column in Table 3.2 illustrates the expert model, whereas the right-hand column specifies possible forms of outsourcing to external training centres (autonomous training associations). Variants are characterised by length and content. A minimal solution would be to outsource vocational training during the first years, with a subsequent return to the company, and attendance at general and vocational education classes throughout. An intermediate solution: two-year

vocational training in the centre with subsequently one or two years' of in-company training and attendance at general and vocational classes throughout. The most radical solution: outsourcing of all vocational and general education to an external training centre, which would then in fact become a specialised vocational school (Berufsfachschule). This solution is often called for by the banking industry, but, understandably, is rejected by vocational schools. Its effectiveness would have to be critically examined. It would doubtless lead to an excessively rigid structure of vocational education, above all if it were to take place exclusively in a "training office". This solution might also endow the centres set up by financially strong companies with an elite character, so that there would be several levels of vocational education for one field of activity. This would have negative repercussions, above all for companies which do not belong to a trade association, since they probably would often have to make do with second rate candidates.

The most decisive element in vocational education, which Chapter 2 must have made clear, is real experience on the job. Thus, practical work and on-the-job experience will also be essential in training centres. They may therefore not develop into public supra-company training workshops (Lernwerkstätten) which are usually incapable of creating links to the real-life working experience. This can be observed this in Germany, where investments for training workshops run by the government are insufficient to ensure vocational education that is state-of-the-art. If one insists on training workshops, they should be production-oriented; this aim is easier to achieve with independent training associations.

3.3 The professional baccalaureate

Initially the vocational secondary school and the professional baccalaureate were subject to considerable controversy, (see Hässler 1977); they are no longer put into doubt today, but some questions remain.

The UAS often complain about the inadequacy of professional baccalaureate holders in languages and mathematics. There are two reasons why one should not overestimate these complaints. For one thing, higher schools usually find that students have been inadequately taught at the lower level. One reason may be that younger students do not view certain subjects as important as their elders do, who on the other hand fail to appreciate the specific aptitudes of the young. In fact, the higher school should “carry on” from the level of skills which new students have, and design its curricula accordingly.

More important is the question whether the right apprentices are being admitted to vocational secondary schools, i.e. whether they perform better than apprentices who do not attend such a school. Unfortunately, there is no empirical answer to this question. Since it has been found that there is a correlation between learning strategies and learning aptitude, Metzger (2001) attempted to compare learning strategies of students of ordinary Matura schools, professional baccalaureate students and vocational school students. At the beginning and at the end of their apprenticeship, students for a professional baccalaureate do better than apprentices without a baccalaureate in only three out of eight areas (such as dealing with fear, devising examination strategies and recognising what is essential). With respect to motivation strategies, they are better in the beginning but not at the end of the apprenticeship. Professional baccalaureate students are better than regular secondary school students in certain strategies, and worse in others, allowing for no cogent conclusions. Metzger notes that greater attention should be paid to learning strategies in the classroom (although this probably applies to all schools). Section 4.4.5 of Chapter 4 provides data on admission conditions to Swiss and German UAS in response to the argument that, owing to the small part that class instruction plays in the professional baccalaureate, the latter does not meet international standards.

A further problem of the professional baccalaureate has to do with admission to university. The Federal Council decree/Regulation of the Swiss Conference of Cantonal Directors of Education (EDK) on the recognition of professional baccalaureates for admission to third level insti-

tutions of 19 December 2003/4 March 2004, holders of professional baccalaureate diplomas are admitted to the university after a complementary examination in the national languages, English, natural sciences, social sciences and the humanities. It will have to be seen whether this examination (bridge between the professional baccalaureate and the university) will be implemented in a manner corresponding to the principle voiced by the Swiss educational policy “equal but different”, with reference to the standard Matura and the professional baccalaureate. The Dubs working group (see reports of 31 August 2001 and 6 December 2002) expressed the opinion that, in view of the principle of equality, the examination should not be differential (testing what is lacking in the professional baccalaureate in comparison to the standard Matura) but complementary. Unfortunately, this principle has been weakened by the political process, demonstrating once again that the principle “equal though different” is still mainly a political slogan.

The “bridge” solution ensures permeability between Swiss vocational secondary schools and traditional universities. However, it remains to be seen whether it will be recognised internationally. A European attempt to allow university admittance via a professional baccalaureate was made in the EU Leonardo da Vinci Programme with the EURO-BAC, in which 10 countries participated. A Swiss group took part in this project (Wettstein 2002), which has stalled everywhere except in Austria. Surveys conducted on and around the “bridge” solution showed clearly that Swiss universities are opposed to EURO-BAC, because it examines occupational subjects, an approach that the universities have refused until now. It is likely that Swiss professional baccalaureate holders will be admitted to European universities, since they are eligible for Swiss third level institutions. Apparently, Austrian universities now admit Swiss professional baccalaureate holders on a case-by-case basis, representing a possible first step in this direction.

3.4 Higher vocational education: federal vocational examinations (Eidgenössische Berufsprüfungen), higher federal vocational examinations (Eidgenössische Höhere Fachprüfungen) and higher vocational colleges

By rights, the tried and tested institution of higher federal vocational examinations have been included in the new BBG. These examinations, which are principally organised by the trade associations, are the reason for the quality of mid-level and small company management in Switzerland.

Nevertheless, they are today confronted with two problems. First, the issue of recognition of these examinations by the EU has not been settled. Second, there are organisations that now demand that higher vocational diplomas and higher vocational colleges be recognised at UAS level. From the point of view of educational policy, these demands should be refused, and for several reasons.

First, the UAS have been endowed with an extended mandate which now includes applied research. Higher vocational examinations and higher vocational colleges should concentrate on dispensing practice-oriented training and education for more demanding professional positions, and not mix this task with research, which in fact often amounts to pseudo-research. Their doing so would lead to a loss of profile for these two typically Swiss and economically effective educational pathways.

Second, two educational pathways with different profiles should not be mixed.

Third, the possibility to pursue further education while holding a job should be maintained, especially in view of the demand for such solutions; and because they seem to be losing ground with the introduction of the UAS.

Recently demands have also been voiced for a comprehensive recognition of diplomas from higher vocational colleges for students who transfer to a UAS (e.g. a three-year UAS course gives full credits for the two years in a higher vocational college). Due to the international recognition of UAS studies, this solution should be abandoned. There are already enough problems with the recurrent claim that the professional baccalaureate as a preparation for entry into a UAS is inadequate, without adding one more potentially critical issue.

3.5 Conclusions

Chapter 2 presented the weaknesses of the dual vocational education system, while Chapter 1 discussed the main problems connected with supply and demand on the apprenticeship market. The main question now is whether the BBG creates the conditions to tackle these problems. Basically, the answer is yes. The general wording of the law makes it possible to adapt educational decrees to the needs of trade organisations, apprentices and companies. Chapter 3 showed how innovative models are developed on the basis of the expert model. The future development of the three-track educational system will largely depend on whether trade organisations will introduce innovations – without revolutionising everything – and how fast they do so.

We should note the following **conclusions**:

1. The OPET will have to take on a **role of innovator**, i.e. it will have to investigate which occupations require innovation owing to changes in technology, economic structures, workplace and shifting social demands. If the OPET fails to **take a leading role** in innovation – or if it is kept from doing so by conservatives – the urgently needed innovative move towards a three-track educational system will not take place. In view of the structural and economic challenges that companies currently have to face, constructive cooperation between trade associations and the OPET will have to be a major focus; overly idealistic models for educational decrees are doomed to failure.
2. Considering the various possibilities to which the open character of the new law gives rise, the OPET should rapidly formulate a few **framework regulations**, on the one hand to encourage trade organisations to review existing conditions, on the other hand to ensure minimal uniformity of all educational decrees. This is particularly important for the **examination system**, in view of its importance for a clear definition of levels of aptitude and the quality of the three-track system, and potential issues relative to international recognition. These questions should have been regulated more effectively by the BBV (decree).

3. Finally, a list of innovations of foremost priority should be set up. One of these will be dealing with the numerous problems caused by young people from foreign parts with learning disabilities. Another one will be to design the federal vocational certificate (Berufsattest BBG Article 37 and Article 18 BBG) in a manner distinguishing it clearly from a continuation of the pre-apprenticeship, which has proved ineffective in many sectors (Steiner 1980). The sectors and regions in which vocational training associations ought to be set up will also have to be given serious consideration.

It is not enough to say that the BBG offers the best conditions for a successful continuation of the Swiss vocational education system; it is necessary to compare the Swiss system with systems in other countries, focusing strongly on job market qualifications for graduates of a three-track vocational education system.

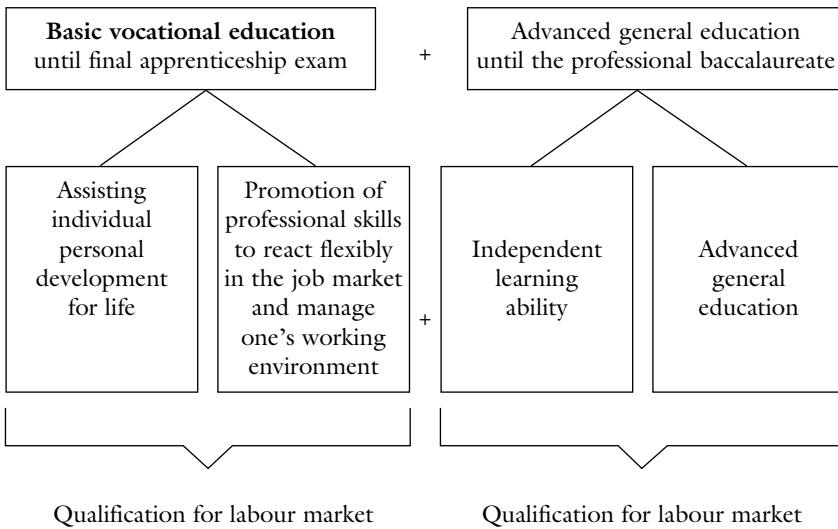
Chapter 4:

**The impact of basic vocational education:
cross-country comparison of the employability
and qualifications of students with a vocational
education**

4.1 Overview

On the basis of Article 3, Article 25 paragraph 2 and Article 17, paragraph 4 of the BBG and Article 2, paragraph 2 of the federal decree on the professional baccalaureate (BBV), the fundamental aims of basic vocational education can be summarised as follows (see Figure 4.1).

Figure 4.1
Basic objects of basic vocational education



The above-mentioned legislation clearly sees basic vocational education as a provider not only of qualifications that are purely employment-related but also of a more comprehensive education which promotes personal development. A decisive factor in youth employment is qualification for the labour market, in other words, whether young people can easily find a job after their apprenticeships. The promotion of independent learning and broader general education in the vocational secondary schools should ensure the qualification of students to continue their education successfully at a University of Applied Sciences. This may appear self-evident. However, it touches on several areas that have fuelled debate for many years, and not only in terms of education policy:

- What is the importance of general education within the basic vocational education system and is it necessary for personal development?
- What is the relationship between general and vocational education?
- What is needed to obtain high qualifications for the labour market?
- Is a vocational secondary school enough to provide a student with the necessary academic qualification to undertake a course at a University of Applied Sciences?

4.2 The problem of general education within the basic vocational education system

In German-speaking countries, the issue of pairing general and vocational education has been discussed for around two hundred years and can be traced back to the new humanistic movement (cf. also Abraham, 1966). Based on observations of the school system at that time, proponents of this movement concluded that a single purely utilitarian and expedient vocational education provided by industrial vocational schools and firms did not contribute to the personal development of its students. It was felt that people could not develop in an environment where they were under daily pressure to perform according to economic criteria. They needed an environment free from the pressures of work to focus on “the good, the true and the beautiful”. Between the two world wars, renowned cultural philosophers (Kerschesteiner, Spranger, Litt, and Dörschel) pointed out that economic and vocational contents are perfectly suited to assisting the personal development of students if they focus not only on one-dimensional professional usefulness, but also if they adopt a more comprehensive approach. This means that teaching, in addition to developing occupational skills, must prepare students to understand change in order to react flexibly and prudently, to motivate them, to increase their willingness, to examine their actions critically and to focus on their personal development. This way of thinking enjoyed only limited success, and the duality persisted. Over the years, work on pinpointing and defining the “academic” subjects that better met these aims than vocational subjects continued apace. Yet, an increasing number of people, particularly members of the business community, claim that it is simply not possible to achieve these objects of personal development due to the apprentices’ lack of interest in traditional subjects. As a result, they are abandoned in favour of subjects that are relected to occupations, which are considered sufficient to promote personal growth if they are taught well and developed properly.

The argument here is that students’ personal development can be improved regardless of the subject area as long as the right didactic and methodological approaches are applied. This means that a definitive solution to this problem of duality is not possible, since the provision of comprehensive education and life-long learning are more important. If basic vocational education and training is limited exclusively to the promotion of professional abilities and skills, students will think and act more one-dimensionally. In view of the many societal, social, cultural, political and

economic problems of our age, everyone requires a broad-based basic education to ensure that they can deal with a wide range of problems, to recognise and understand them in their different guises, and to take an integrated approach to finding solutions. In other words, a person whose knowledge or skills are not broad-based will lack the motivation to deal with and ability to deliberate on problems of this sort, and thus will be insufficiently prepared for life-long learning. This is why the basic vocational education system must provide both instructions related to professional skills and a general education which is independent of the requirements for that occupation itself (also see Dubs 2001).

Kell (1985) takes an interesting approach to general education by proposing the following variations to the structure of general education at vocational schools:

1. The **catch-up function**: Since many young people have certain deficits in terms of the education they received at the lower secondary level (ranging from a lack of cultural references to weaknesses in integrated thinking and reasoning), general subjects in vocational schools should be designed to enable them to fill these gaps, i.e. general education should create better chances for life-long learning among less capable students.
2. The **function of qualification**: General education is designed in such a way that it facilitates or makes possible the transfer to continuative schools. Differences must be resolved by integrating those subjects of general education which are important for studying at a continuative school. The mobility and the permeability of the school system are at the fore here.
3. The **supplementary function**: this concerns supplementing education related to occupation to meet three different goals:
 - 3.1. **function of reinforcement**: providing the student with the necessary qualifications to exercise a certain occupation, with greater teaching support in individual vocational subject areas which also involve more general education instruction to promote a comprehensive approach to learning.
 - 3.2. **compensatory function**: the greater the pressure on students as a result of changes in the labour market, the more important it is to have a choice of subjects in general education that allows for independent thought and reasoning.
 - 3.3. **substitute function**: The higher the degree of specialisation in vocational learning in response to more exacting occupational requirements is, the more important it is to promote a more com-

prehensive approach to the general course content of basic vocational education.

Debate on the value of general education content within the basic vocational education system could be diffused, if more consideration were given to these objectives when establishing educational regulations. Based on our comments in the introduction, regulations must focus on the substitute function of apprenticeship training, i.e. the form of general education instruction must supplement the vocational content. This would enable apprentices to consider the latter not only in terms of the acquisition of skills and abilities related to occupation, but also to see it from a more comprehensive viewpoint. This should also help to motivate students and increase their knowledge, which in turn will ultimately allow them to cope with and reflect on the day-to-day problems they will encounter in real life. The catch-up function is of particular importance for the federal vocational certificate. The greater the number of weaker students who opt voluntarily or must choose this form of vocational education, the more important it becomes to ensure they do not receive an abridged version of the general instruction normally given in other vocational education courses. Instead, these students should be given the opportunity to make up for their educational deficits by giving them a chance of transferring to the apprenticeship route, as provided for in Article 10, paragraph 2 BBV. In other words, the mistakes of the pre-apprenticeship option (no clear and self-determined definition of objects) contained in previous vocational education legislation, should not be replicated. However, we should not harbour any illusions. The successful integration of the catch-up function has its limits – the difficulty with correcting educational deficits increases the older the students get. Furthermore, the causes are not only related to the students' family and social backgrounds but also to low motivation that will have taken root already in their formative years. Other reasons lie with a lack of knowledge and ability which are more difficult to bridge with time, due to the cross-linking of knowledge. First and foremost, the problem of different development opportunities offered in the basic vocational education system should be overcome by improving elementary school classes, as it is often too late to attempt to redress the educational balance by the time students undertake an apprenticeship.

The function of qualification is important for vocational secondary schools. The task of general education at this level is to prepare students for further study and to provide them with a broad general base, which enables holders of a professional baccalaureate to cope with the challenges of a specialised third level education, where teaching increasingly inte-

grates societal, social, cultural, political and economic issues. In this way, general education also fulfils a substitute function.

An in-depth look at the design of general education content in the basic vocational system would be beyond the scope of this study. However, we should look at two aspects that are decisive for the future. First, one must establish whether instruction in general education should be classified by subject (such as the 1970 curriculum for industrial-trade vocational schools which included instruction in first language, economics, law and business), or whether there should be integrated instruction in one single subject that is classified according to topic (fields of learning) (as in the present framework curriculum for instruction in general education [ABU-RLP] in trade-industrial vocational schools, which came into force in the academic year of 1996/7). Even today debate rages on the most effective form (cf. also discussion on curricula in Germany, particularly Lipsmeier & Pätzold 2000). Whether the ABU-RLP will stand the test of time is yet to be seen. An initial evaluation (Dubs, Prandini, Zwysig, Käppeli 1997 and 1998) of the quality of curricula developed by individual schools according to the federal framework curricula revealed that these varied greatly, ranging from the excellent to the substandard. Unfortunately, it was not possible to evaluate their effectiveness. However, it would appear that the ongoing classification of individual subjects according to topic throughout the apprenticeship period does not enable students to develop the necessary knowledge structure required in further education. Systematically acquired knowledge structures that are subject-specific, are an important prerequisite for more in-depth and integrated learning processes (cf. also Weinert [2001]). In view of this, it would make more sense to design instruction according to subject, while subject integration should only be undertaken if students have acquired an adequate level of specialist knowledge and abilities that are discipline-oriented. The revision of general education curricula for trade-industrial vocational schools, launched in January 2004, should take these issues into account.

A further problem concerns the notion of skills. Legislators believe that the quality of instruction in many vocational education curricula can be improved by greater focus on specialist, methodical, social and personal skills (cf. Euler & Reemtsma-Theiss 1999). In many of the ABU school curricula we have studied, such classification led to greater fragmentation and, in some cases, randomly selected course contents. The study also revealed that social skills in their abstract form were considered important but not in relation to any technical content of curricular components. Dividing schools into four separate categories is a moot point. By focusing on skills in the broad sense of the term, curricula are able to account for

demanding learning situations in connection with specialised teaching content, as well as for the motivation and willpower of the students (Weinert 2001). This issue is important if new regulations of education replace learning results with educational standards in the form of skills that students must acquire by the end of the learning process. Above all, this paradigm change should not be made hastily, since there are still too many practical questions related to instruction that remain unresolved (Dubs 2004c).

To summarise:

Although many apprentices show more interest in subjects of vocational education and many firms are more interested in the apprentices' vocational training, general education should continue to be a permanent part of vocational education teaching. The aim is to counteract a one-dimensional approach in the professional and economic formation of students, while motivating them and providing them with the necessary tools to think comprehensively and to reflect more deeply on social, cultural, political and economic issues.

The design of curricula in general education must consider the various aims of individual basic courses in vocational education. Today, the catch-up function should be given particular consideration in terms of the federal vocational certificate, as the number of weaker students is set to rise in the near future. In addition, care should be taken to ensure that learning content in general education are not decided at random but allow for the systematic development of knowledge structures, which are prerequisites for independent and life-long learning. In other words, curricula should not be designed exclusively according to individual subjects in general education. Furthermore, particular focus should be given to establishing a comprehensive definition of skills.

There is no general answer of how general and vocational teaching content should be distributed. Solutions can only be found if the design of the curricula (e.g. number of blocks or existence of an introductory year) and the learning requirements are clearly defined.

In view of the little recognition paid to general education by firms and the lack of motivation shown by many students, the OPET favours the introduction of a standardised general education curriculum for all vocational education courses in Switzerland.

4.3 Employability of apprentices

The employability of apprentices is good, as long as the transition from an apprenticeship to a professional activity entails few risks. In other words, it is possible to integrate apprentices directly in the workplace and youth unemployment is low.

The employability of apprentices who are trained through a three-track vocational education system is often cited as a decision factor in decreasing youth unemployment. Figure 4.2 would appear to confirm that it is lower in countries with dual and three-track systems than in countries with a purely school-based vocational education.

Figure 4.2
Youth unemployment among 15–24 year olds
(as % of the labour market)

Country	2002
Germany	1.1 %
Austria	0.8 %
Switzerland	1.5 %
Belgium	2.6 %
France	1.8 %
Note:	The Swiss figure quoted here is higher because the statistics also account for interim solutions (see Chapter 2, Section 2.2.3).
Source: International Labour Office. Yearbook of Labour Statistics (2003)	

Admittedly, cross-country comparisons of youth unemployment are not the only qualitative criterion for a vocational education system. The general situation of the labour market (particularly with regard to adult unemployment) as well as its specific structure (stratification of occupations according to qualification requirements, differentiation of workplaces according to the degree of specialisation, salary level and structure, share of women, protection against unfair dismissal, average age when entering the labour market) must be also taken into account (cf. Topel & Ward 1992; Büchtemann, Schupp & Soloff 1993; Schneider & Pilz 2001). Nevertheless, dual or three-track vocational education systems seem to have

a positive impact on employability, because search unemployment is relatively low and the mobility of the apprentices is high. These two aspects can undoubtedly be traced back to widely standardised apprenticeships and basic vocational education and training that corresponds to the needs of many firms and is sufficiently flexible to allow graduates to change their employer or occupation (cf. also Descy & Tessaring 2002 and Blossfeld 1991).

More precise conclusions on employability can be drawn by comparing the main characteristics of a vocational education system (e.g. extent of specialisation versus greater generalisation of the occupation-related training provided in firms) with the structure of occupations (e.g. many specialist occupations versus more generally oriented occupations (cf. Müller & Shavit 1998)). It is clear that a vocational education system in a country with greater occupational specialisation and more clearly defined occupational structures (large number of highly specialised occupations) reduces problems of transition. This can be shown by the economic models of firms' hiring policies (Rosen 1972). More specialised training prepares apprentices for direct employment in their given occupation. It also means that firms have lower integration and retraining costs. Therefore, firms tend to choose employees with suitable basic vocational qualifications. Attention should also be given to the career development of individual graduates. Basic vocational qualifications become less important the more working experience a person has. When recruiting new staff, employers tend to attribute greater importance to the applicant's previous work experience (Becker 1998).

Unfortunately, it is still not possible to offer a conclusive analysis of such links in Switzerland due to insufficient data. However, Gangl (2003) was able to highlight these trends in his study of twelve European countries (excluding Switzerland). He arrived at the following conclusions:

- Data on the twelve countries confirmed that the institutional (vocational education system) and structural (occupation-specific) framework conditions determine the value on the labour market of educational qualifications.
- In all twelve countries, occupational specialisation and in particular a dual or three-track vocational education reduced transition problems compared to relatively more demanding training and to a purely school-based vocational education.
- Admittedly, the positive effects of occupational specialisation in the dual or three-track system are limited to the short term, i.e. during the initial years of employment and gradually level off the longer the person is employed.

- The data also showed that sound general education tends to lead to more advantageous opportunities in that labour market in the medium and longer term (cf. Kopri & Mertens 2002). Admittedly, further studies are needed to determine whether this statement is valid in absolute terms or whether it should be further differentiated according to the structural framework conditions and the various levels of proficiency of trainees.
- Furthermore, the dual or three-track vocational education system appears not only to act as a safety net for young people from intermediate and lower educational levels, but is also a safe option (Shavit & Müller 2000) in terms of professional usability. However, due attention should be given to poor professional mobility as a result of premature specialisation.
- Greater mobility can be achieved by broadening specialisation accordingly (e.g. modularisation according to the supplementary concept, expansion of general education) in the dual or three-track system.

To summarise, the following general observations can be made:

1. As a general rule, the dual or three-track vocational education system guarantees the employability of qualified apprentices.
2. However, the link between occupational structures and specialisation in basic vocational training is worthy of particular attention. The more firms follow the production-oriented training strategy, the greater the need for specialisation are to ensure that students continue to be qualified for the labour market. Since a large number of trainees carry out their apprenticeship in small and medium-sized companies (which are still characterised by highly specialised professional activities in their given economic sector), they will not experience any serious problems of finding employment in the near to medium future. This could shift abruptly if traditional small and medium-sized companies have less need for specialised occupations due to technological advances and structural changes. As a result, the dual and three-track vocational education systems would be greatly devalued, although this is not likely to happen in the short term.
3. There is also a problem of societal and social policy. Over time and in view of technological advances, specialised occupations will increasingly involve undemanding, though economically important

activities. This will widen the gap even further between less demanding traditional and modern professions. It will also have a knock-on effect for salary levels. Consequently, there will be greater calls from those with an interest in social policy to dismantle the close links between specialised occupations and the dual or three-track vocational education. In the interest of ensuring equal opportunities of employment, they will also probably favour a move towards a purely school-based vocational education with less specialisation and enable students to cope with structural changes and prepare them for life-long learning (cf. also Gangl 2003, 86). This is the **real dilemma facing the dual vocational education system**.

4. There are no radical solutions to this dilemma.

a) Let us assume that the decision favours a purely school-based general vocational education. This would undoubtedly increase the professional mobility and opportunities of career development of very capable students. What would happen to weaker students? Their professional opportunities would be significantly reduced and many would find themselves no longer integrated professionally and socially. It is illusory to think that a purely school-based system with remedial and extra courses could solve this problem because as students grow older it becomes more difficult to overcome basic learning deficits and motivational weaknesses that are motivated by their personality.

We should also have the courage to admit that a healthy economy will always require people to carry out undemanding work. This is why a system of education should not only focus on professional and social integration, but should also provide those who lack opportunities due to motivational problems and poor skills with training that are best suited to their needs. It is self-evident that this training must be organised properly and should be as permeable as possible (and must be provided for in Article 10 BBV on the two-year apprenticeship and federal vocational certificate option). This would require a socially oriented wage policy, an issue that goes beyond the scope of the present study.

b) If we assume that the dual system is allowed to continue in its present form, all available studies indicate that it currently guarantees the employability of apprentices better than the purely school-based system. The question though is how long this situation will continue. It is very likely that the high degree of specialisation in

many training courses will have a negative effect in the medium term, and the employability of qualified apprentices will be further reduced in a range of occupations (but not all).

5. In view of this dilemma, a **compromise** should continue to be sought when establishing education regulations. On the basis of observable trends, the following criteria should be given special consideration:
 - a) The future importance of a profession. The greater the likelihood that a profession will still exist in future, the more specific the regulations related to the training of that profession should be. Otherwise, a new system based on an occupation or field of activity should be introduced.
 - b) Specialisation and generalisation: if a profession is likely to remain unaffected by structural changes, the more reason there is for specialisation in basic vocational education.
 - c) Apprenticeship supply: the higher the number of apprentices taken on by firms with a production-oriented strategy is, the greater the level of specialisation needed in occupational training should be. Otherwise, firms will cease to take on apprentices.
 - d) Professional mobility: even in highly specialised occupations, students must be provided with a sufficiently broad-based education (particular in school-based training) to ensure that they have a minimum level of professional mobility.
6. The expert model presented in Chapter 3 creates the prerequisites for the design of an apprenticeship that takes into account these requirements, while providing individual solutions for each occupation, or field or area thereof, as the following considerations show:
 - If training is driven towards specialisation, teaching blocks could provide general education in the three-track system. This would improve professional mobility while retaining more specialised basic education.
 - The initial specialisation phase has a more general focus, while the basic apprenticeship centres more on specialisation.
 - The initial training period which is purely school-based tends to have a more general focus, while the on-the-job part of vocational education and training may be very specialised.
7. Overall it appears that a flexible three-track vocational education system that accounts for the requirements of individual occupations

guarantees future employability. From a national perspective, it appears to be more effective than purely school-based vocational education.

Nevertheless, the current Swiss dual system is still too rigid and will not be able to keep pace with changing economic needs. The relevant Federal Office and trade associations must embark on cautious reforms of educational legislation as soon as possible.

4.4 An international comparison of vocational education systems

4.4.1 Comparison of different types of vocational training

There is a long tradition of comparing different types of (vocational) education systems. A popular approach is to establish educational indicators, which are collected by means of a standardised procedure. The best-known example is the OECD “Education at a Glance” report, which gathers, analyses and publishes educational indicators for different countries (Westholm, 1994). Most studies of this type primarily involve a comparison of selected features of the various national education systems. The results highlight possible improvements or parts of the education system that should be abolished. These indicators should allow researchers to ascertain the quality and effectiveness of the education system. For example, Lipsmeier (2001) drafted a battery of 20 criteria to measure the efficiency of vocational education systems. However, these do not offer any concrete conclusions on the impact of the dual vocational education system, as the evidence they provide on individual aspects of the system is too general. There is a wealth of theoretical studies on international comparisons which detail the prerequisites for improving the comparability of vocational education systems (see for example Borch, Dietrich et al. 2003). However, empirical studies are more important as a basis of comparison in the context of recognizing vocational qualifications by means of an education credit system. This though seems “doomed to fail” (Borch, Dietrich et al. 2003, 7), because the vocational education systems are simply too different (especially in terms of learning results and the demands of interested parties). Therefore, we shall outline two attempts with a pragmatic approach to quality assessment.

4.4.2 UEAPME Project “Quality in Apprenticeship in the European Union”

In Graz in 1998, the European Association of Craft, Small and Medium-sized Enterprises (UEAPME) with support from the European Commission established 11 quality criteria for vocational training in Europe. The aim was to gain an overview of the vocational education systems of the EU

member states not only in the interest of transparency but also to ascertain where and in what direction their respective systems are changing. This should improve methods of comparing different systems, and thus enable a reliable comparison of quality standards (Linderholm & Parker 2000). First, though, experts from each EU country developed their own benchmarking criteria (see Figure 4.3).

Subsequently, they developed the factual bases of the criteria from vocational education surveys, carried out an assessment, and gave the countries the opportunity to present their closing data in the final report. As expected, these assessments varied widely. Of course there are no data on Switzerland as it is not a member of the EU. We shall nonetheless attempt to make a quality assessment of the Swiss vocational education system using these EU criteria (see Figure 4.4).

Figure 4.3

UEAPME benchmarking criteria for vocational education systems

Criterion 1	Training in two places: in the company and at school. What matters for apprenticeships, unlike what happens in on-/off-the-job training, is that the training mostly takes place in the company and is completed with the necessary theory.
Criterion 2	The apprenticeship contract is the legal basis for the relationship of training in which social and working conditions are regulated.
Criterion 3	Fixed standards for the content of practice and theory, mutually complementary, are recognised at national level and are applied in the companies. Elaboration of these standards in cooperation with social partners and any public/private organisations concerned.
Criterion 4	Guidance and adaptation of training contents and methods in relation to technological and economic progress.
Criterion 5	The chambers, the sectoral organisations and other competent institutions ensure a significant part in the organisation of apprenticeship training, in advising companies and apprentices, as well as in the training of trainers (apprentice masters).
Criterion 6	Control of that part of the training that takes place in the company (and control of standards) to be exercised by the chambers or any other concerned institutions/control of

Figure 4.3 (Continued)

UEAPME benchmarking criteria for vocational education systems

	that part of the training that takes place at school to be exercised by the public authorities.
Criterion 7	Involvement of enterprises offering training in the financing of the practice part. The financing of the theoretical part is done by public financing.
Criterion 8	The training is ensured by qualified staff: for the practice in the company by trainers (e.g. apprentice masters), who fulfil nationally required conditions (qualification, experience, reputation...); for the theoretical part the staff is recruited on the grounds of criteria recognised at national level.
Criterion 9	Validation of skills at the end of the training by an exam organised with the participation of experts from the economic sector (chambers, professional associations etc.).
Criterion 10	A range of training which is accessible for people with learning difficulties as well as for very gifted people. The company is solely responsible for recruiting its apprentices.
Criterion 11	Integration of apprenticeship training in the national systems of training. Apprenticeship training is part of a training pathway, which can open access to continuing training (e.g. training of master craftsmen), and to higher education/university.

Figure 4.4

Assessment of the Swiss vocational education system based on UEAPME benchmarking criteria (cf. Table 4.3)

Criterion	Swiss assessment (Situation as it is)	Possible development trends envisaged in the BBG (Situation as it should be)
1	The backbone of the system is the cooperation between the two training environments. In spite of numerous efforts, it is poorly structured (cf. Dubs 2004a).	Cooperation must be better integrated in educational legislation. The first steps have been taken (e.g. re-organisation of commercial professions).
2	Sound legal basis.	Sound legal basis (Art. 14 and 18 BBG as well as Art. 8 BBV).
3	Standards fixed in training regulations (former BBG, Art. 12). Cooperation between social partners. Coordination of learning results.	Regulated in the educational legislation (Art. 19 BBG). Cooperation with sectoral organisations and chambers (Art. 1 BBG). Can coordinated educational standards be improved?
4	It was continuously subject to adjustment.	From a legal perspective, the open wording of the BBG and the BBV has made it easier to make adjustments.
5	Good level of cooperation with employer organisations. Apprenticeship training is legally prescribed (Art. 45 BBG).	No fundamental changes to be expected in this area.
6	The cantons are responsible for controlling vocational training, which is well organised throughout (Art. 24 BBG).	There is a legal basis for the implementation of quality management (Art. 8 BBG). As a matter of urgency, the OPET must issue framework guidelines for quality management.

Figure 4.4 (Continued)

Assessment of the Swiss vocational education system based on UEAPME benchmarking criteria (cf. Table 4.3)

Criterion	Swiss assessment (Situation as it is)	Possible development trends envisaged in the BBG (Situation as it should be)
7	The funding of schools is regulated (Art. 53 ff. BBG and 60 ff. BBV), and companies that take on apprenticeship must bear their training costs.	The BBG envisages a vocational education fund (Art. 60 BBG). It remains to be seen whether this solution will stand the test or whether further measures will be necessary (see Section 2.3, Chapter 2).
8	These requirements are met (Art. 45 ff. BBG).	There should be reflection on whether and how the training of vocational school teaching staff could be integrated in the framework of the Swiss teacher training reform.
9	Validation is regulated in principle (Art. 37 ff. BBG).	However, the examination systems must be modernised (both in terms of their development and content as well as their duration).
10	This criterion was previously met with the pre-apprenticeship. Today, the same is true for the two year training course and associated qualification – the federal vocational certificate (Art. 17 and 37 BBG).	Effective training models are to be searched for, and efforts must be made to convince industry of the socially political impact of this education.
11	Systematic efforts to ensure permeability (e.g. through the federal vocational certificate in vocational schools; access to third level education for holders of a professional baccalaureate).	However, the situation is not so straightforward. There is no discernible success in terms of permeability, due to a lack of motivation and a weak educational background.

According to UEAPME benchmarking criteria, the Swiss three-track vocational education system seems to perform very well. Therefore, formally at least, worries about the compatibility of the Swiss system with European standards are unfounded. The qualitative effectiveness of vocational apprenticeships would be of greater interest. Due to a lack of data, we shall outline the effectiveness of the different aspects of a modern occupation (Swiss polymechanics with German machine-tool and industrial mechanics).

4.4.3 Comparison of Swiss polymechanics with German machine-tool and industrial mechanics (basic vocational training)

By conducting a curriculum analysis, we should be able to evaluate initial vocational training provided by the dual system in Switzerland. First, training quality benchmarks which also take account of the requirements of the parties involved should be established.

These requirements allow us to deduce individual criteria for the curriculum analysis (see Figure 4.5), which reveal the link between the theoretical requirements of the different groups and concrete criteria. Admittedly, this statement should be qualified – only criteria, which could be implemented effectively by means of regulatory measures (regulations, curricula etc.) should be used. In other words, only components that also exist in the curriculum should be evaluated.

Furthermore, criteria may only be used if they can be made operational by means of indicators and then put into practice. Finally, the number of criteria should be restricted to ensure that the large quantity of results can be controlled and evaluated thoroughly.

Figure 4.5
Criteria matrix for the curriculum analysis

Criterion	Operationalisation
1 Up-to-date	<ul style="list-style-type: none"> • length of time the regulatory measures have been in existence • mechanisms for swift or permanent adaptation
2 Scope of training	<ul style="list-style-type: none"> • training duration
3 Content	<ul style="list-style-type: none"> • level of detailed learning content with the aim of ensuring high quality across the board • breadth of qualifications (occupation design) • precision and interlinking of content (sequencing and separation) • international aspects of the content (e.g. role of foreign languages)
4 Learning results	<ul style="list-style-type: none"> • detailing of learning results with the aim of ensuring high quality across the board • linking learning results with learning content • systematic development • classification of requirement levels • current design and permeability (e.g. comprehensive approach)

Figure 4.5 (Continued)
Criteria matrix for the curriculum analysis

5 Key qualifications	<ul style="list-style-type: none"> • value (quantitative and qualitative) • integration in a well-designed curriculum
6 Methods	<ul style="list-style-type: none"> • existence of indications, aids, recommendations for teaching staff
7 Accessibility for trainers and teachers	<ul style="list-style-type: none"> • clarity • intelligibility • existence of descriptions or examples
8 Differentiation (as to performance)	<ul style="list-style-type: none"> • existence of different levels • possibility to shorten/extend the training period
9 Individualisation and flexibilisation	<ul style="list-style-type: none"> • existence of electives • existence of additional qualifications
10 Links to further training	<ul style="list-style-type: none"> • existence of clearly regulated interfaces to further training
11 Preparation for higher education	<ul style="list-style-type: none"> • possibility of admission (e.g. Matura holders) • elements to prepare students for study at a third level institution (such as share of the general education content)
12 Role of the place of learning	<ul style="list-style-type: none"> • signs of cooperation between the school and firm • share/weighting of the influence of leaving qualifications • share/weighting of the certificate

We chose a vocational training course of similar design from Germany and Switzerland respectively. In both countries this course involves a great number of trainees, the occupation will probably also exist in the future, and its requirements are broadly defined. This would make it possible to transfer the findings of the analysis to other occupations. The Swiss profession of polymechanic corresponds most closely to two occupations in Germany, namely machine-tool mechanics (including pressing techniques and metal working) and industrial mechanics (including machine and systems technology).

1. A call for a topical standards

The regulations which govern vocational school curricula and the accompanying curriculum model for Swiss polymechanics date from 1997. In Germany, the regulations on machine-tool and industrial mechanics with the accompanying vocational school framework curricula came into force in 1987. Minor changes were later made to these regulations in 1996 and

2003. Therefore, the regulations in both countries differ in terms of the length of time that they have been in force. The 1987 German framework curricula are ten years older than the curriculum for the polymechanic vocational training course in Switzerland. It would be unfair to say that the German training regulations are more outdated than those in Switzerland, as they have been adapted to take into account modern machine technology such as CAD/CNC systems (cf. curricula for industrial mechanics, p. 36; machine-tool mechanics, p. 32). However, it should be noted that the Swiss curriculum appears to be the most up-to-date in that the regulations take account of recent sectoral developments. For example, the design of vocational training courses in Switzerland includes new fields of activity such as robotics. Furthermore, unlike the German legal bases, within the Swiss curriculum a strong emphasis is placed on quality management and business processes in the sense of client-supplier relations.

It should be noted that the standards for both German professions are currently being updated. The thorough revision of the curricula is due for completion in the near future. This has involved doing away with subject structure and is replaced by curricula which focus on work processes. Although the course content is defined in very abstract terms, these new curricula will enable those responsible to adjust the learning contents swiftly and permanently in accordance with technical and organisational changes.

2. Scope of training

Training duration for Swiss polymechanics is four years, while in Germany it is three and a half years for machine-tool and industrial mechanics. It is not possible to say that the Swiss curriculum is broader simply because of the extra six months' training. This can only be ascertained by taking into account the level of concentration in the teaching content (see the content analysis in the following Section). We can glean some indications about this rather theoretical area from the number of school hours/classes prescribed for vocational training courses. In Switzerland, these are 1800 at Level G and 2160 at Level E (cf. Section 8 for details on these levels). In Germany, regulations recommend 1020 teaching hours. The duration requirements in the German framework curricula only refer to occupation-specific learning content, which is completed by guidelines in the individual Bundesländer for general education (subjects, such as German, foreign language, politics, sport and religious studies). In Switzerland, the curriculum also directly incorporates general education subjects, such as technical English and sport. If these class hours are deducted, poly-

mechanics have 120 lessons in their chosen options, making a total of 1080 lessons for Level G and 1320 occupation-specific lessons for Level E. Therefore, only Level E has a significantly higher number of lessons.

To conclude, training in Switzerland which is six months longer and thus offers 15 % more instruction time may provide greater and more in-depth teaching, while affording weaker students more time to acquire the necessary skills and knowledge and better students more time to improve their skills and develop their own working routine (cf. also Point 8 below). General education is also of particular importance in all of the regulatory measures due to the statutory provisions of the Swiss BBG, and is highly uniform due to its standardised integration in the curriculum at national level.

3. Content

The level of detailed curriculum content in the Swiss and German regulatory measures which aim to ensure a high standard of quality are by and large the same. The learning fields for vocational instruction in the German framework curricula are substantiated by the teaching contents though, which is not the case for the Swiss objectives and aims which determine these contents (see p. 4 and p. 22f. of the regulation). However the learning contents for Swiss polymechanics are largely substantiated by means of the model curriculum (cf. *Swissmem* 2002, 30–37).

Use of the model curriculum (*Swissmem* 1999) also details the objectives and aims as set down in the basic training regulations, and defines them in relation to further training for the first time.

Both the German and Swiss occupations provide students with a broad spectrum of qualifications in the sense of comprehensive training which meets all occupational requirements. For example, the first year of vocational training focuses exclusively on the acquisition of fundamental knowledge, such as physics, materials' design, test and measurement procedures or environmental aspects.

It is interesting to note that the curriculum for Swiss polymechanics, as the name suggests, has a broad-based design and prepares students to exercise a range of activities, such as the design and construction of tools, instruments and machines, and the maintenance, as well as the planning and monitoring of production processes. The reason is that several individual occupations were amalgamated to form the present-day polymechanic. Training in Germany, on the other hand, has a slightly higher degree of specialisation, characterised by differentiated training occupations, hence the inclusion of two occupations for the purposes of this study. In their first year at vocational school, German students receive general,

basic training in working with metal, with more specialist training provided in the second year (the first six months of the second year is still the same for machine-tool and industrial mechanics). Then in their third year, students are able to specialise further in a particular area of their occupation (e.g. machine and systems' technologies for industrial mechanics). The main reason is that Germany has a large number of firms and therefore jobs in this sector, as well as a good supply of apprentices, facilitating greater specialisation in these fields. However, this does not imply that in the training of polymechanics in Switzerland company requirements are being ignored. After their basic training, Swiss polymechanics spend two years training in at least one specific area. Although structured differently from the German curricula, vocational training for polymechanics in Switzerland provides students with specialist skills and knowledge.

Both countries employ similar methods to ensure the precision and cross-linking of learning contents. Once students have acquired basic skills and knowledge in the first year, they move on to putting them into practice. It should be noted that students are afforded a certain degree of freedom and personal responsibility at this stage. Therefore, in both countries those who have successfully completed their vocational training are able to plan, implement and control work processes and projects independently.

Ever greater internationalisation makes it necessary to review training contents. To this end, both countries adhere to internationally recognised standards and quality benchmarks, as well as the provision of foreign language instruction. Polymechanics receive 80 lessons of technical English at Level G and 120 at Level E.

4. Learning objectives

The results of an analysis of learning objectives are closely linked to those on learning contents. In both countries, learning objectives are defined by learning contents. Since learning contents are developed thoroughly according to the concept of teaching self-contained, independent activities, of increasing complexity and the necessary prior knowledge, learning objectives are also determined in an equally comprehensive way.

In the German framework curriculum, performance requirements (for example ability to use equipment) are defined under the heading of "acquisition of skills and knowledge" and in the Swiss framework curriculum under the heading "learning objectives". In relation to the training of polymechanics, the targets and aims provided in the legal bases are also carried over into both the model and the actual curriculum. These become the learning objectives in the model curriculum (cf. *Swissmem 1999*, 3). Learning objectives for specialist options within the occupational training

course, particularly in the model curriculum, exceed the general specifications contained in the regulations. In addition, the model curriculum also takes into account project development skills by assigning apprentices increasingly complex tasks (Swissmem 1999, 7).

The Swiss curriculum differs in terms of fields of knowledge and skills, as well as exercises and activities. In addition, the requirement levels are classified into three categories: Level 1 – reproduction, Level 2 – transfer and application, and Level 3 – further development and generation. These are always assigned to learning objectives. Therefore, the Swiss curriculum is characterised by greater practical implementation of the learning objectives. Admittedly, a study of individual learning objectives in the German curricula reveals that there is a similar, albeit implicit, scale of requirement with almost identical contents to those for Swiss polymechanics.

Overall, the regulatory bases for the occupation stipulate a high degree of specialist knowledge, independent planning, implementation and monitoring, problem solving as well as process and integrated thinking. This means that holders of vocational qualifications can satisfy the requirements of both companies and higher education.

5. Key qualifications

Key qualifications¹ such as social and methodical skills have an important place in modern education and training. For polymechanics in Switzerland, these skills are integrated both qualitatively and quantitatively in operational processes. In particular, social skills in the form of cooperation with other experts as well as teamwork are an important and permanent part of their training (for example the Swissmem association developed a training concept for these key qualifications (cf. Swissmem 2002a), although these were not suitable for inclusion in the comparison of both training pathways). Also as part of their training, Swiss polymechanics have to understand that they represent the company; they learn to interact with colleagues; they are encouraged to offer their own personal input and to motivate themselves. These targets are clearly expressed in the regulations, as are the learning outcomes of the model curriculum.

Regulations for German apprentice machine-tool and industrial mechanics provide them with a certain knowledge of planning, execution and control, which is formulated in rather abstract terms, and the corresponding methodical skills. However, within the aims of the framework

¹ The curricula mentioned here are strongly geared towards key skills, although this concept continues to be criticised from a learning theory perspective (cf. Gonon 1996).

curricula social skills are addressed only in terms of corresponding attitudes and in the interests of balance.

Trainee polymechanics in Switzerland are required to be both independent and team-oriented. In this way, they have the necessary skills to exercise their activity successfully in the prevailing culture of a given business.

6. Methods

Indications and recommendations for teaching staff are not provided in either the German or the Swiss regulatory bases. However, both countries do offer abstract and practical guidelines, recommendations and learning materials. These are not examined in this study.

7. Accessibility for trainers and teachers

The attractiveness and scope of basic vocational education pathways depends on guidelines being accessible and comprehensible for firms that train apprentices, teaching staff and trainers (cf. Pilz 1999, 217f.).

The curricula in both countries differ in terms of the application of a wide number of specialist terms, which are almost incomprehensible for non-specialists. However, they provide clear references for teachers and trainers with the necessary expertise and prevent misunderstandings.

The Swiss model curriculum contains detailed descriptions or examples, while the design of the regulations is rather abstract. The German model is by and large the same. The regulations on job descriptions refer to the required skills and knowledge in abstract terms (e.g. manual metal-cutting). However, the framework curriculum sets them out clearly and precisely (e.g. metal-cutting is divided into the following activities: sawing of steel plates, slabs, pipes and profiles made from iron, non-metals and plastics using a manual hack saw).

Both the Swiss and German training bases are clearly organised. This means that each defines learning objectives according to the given year of study and training requirement levels. The German framework curriculum sets out the duration for each training component, while Swiss basic training regulations classify three requirement levels.

8. (Performance) Differentiation

Polymechanic training is divided into two requirement levels. Training at Level G (basic) and Level E (advanced). The more advanced performance required at Level E is reflected in the higher number of lessons. Since students can switch between levels up to and including the seventh semester, this regulatory structure takes into account the different abilities of individual students.

In Germany, differentiation of performance is shown to a certain extent in the possibility of shortening the duration of training, which is not the case in Switzerland. For the corresponding initial training and sometimes in terms of performance in the first year of training, the regular training duration of three and a half years for mechanics can be shortened in Germany to three years or two and a half for students with an Abitur (German high school diploma). However, students must first receive the agreement of their training firm and the relevant chamber. Also the training period can be lengthened if students have not been able to keep up with their training.

Thus Germany and Switzerland both offer possibilities to differentiate between levels of performance, but their methods differ considerably. The shorter training duration in Germany is an expression of the standardised minimum level of performance required of all trainees. However, the training duration in Switzerland is legally determined, so performance requirements are split into two levels. It is impossible to say which way is best. What is important though is the issue of whether apprentices who perform less well have equally good opportunities of employment as good students at an advanced level, and whether the development of a career of weaker students is not stymied prematurely.

9. Individualisation and flexibility

Neither German nor Swiss training has highly structured electives. Yet both take account of individualisation and flexibility by offering students the chance to specialise further (cf. Point 3 above). Furthermore, the different requirement levels for polymechanic training and the option to shorten training time for machine-tool and industrial mechanics (Point 8) can be considered positive.

The supplementary and further training offered in the model curriculum provides a framework which takes into account the consolidation as well as firm- and occupation-specific specialisation are taken into account. The acquisition of advanced qualifications, which are specified in the training report, is possible particularly thanks to optional advanced training, the contents of which are defined by firms.

None of the two occupations have this option in the German training system.

Only Switzerland has a true strategy to improve flexibility. Steps have been made in this direction in certain areas of vocational training in Germany (cf. Dybowski 2000). For example, in addition to the statutory basic training, electives were introduced for laboratory occupations (Pilz & Papenbrock 2001).

10. Links to further training

In terms of basic training, the transition to further education is not clearly regulated in either country. The regulations on polymechanic training state that apprentices should be properly prepared for life-long learning, considering it as a learning objective. In the German training framework curriculum for machine-tool and industrial mechanics, one learning objective is the possibility of further vocational training, as well as the fact that an apprenticeship qualification provides students with important prerequisites for embarking on further education pathways.

Similar to criteria of individualisation and flexibility (see Point 9), links between further and basic training are being established for other occupations in Germany, where a stronger interlocking between the basic and further training can be achieved thanks to a suitable regulation of curriculum and evaluation.

11. Preparation for higher education

The status and public perception of an education pathway often strongly depends on the possibility of being able to go on to higher education. In Switzerland, the professional baccalaureate is a way to provide talented young people with an attractive and future-oriented offer in terms of training as a polymechanic. Statistical data also support this. In 2001, just under 13 % of qualified polymechanics received not only a certificate of capacity but also a professional baccalaureate (Swiss Federal Statistical Office 2002).

The general education contents set out in Swiss regulations also prepare students for University of Applied Sciences programmes. The fact that the final examination covers general education and is even given double weighting, underlines its importance. In addition, the technical professional baccalaureate is important for school instruction of the curriculum, which codifies the additional contents and learning objectives for both general education and areas of technical/natural sciences, and places higher demands on the students.

Students acquire skills and knowledge, for example in the field of machine technology, and receive a good educational basis to enable them to take up an engineering course at a Swiss University of Applied Sciences.

In Germany, apprentices receive an intermediate qualification, should they not have already achieved this level in general education pathways. Entry to German Universities of Applied Sciences is only possible if students have had supplementary instruction in subjects belonging to general education and have passed their final exam. Otherwise, the transfer is possible and common if the student attends and passes a one-year course

at a technical college. General education is integrated in the final exams of the responsible authorities (here chambers of commerce and industry) in the form of economics and social studies, but it does not correspond to the scope of general education in the Swiss examinations.

12. Role of training places

Swiss legislation does not provide any detailed indications on the interaction between institutional and in-company training places. Since the final examination includes the marks given by the teaching staff during the year as well as an examination in general education, and all achievements are specified in an accompanying document, there is a close connection between learning places at the examination and certification levels in relation to the training of Swiss polymechanics.

The German framework curriculum takes account not only of defining the teaching to be given in the learning places in terms of the procedures between the training regulation for the firms and the framework curriculum for schools. At the level of technical examination and certification, the final examination is given by the relevant authority. This examination does not take school performance into account; this is shown in an independent school report, which is seen by many as a rather unhelpful construction that should be changed (BMBF 2003, 16f.).

Overall evaluation

An overall evaluation of findings on the training of polymechanics show that the education provided in the Swiss dual system is modern and comprehensive. It achieves a good balance between broad-based and occupation-specific training. The relatively long duration of training is also a contributory factor. The comprehensive work processes and the formulation of ambitious learning objectives meet the requirements which arise from the increasingly high demands placed on employees. At the same time, dividing training into two levels enables performance to be adequately differentiated. The transition to demanding higher education is made possible and justified by the particular importance given to general education, including foreign language skills.

Compared to Germany, Swiss vocational training seems attractive, modern, equal and sometimes even superior, in as much as trainees are awarded a certificate, performance is differentiated according to requirement levels, optional additional qualifications are well structured and there is a strong focus on social skills in addition to skills related to occupation.

Overall, by international comparison, the quality of Swiss basic vocational training is high. It is a sustainable and effective model of vocational education. It is also worth mentioning that it corresponds to many aspects of the expert model.

4.4.4 Job market transition and employability among polymechanics (CH) and machine-tool and industrial mechanics (D)

Based on the example of polymechanics again, this section shall examine the extent to which basic vocational education in the Swiss dual system corresponds to requirements in domestic labour market.

A comparison with machine-tool and industrial mechanics will also be made in full conscience of the fact that their situation is more difficult than that of their Swiss counterparts.

1. The transition from vocational training to employment among Swiss polymechanics

In August 2003, 624 polymechanics were registered as unemployed. Their previous employment involved an occupation in metal working (manufacture, machining or engine building) (SECO 2003). At the same time, 1157 job vacancies in this occupational group were advertised (SECO 2003).

Although only a small percentage of people who trained in this field, which includes polymechanics, were unemployed, the number of job vacancies was almost twice as high as the number of unemployed people.

We can conclude from this that almost all qualified apprentices are able to take up a professional activity either in the firm that trained them or another firm, and that this transition runs smoothly, though there are a few problems, such as regional search unemployment.

This observation is also confirmed in the recent Swissmem evaluation (2003) based on data from the Swiss Federal Statistical Office (SFSO). The report states that due to the economic downturn, the number of firms

which complained of a shortage in qualified workforce during the second quarter of 2003 reached an all-time low since 1996. In spite of these economic uncertainties, 13.2 % of all firms recorded a workforce shortage, while only 3.8 % recorded a surplus.

In Germany, 20 819 machinists were registered as unemployed in 2002, that is 8.6 % of all registered machinists, and 4327 trained instrument mechanics were unemployed, that is 3.5 % of all instrument mechanics (IAB 2003). According to a survey by the German Federal Institute for Vocational Education and Training (BIBB 2001), 14.8 % of those trained in machine construction/maintenance and 23.7 % in precision mechanics were unemployed during the 1999–2000 period.

2. Evaluation of the transition from apprenticeship to a professional activity

In spite of the tense economic climate, Swiss polymechanics still enjoy good employment opportunities. Employers recognise that they make for a highly qualified and employable workforce.

This statement is also true for Germany, in spite of the employment difficulties faced by machine-tool and industrial mechanics. For example, the 2002 unemployment rate among instrument mechanics stood at 3.5 %, significantly lower than the total unemployment rate in Germany, which was on average 9.8 % (by comparison, the Swiss unemployment rate was 2.5 % in 2002).

Generally speaking, a dual or three-track vocational education system adequately meets the requirements of the Swiss and German labour markets. This is confirmed by the unemployment rate according to level of education. In Switzerland, the rate of unemployment among people with university or equivalent training qualifications was 2.2 % in 2002, and 2.6 % among those with a vocational education or Matura qualification. In contrast, the unemployment rate among people without a post-statutory educational qualification was 4.5 % (Swiss Federal Statistical Office 2003a).

4.4.5 Conclusions

Of course, this comparison between Swiss polymechanics and German industrial and machine-tool mechanics is by no means representative of all professions. Structural economic requirements, the supply-demand ratio in the apprenticeship market, apprentice training strategies and legal framework conditions vary according to profession and country.

This field of activity was deliberately chosen for three reasons. First, prior to the reforms, metalworking trades in Switzerland were highly structured. The reforms centred more on occupational fields and reduced the number of trades requiring an apprenticeship. Second, the machine industry is not a particularly attractive industrial sector for young people (unlike IT, for example), which is why a well-designed curriculum of their basic vocational education is so important. Third and finally, many firms in this sector pursue an investment-oriented training strategy in spite of the current structural difficulties and difficulties related to the economic cycles.

Consequently, we are able to prove the effectiveness of the Swiss three-track vocational education system, even in trying circumstances, insofar as trade associations are willing to embrace reforms to increase the flexibility of the system. Likewise, the comparison proves that the Swiss system has the same, if not higher requirement levels as vocational education systems in other countries.

4.5 Swiss vocational secondary schools and the professional baccalaureate

4.5.1 Outline of the problems

Vocational secondary schools and their professional baccalaureate qualification are a peculiarity of the Swiss vocational education system (cf. Hässler 1977 for a history of its origins). Figure 4.6 provides an overview of the number of baccalaureate students over the years.

Table 4.6
Number of professional baccalaureate students

Year	
1998/1999	2083
2000/2001	3215
Source: Swiss statistical yearbook 2000/2003	

Vocational middle schools were created to motivate gifted secondary-school graduates to opt for the apprenticeship route. In addition to practical training, students receive supplementary instruction leading to a professional baccalaureate and thus are entitled to enter a University of Applied Sciences without an entrance exam. Students can choose between two paths: either completion of their vocational middle school education during their apprenticeship, or one-year full-time schooling at the end of their apprenticeship. Initially, there were many different arguments for and against the vocational middle school, the professional baccalaureate and the two learning paths. Advocates stated that gifted students in particular would be attracted by the apprenticeship option due to a curriculum that was systematically designed to prepare them for study at a UAS. Critics cited the increasing length of time professional baccalaureate students spent away from the work place. Furthermore, they claimed that there would be an increase in the net costs of vocational education for firms that take on apprentices, leading many of them to reduce their intake of trainees. Consequently, many (though not all) training firms preferred the option of full-time attendance at a vocational middle school at the end of the apprenticeship period. However, this solution was criticised on grounds of social policy, as vocational secondary school students would

unfairly bear the full costs of preparation for study at a UAS unlike their peers with a traditional Matura.

Further criticisms have been levelled at this system. Foreign observers doubt that this type of advanced in-service training course will equip students adequately to complete their education successfully at a University of Applied Sciences. Occasional criticisms from UAS lecturers bear out this concern. The most common are insufficient linguistic or mathematical skills. Furthermore, some companies continue to be less inclined to allow their apprentices to take up this option of in-service training at a vocational secondary school.

In Switzerland, there is a regrettable lack of systematic studies which provide sound conclusions on the quality of the professional baccalaureate per se and in international terms. Although Metzger, Dörig & Waibel (1998) carried out an analysis of the professional baccalaureate examinations, their conclusions are limited to formal proposals for improvement, from which it is impossible to deduce any indications of quality. Therefore, we undertook a quality assessment based on interviews with directors and heads of department in the UAS and a comparison of randomly selected exam papers.

4.5.2 Cost-benefits of the professional baccalaureate

Wolter & Schweri (2004) were the first to examine this issue and they arrived at the following conclusion (p. 28): “We can conclude that on balance neither costs nor benefits are particularly affected by the professional baccalaureate. The somewhat higher gross costs shown by firms with a large share of professional baccalaureate students can also point to the fact that these firms provide more cost-intensive training. The similarly high returns on the services provided by apprentices result in longer absences from their firm, but this situation is compensated by the sometimes greater share of demanding activities they carry out (particularly at the end of the apprenticeship) and higher productive output. In relation to four-year apprenticeships especially (generally more intensive with aspect to human capital), apprentices in their final year of training in a firm with a high intake of professional baccalaureate carry out more demanding activities and have a higher productive output.”

In addition, Wolter & Schweri (2004) noticed that the share of students who remained with their firm one year after completing their apprenticeship is significantly higher than among traditional apprentices. Interestingly, the same is also true three years after completion, albeit not signifi-

cantly lower than for apprentices who did not attend vocational secondary school. However, by this point many professional baccalaureate students have already transferred to a UAS. This leads us to conclude that perhaps those firms which invest heavily in apprenticeship training are better at fostering loyalty among their apprentices. Firm loyalty also reduces ever more expensive recruitment and training-up costs.

It is also probable that holders of a UAS degree tend to return to the firm where they carried out their apprenticeship.

The work of Wolter & Schweri (2004) document that firms with a high number of professional baccalaureate students who are also attending school at the same time do not show *a priori* a less favourable cost-benefit ratio than firms without such students. This is particularly the case if the firm's training strategy is less production-oriented.

Based on these findings, vocational secondary schools and the professional baccalaureate are fully justified from the firms' perspective. However, it is more difficult to say whether the professional baccalaureate equips the holder with sufficient knowledge and ability to study at a UAS.

4.5.3 Vocational secondary schools and the professional baccalaureate according to an assessment by UAS directors and heads of department

The results of a telephone survey among UAS directors and heads of department on the quality of Vocational secondary schools and the professional baccalaureate were widely consistent.

The design of the curricula was generally judged to be good. In particular, many interviewees were positively impressed by efforts to make them more application-oriented (instruction based on problem-solving). Instruction in general education and the preparation of students for further education were deemed adequate. However, none of our interviewees saw the need to change the system (shift to a purely school-based preparation for the professional baccalaureate).

The majority of interviewees levelled the following criticisms. They felt that not enough emphasis was placed on students' basic skills in their first language and in mathematics. They considered the level of mathematical skills of students entering UAS as inadequate. Directors and heads of department also criticised instruction in science, which they felt relied too heavily on practical experiments. Instead, they would like to see students being given a fundamental basis in these subjects (similar to the proposition of Wagenschein, 1973). In relation to business studies and econom-

ics, teaching contents were too strongly aligned to UAS teaching contents. Many interviewees were also of the opinion that greater emphasis should be placed on the acquisition of basic accounting skills.

The professional baccalaureate examinations are organised according to the principle of “wer lehrt, prüft” (he who teaches, examines). As a result, there are ever greater differences in the performance of baccalaureate students depending on the school they attend. Interviewees suggested that measures should be introduced to improve the comparability of the professional baccalaureate, though they stopped short of calling for a centrally organized examination.

Overall, UAS directors and heads of department did not see the need for fundamental changes to the current system of the vocational secondary school and the professional baccalaureate.

4.5.4 An input evaluation of the Zurich University of Applied Sciences of Winterthur

The Zurich University of Applied Sciences of Winterthur commissioned Rhyn & Moser to carry out an input evaluation (Rhyn & Moser 2001). The aim was to answer four central questions: 1. Does the input from professional baccalaureate schools correspond to the demands of the Engineering Department of the UAS in Winterthur? 2. Is there a difference in how students with a professional baccalaureate and those who have taken preparatory courses and have passed the UAS entrance examination perform in algebra, geometry, physics and German? This question was studied because, prior to the introduction of the professional baccalaureate, many lecturers felt that new students did not have a sufficient basis in subjects pertaining to general education. 3. Does the performance of professional baccalaureate students differ, depending on the school they attended? 4. Does performance differ between students with qualifications from a lower intermediate vocational school (in-service training during the apprenticeship) and those from an upper school (employment following the final apprenticeship exam)?

This type of survey has two fundamental problems. The first concerns establishing the level of requirements level expected of new students. For the purposes of this study, lecturers from the Winterthur UAS determined these levels according to those envisaged by their institution. Admittedly, this procedure has certain disadvantages: lecturers tend to set the levels too high. Some students always perform poorly in the first semester tests,

thus disqualifying themselves from further specialist education. When students are tested within such a study, they often lack the motivation to perform well in the examination. Finally, to achieve a better comparison of student performance, researchers would require access to tests given by other UAS (Rhyn & Moser 2001). The second problem concerns the calculation of the test results. For example, the average number of right answers is calculated (number of correctly answered questions as a percentage), the advantage of which is that it is straightforward and easy to follow. The disadvantage is that it does not allow for a qualitative assessment of the performance levels. Another example would be the construction of a scale which ranks exam questions according to difficulty and would be by and large the same for everyone. This would enable the test results of individual students to be attributed to the level of qualitative requirement.

We cannot go into the results of the study in detail here. However, they can be summarised as follows:

1. The performance of new students significantly falls short in all four subjects (algebra, geometry, physics and German). Overall, between a mere 0 % (geometry) and 4 % (German) fully meet requirements.

It should once again be noted that teachers from continuative schools always set rather unattainably high requirements. Also, since the 2001 study, professional baccalaureate guidelines have been comprehensively revised and the performance level of new students has probably improved in the interim.

2. Students with a professional baccalaureate and those who attended preparatory courses and passed the UAS entrance examination had the same performance level in algebra and German. However, students with a professional baccalaureate tended to perform better in geometry and physics. It is not possible to draw any conclusions here on the entrance examination, as additional factors such as gender and UAS department have a bearing on the results. The different learning contents of both training paths probably also affect the results.
3. Performance in all four subjects did not vary with respect on the vocational school which awarded the professional baccalaureate. This indicates that there has been a uniform implementation of the curricula of the professional baccalaureate by all vocational secondary schools. This result also shows that calls from individual UAS directors and heads of departments to improve the comparability of professional baccalaureates are misguided. However, it would be safe to say that professional baccalaureates awarded by schools in rural areas probably vary widely.

This was not the case for vocational secondary schools in the area around Winterthur.

4. There are no differences in the performance of students from lower and upper Vocational secondary schools. We can conclude then that it is erroneous to claim that the in-service training provided in a vocational secondary school inadequately prepares students for attendance at a UAS.

Although this study showed that some holders of baccalaureate performed badly, we can still not say for certain that students from a vocational secondary school are ill-prepared to study at a UAS. The reason is that it was not possible to carry out a clear and in-depth study of the interface between the vocational school and the UAS. If UAS lecturers set unrealistic levels of requirements, results will inevitably be poor. It is not clear whether this is the case here. One thing is certain: there are discrepancies between the ideas of lecturers from the Zurich University of Applied Sciences and the objectives of a vocational secondary school.

As a result of this study, one important **requirement** must be met:

There is an urgent need for better coordination between vocational secondary schools and UAS. Both sides should discuss this situation regularly and purposefully and all parties must be willing to make certain compromises.

A result, which is only mentioned fleetingly in the report (Rhyn & Moser, 2001, 37), is worthy of greater attention: **students with a professional baccalaureate and those with a Matura from a full-time secondary school perform the same in all four subjects**. This corrects the misconception that only a purely school-based, full-time education can prepare students sufficiently for the intellectual demands of a UAS course.

Finally, it is interesting to see how lower secondary level qualifications (for example Progymnasium, secondary school, Realschule, additional year at secondary school) affect the performance of students at UAS. If we compare test performances, no significant differences exist across three subjects (algebra, geometry and physics). This means that any deficits which the students may have at the end of their lower secondary education (statutory education) are overcome during their apprenticeship and through their attendance at a vocational secondary school. The differences

in performance between students with a German Realschule diploma and those with a Swiss lower secondary school Matura exist only in relation to the German language exam. In relation to first language skills, it is widely accepted that deficits cannot be balanced out over time (Rhyn & Moser 2001). This is particularly important when justifying the vocational secondary school and its dual training for reasons of social policy. If it is true that the performance of vocational secondary school graduates at UAS is the same regardless of the quality of the school, this means that apprenticeship training and experience provide weaker students with the opportunity to acquire third level qualifications. The vocational secondary school system and its professional baccalaureate qualification offer students, who do not like school or perform badly and as a result cannot or do not want to attend a continuative school, the chance to overcome their learning deficits accumulated by the end of the lower secondary level. Of course, this situation also benefits considerations of social policy.

4.5.5 A comparison of UAS entrance examinations

Holders of a professional baccalaureate in Switzerland and the final technical college examinations (Fachoberschule) in Germany can gain entry to a UAS. However, it is of particular interest to see whether these exams are comparable in terms of their inherent requirement levels, since many believe that holders of a Swiss professional baccalaureate are insufficiently prepared to study at a UAS. As it was not possible to investigate individual issues in-depth in the framework of the present study, we selected the following points for closer examination. Besides focusing solely on commercial training, which is an important and similar field in both countries, examinations from the 2000–2004 period were also taken into consideration. To this end, we looked at examination questions from a canton in Eastern Switzerland and from parts of Niedersachsen in Germany.²

We also limited our comparison to the written examinations in the main subjects of German, English, mathematics, accounting and business studies, because the legal position in Niedersachsen does not provide for oral

² In the following study of examinations in Germany, all observations are based exclusively on the current legislation in force in the German Land of Niedersachsen (legal basis – BbS-Vo of 2003). The differences with other German Bundesländer are limited since the Cultural Ministry Conference has provided for the statutory recognition of minimum examination requirements, which are applicable in all the Bundesländer.

examinations in these subjects. The Swiss commercial professional baccalaureate, on the other hand, involves a written French test, which can take the form of a recognised language diploma (issued by another awarding institution).

An analysis and a comparison of the examination questions provided the following results (presented according to subjects of examination):

German (first language): The Swiss examination involves both comprehension and interpretation skills. It also tests for correct spelling and use of grammar, including syntax. Style as well as the correct use of words of foreign origin is also important. In addition to a 60-minute language test, students have 90 minutes to write an essay on a complex topic, chosen by the student from a long list.

The first language examinations in the German higher technical colleges consist of a reference text, which can be literary, a passage from a manual or a newspaper article. To evaluate their comprehension skills, students generally have four hours to reproduce the text in their own words. The second part generally involves a stylistic analysis of the text. The third part involves essay writing, e.g. students are required to discuss a topic dealt with in the reference text.

A comparison of both examinations shows that in spite of the longer examination time in Germany, both have high levels of requirement. The first-language examinations in Germany have an integral design, whereby only one reference text is used to assess the students' comprehension, as well as their analytical and verbal skills, including correct spelling and use of grammar. In Switzerland on the other hand, the German examination is divided into two parts, which test the students' passive and active language skills (written text analysis and oral exam respectively). The Swiss exams test students' knowledge of formal grammar (case, tense, sentence construction) in clearly targeted problem sets, unlike the first-language exams in Germany.

Accounting: The written accounting examination in Switzerland lasts three hours and covers the entire breadth of the subject. Students must transfer various transactions into records and enter them into the correct accounts. This exercise also covers various levels of difficulty. For example, in addition to simple accounting sales transactions, students are also required to make extensive entries on VAT input, credits and interest rate calculations or reductions. They also have to close accounts, establish final balances and draw up profit and loss accounts. The levels of difficulty rise, as more specialised sub-areas are included in the examination. These include aspects of purchase and retail price calculations as well as factoring in social contributions when drawing up the wage accounting. Final-

ly, students must make extensive calculations in cost-accounting and amortisation.

The German accounting exams are organised differently. Since accounting is an integral part of the five-hour written examination in business studies and accounting/controlling, no exact time duration is set for this subject. Overall, the share of accounting in German exams seems to be much lower. They also cover accounting transactions from simple to complex that also have to be entered. They often involve calculations in amortisation and wage accounting as well as tax calculations with the associated accounting transactions.

Overall, German and Swiss accounting exam questions have a similar degree of difficulty, although they are quantitatively less important in the German examinations. Therefore, students' abilities and knowledge are only partially tested.

A striking feature of the Swiss examination design is the wide range of skills which are tested. Starting with simple, rather recapitulative accounting records to the application of substantial valuation and accounting techniques, right up to the analysis of and reaction to complicated accounting transactions, students are tested at different levels of difficulty.

Integration subject (business studies part): A feature of the Swiss commercial professional baccalaureate is the integration subject, which covers business management, economics and law, as well as information/communication/administration. The written examination is intended to last 210 minutes. Since German regulations provide for a written examination in a business studies course which is linked to accounting/controlling (see above), we shall only examine the business operations/law-related questions here for reasons of comparability. Examinations generally last 110 minutes.

This part in the Swiss examination is generally characterised by the use of a complex case study, which acts as a reference and provides the bases for the examination questions.

These questions cover different areas of business studies. For example, to test their knowledge of strategic and financial business management, students are required to calculate operating figures, as well as to make the necessary strategic decisions and justify their reasons for doing so. Students are tested on their knowledge of contract law and business organisation. They also must reproduce legal texts correctly and appropriately. Marketing is also part of the exam. Students are asked to show their knowledge in this area by explaining the development potential of a given marketing strategy and how it should be implemented.

The German examinations on business studies and accounting/control-ling, which are planned to last four hours (no fixed examination time attributed to these subjects), rely more heavily on case studies, although these vary in scope and number according to examination. A sample of recurrent examination contents is only drawn up on a provisional basis. Students are often tested on profit ascertainment as well as capacity planning calculations. However, given the scope of business studies, the relevant sections of the exam are highly selective and focus on in-depth problem areas. So, for example, there are business studies exams which deal exclusively with marketing, albeit in many different ways.

Exams in both countries require students to answer highly complex questions, to use integrated thought processes and show ability to link up the different components involved in this specialist area. Students are also evaluated on their capacity to reproduce and apply their specialist knowledge, and to analyse and assess economic issues.

As the name suggests, the “business operations/legal applications” part of the Swiss exams concentrates on legal/contractual issues. The German exams do not go into as much detail.

In terms of the ratio between the tasks to perform and the time dedicated to this end, the time given to Swiss business studies exams is significantly shorter, and thus renders the exam more difficult in terms of the students’ ability to cope with the pressure and manage their time (this is also true considering that in Germany business studies and accounting exams are allocated a total of 240 minutes, while in Switzerland the exam generally totals 290 minutes, as each subject is examined separately). In the same way as accounting exam questions, this statement must be qualified – some of the Swiss questions are much more narrowly formulated and thus more objective-oriented, which should save time and prevent students from unduly panicking. The greater directness of the questions in the German business studies exams places high demands on students to understand the question correctly, and to structure answers thoroughly and in a streamlined manner.

Mathematics: The mathematics exam in the Swiss professional baccalaureate lasts two hours. Students must solve linear functions and sets of linear equations, questions on roots and exponentials as well as quadratic equations. The answers are either straightforward solutions of an equation or are integrated in a problem, which generally refers to an economic issue.

In addition, students have to answer questions on linear optimisation, which are presented in the form of a wide battery of questions and thus require processing steps and sub-calculations. Students are required to

generate graphic solutions by plotting curves and intersection points in two-dimensional diagrams.

The exam ends with specific commerce-related questions, where students are asked to perform calculations in financial mathematics (calculating interest rate, addition/deduction of accrued interest rate).

German mathematics exams total 180 minutes. During this time, students have to carry out a range of curve sketchings, calculate cost and profit functions as well as solving other sets of equations and optimisation tasks. Some of the questions also require students to solve the problem graphically. At the same time, questions on financial mathematics are integrated in the formulated question. In addition, the German exams require students to answer a large number of questions on probability calculations and some on descriptive statistics.

Considering the differences in terms of time appointed for the examination, the Swiss and German tests in fact do not differ in terms of their scope and level of difficulty. Admittedly, the Swiss exam tests the basic mathematical knowledge of students (e.g. in a separate section, while this is treated in an integrated and selective way in the German exams. On the other hand, more weight is given to probability calculations and (sometimes) statistics in the German examinations than in the Swiss ones.

English: The Swiss regulations have a special feature with regard to English in that students can satisfy requirements by either having a language diploma that is recognised by the federal professional baccalaureate commission, or must sit a 200-minute school examination that includes both oral and written tests.

Since students generally have a language diploma which they obtained from one of several recognised institutions, it is difficult to make comparisons. Since the diplomas recognised in Switzerland are aligned with the Common European Framework of the European Council (cf. Federal Professional Baccalaureate Commission, 2003), a comparison is only possible if we use the set requirement levels of language diplomas. For English, students are required to attain Level B2.

The written English exam in Germany lasts 180 minutes. The main part consists of an English text, usually on an economic topic. Questions relate to comprehension and interpretation of the text. Answers must be given in English. Students also must write an essay, in which special attention is given to written expression, as well as to the correct use of vocabulary/terminology, spelling and grammar.

It is interesting to note that in Switzerland the evaluation of this subject, which is an area of competence attributed to the schools, can be outsourced. This makes it difficult to draw direct comparisons with the pure-

ly school-based exam in Germany. Nevertheless, we can observe that Level B1 corresponds to the demands of the English exam in German schools and thus the same level of competence is required in both countries.

From this comparison, we can arrive at the following **conclusions** on the Swiss and German entrance examinations to UAS:

Overall, the written professional baccalaureate and the higher technical college certificate do not differ significantly.

Both deal with different subjects comprehensively and always to an equally high level of requirement. The reproduction and application of knowledge is tested, as are the comprehension of facts or mathematical problems and the generation of and reflection on independent problem-solving techniques. The fact that the time given to these exams sometimes differ affects the breadth of knowledge examined, but in general it does not have any significant bearing on the level of difficulty of the questions asked.

Exams in both countries differ in terms of content. In Switzerland, French is subject to a compulsory written test (also possible through a language diploma), the reason for this being that French is Switzerland's second national language, and is thus not considered simply as another foreign language, as is the case in Germany. Besides, Switzerland has its own independent written exam on information and communication, for which there is no equivalent in Germany.

The mathematics exams also differ. Only the German exams involve calculations in statistics and probability. Swiss exams give particular weight to legal aspects, such as accounting-related issues.

To summarise, questions in Swiss exams are generally more formal, more concrete and often knowledge-based (basic skills and knowledge are subject to compulsory examination), while those from Germany have a stronger economic link and tend to be more open-ended.

These more open-ended questions may mean that students pass exams in specialist areas, even though they clearly lack the basic knowledge. Of course, we cannot assume offhand that the skills' profile of students is narrower because they do not have to contend with as many concrete basic questions as their Swiss peers. This depends on what contents are taught and how extensively they are taught, as well as on the question, whether teaching staff how restricted teaching content to those areas which would be examined, or indicated to students what the exam content would be. If this is not the case, German students should also have a comprehensive breadth of basic knowledge and skills, because they are tested comprehensively on all aspects of business studies in their examination.

Finally, we should mention that a direct comparison of evaluations and marking, which lead to the entry to a UAS could not be carried out, since this would require a detailed analysis of concrete corrections, evaluations and marking of individual exam answers; this was beyond the scope of the present study. In view of the partial weighting of questions and the model solutions, which must be developed when drawing up exam papers, no great differences between the German and Swiss examination requirements or peculiarities could be ascertained.

In relation to the question asked at the beginning, Swiss examinations have more or less the same level of difficulty and content as the German examinations in terms of qualifying students for UAS courses. Based on available information, Swiss exams do not appear to be significantly less difficult.

All findings lead to the conclusion that the Swiss professional baccalaureate model does not have any serious shortcomings. Furthermore, they do not support claims that holders of a professional baccalaureate are ill equipped to cope with the intellectual demands of a UAS degree course. It should be checked particularly with regard to the profile demand in mathematics, although the comparison of the commercial professional baccalaureate with the German technical college diploma confirmed that the level of difficulty in mathematics is more or less the same (although the contents in Switzerland may be somewhat narrower in scope).

In addition, the expert model provides a possibility of consolidating the vocational secondary school system by introducing a specialised apprenticeship (see Section 3.2.1, chapter 3).

Overall, the vocational secondary school and the professional baccalaureate are a pragmatic solution and are in keeping with the three-track vocational education system. The rising number of students should confirm this.

There are two more proposals to make vocational secondary schools and the professional baccalaureate less rigid without fundamentally changing the system.

4.5.6 Two proposals to improve the flexibility of Vocational secondary schools

In relation to the duration of study at UAS (cf. also Section 5.5.3, Chapter 5) Kummer & Jaag (2002) propose the greater alignment of the professional baccalaureate to UAS degree programmes, thereby considering it as the basis for a Bachelor degree. As a result, the current professional baccalaureate would cease to be a simple requirement for entry and would be considered as the first module of a UAS education. However, we suggest doing away with the vocational secondary school and replacing it with a new type of pre-Bachelor study programme at the UAS. Entry requirements would no longer be the professional baccalaureate but an entrance examination. Apprentices could undertake this pre-Bachelor study programme as part of in-service training, which they would complete at the same time as their apprenticeship. This would shorten the duration of the Bachelor degree course to two years.

Although these solutions would shorten the duration of study at the UAS, we recommend not to use them for the following reasons:

1. The difference between the general aims of the vocational secondary school and UAS are too great. In order not to have a mere formal re-design, the initial study should be aligned to the needs and demands of the UAS. An important task of the vocational secondary school is to provide students with a consolidated general education as a prerequisite for life-long learning. Solutions should be avoided which would call into question the facilitated transition to university for professional baccalaureate holders, as occupation-specific specialisation would no longer qualify students for UAS entry.
2. The design of instruction at vocational secondary school (developing students' preparedness for third level education) obeys other rules than those of the UAS (research-based learning), leading to diverging pedagogical approaches.
3. Other countries would probably cease to recognise Swiss UAS diplomas at the Bachelor level on the grounds that it falls short of the UAS basic education requirements.

In the interests of making education more flexible and promoting equal opportunities, there are growing calls for a credit system in German vocational schools which would be recognised by UAS (press release of the Federal Ministry for Education and Research of 4th November 2003: "Berufsausbildung soll auf das Hochschulstudium angerechnet werden").

This proposal would not be advantageous for the following reasons:

1. Vocational secondary schools should adequately equip students for UAS degree courses. Therefore, their learning contents should not mirror that of the UAS; the credit system might create a situation in which the learning contents of these schools and the UAS might overlap.
2. Even if it were possible to make certain adjustments to the learning contents of individual sub-areas, problems would arise for both schools in relation to determining the levels of courses.
3. A further problem with such a credit system is related to administrative issues. A modularised system would reduce the administrative burden, but would give rise to a unilateral modularisation of basic education, which would not be a positive development (see argument Section 3.1, Chapter 3).

To summarise, there is no justification for even a partial change in the existing vocational secondary school model and the professional baccalaureate. A credit system for entry to a UAS would not be in the interests of Swiss vocational education.

4.6 ECVET: European Credit Transfer in Vocational Education and Training

As part of the Bruges-Copenhagen process, a working group was commissioned to investigate how to promote transparency, comparability, transferability and recognition of competences and/or qualifications between countries and across levels through the development of reference levels/benchmarks and joint bases for examination and vocational education measures (BIBB 2003).

The aim of this working party was to present the European Commission with ideas in three areas by early 2004, which could serve as a basis for effective solutions:

- a) a proposal for joint reference levels/framework for vocational education and training (VET),
- b) a range of bases for the development of a credit transfer system in vocational education,
- c) a practicable definition of *credits*, which also serve to integrate learning outside the formal qualification system.

The background to the ECVT is the broad and varied area of mobility: geographic and transnational mobility, transfer between educational areas in any national system, between the different learning structures, between working and training phases. It is therefore incumbent upon university management teams to undertake a similar development, which will entail greater problems and difficulties. The areas of vocational education and training cover a large number and wide variation of institutions in every country, different legal bases for vocational education, and various special features in terms of the general recognition of vocational education as well as different traditions.

It was not possible to examine the ECVET in detail, as no information was available during the course of this study. However, we can say the following:

1. There have been four attempts to develop a joint European reference framework (1985 EU Levels, combining criteria for education and skills; ISCO 88 and ISCO plus, a classification of occupations and occupational groups; 2002 EU benchmarks for the recognition of vocational qualifications 2002 as well as ISCED 1997 which were not specific as

to occupation). At the moment, it is still not clear whether this framework of reference provides an appropriate basis for a credit transfer system. Therefore it comes as no surprise that the working group has recommended that a new coherent European meta-reference framework for credits and qualifications is developed by 2010.

2. In a credit transfer system, there must be a clear definition of the teaching units, modules and measurement units, which are attributed credit points. This will ensure the international applicability of these credits, though will be a very difficult undertaking.
3. It is clear that the successful implementation of the ECVET would have a decisive impact on the vocational education system of any one country. The question then is how Switzerland should react to this development.

The response is **clear**:

- The development of the ECVET must be monitored closely.
- For the time being, no measures should be undertaken. First, the development of the ECVET is wrought with difficulty, and it would make little sense for Switzerland to introduce measures based on vague premises. Second, there are more pressing problems to be solved in relation to the Swiss vocational education system.
- All efforts should be concentrated on further improving the quality of the Swiss vocational school system. The question here is whether the greater level of bureaucracy in European education will contribute to an improvement in quality in the longer term and whether from a political perspective too much importance is placed on international mobility particularly in basic vocational education and in less demanding occupational fields?

Chapter 5:

Swiss Universities of Applied Sciences (UAS)

5.1 Short overview of previous developments

The UAS law of 6 October 1995 (FHSG) launched a process in which the former Swiss engineering colleges (HTL) and business administration colleges (HWV) that had been tried and tested were transformed into UAS. This process terminated at the end of 2003 with the recognition of seven UAS offering approximately 200 courses.

Pursuant to Article 24 of the FHSG, preliminary work for this process was executed by the FCUAS planned with and monitored by the OPET. It was based on the objectives established in the appendix to the UAS decree of 11 September 1996 (FHSV) for the preparatory phase of 1996–2003. The objectives included (among others) the regional and supra-regional consolidation of existing educational institutions (component schools), the establishment of comprehensive fields of study and core research areas, a division of tasks, and cooperation between traditional academic institutions and UAS, extended application-oriented R&D, greater knowledge and technology transfer, and measures to ensure equal opportunities for men and women.

In the 1996–2003 period, the FCUAS worked according to a strict timeframe and a clear list of priorities. The highest priority was of course the constitution of the UAS system in Switzerland. Originally, there were two conflicting opinions on this issue: one was to close down certain institutions which did not meet the requisite quality criteria, or the consolidation of all existing higher vocational colleges within seven UAS, in which they would function as component schools under unified management. It soon became apparent that the solution providing for the concentration of a few good schools and closing down of the others was not operational, for two reasons. First, there was a lack of definite criteria for quality. The rankings of higher vocational colleges proved unreliable, based on few criteria, and often external ones, as a result of no scientific definition of quality as applied to schools. It may not be possible to establish such criteria in the future either: besides purely educational aspects, normative and political ones will also have to be accounted for (see Dubs 2003). Second, considerations of regional policy restricted the closing down of school. Understandably, the peripheral regions fought hard to get their own UAS. Thus, the solution adopted was to consolidate and integrate existing schools within seven UAS. The implementation of this decision – which in retrospect proves to have been the right one – nevertheless posed certain problems. Various stakeholders in the new UAS system had difficul-

ties deciding between *strategy before structure* or *structure before strategy*. It would have been correct to first define a strategy (particularly to decide on a specialisation and then to adapt the structures accordingly). Unfortunately, political considerations (demands by regional policy, attention to minorities, difficulties to adapt previous agreements) gave rise to long discussions on structures, with a resulting loss of interest in specialisation. It also proved difficult to define the competencies of the Confederation and the cantons. Also for financial reasons, the federal authorities should have stepped up the specialisation process for the Swiss UAS system, which is still too disparate. There are too many traditional courses (e.g. architecture), while innovative curricula are insufficiently promoted, due to a lack of funding. In the present state, the extended mandate of the UAS pursuant to Article 6 of the FHSG cannot be realised everywhere, which is bound to generate growing differences in quality between individual UAS and courses. The Confederation could not assume full strategic leadership, since the cantons were wary of losing their autonomy, arguing that as they were the more important financial backers they wished to make fundamental decisions themselves. Finally, although modern organisational, financing and management principles were constantly invoked (often in line with New Public Management principles), the legal and conceptual conditions for their implementation were lacking, complicating matters above all for school directors.

As a second priority the FCUAS tackled the issue of quality management and the accreditation of UAS and their courses. Aiming for rapid results, it independently decided to introduce formal evaluation of the development of the seven UAS and a Peer Review to assess the quality of individual courses (see Section 5.2 in this chapter).

The third priority of the FCUAS was the setting-up of national centres of competence and competence networks. Centres of competence would enable individual UAS with selected courses to excel in certain areas, with federal funding and as part of their legal mandate. Networks would reinforce cooperation in specific fields not only between UAS, but also with domestic and international universities. It soon became clear that competence centres and networks require federal backing and strategic leadership. Thus, in 1997 federal legislation instructed the Swiss Innovation Promotion Agency (CTI) to launch the necessary measures, which are continued to the present day. The CTI opted for application-based research funding. Table 5.1 gives an overview of how research applications and funding have evolved.

*Table 5.1***Research applications and funding by the CTI for UAS**

Year	Approved applications	Total sum (CHF)
1998–2001	310	3,341,000
2002	96	19,985,786
2003	155	32,191,923
Source: CTI/OPET		

These data document the importance of CTI research funding for the Swiss UAS system. The interest in competence centres and networks was also strong. Within a short period 205 applications were submitted, including 95 by prospective leading houses. Table 5.2 gives an overview of the status in March 2004.

*Table 5.2***UAS competence network**

<ul style="list-style-type: none"> – Intent (national competence IT network) – Planet (integral production and logistics) – Wood network – Biotech net – Academy (Applied Sciences for E-Business and government) – brunet (building and renewable energies technology network) – amine (Public Management competence network) – Magnet (materials technology competence network) – Swiss Food net (national food sector competence network) – Micro Swiss Network
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These competent networks are approved every three years.

5.2 Quality management in Swiss UAS

5.2.1 Overview of the evaluation procedure

When designing the UAS, the FCUAS was very attentive to quality management in the individual schools and courses, particularly owing to doubts from abroad whether the transformation of the higher vocational colleges to UAS would not lead to a simple continuation of advanced vocational training without the requisite academic level. It therefore evaluated the UAS creation process by means of the instruments presented in Table 5.3.

Table 5.3
2000–2003 evaluation

Timeframe	UAS	Individual courses
Until January 2001	Report of each UAS concerning overall development and development of individual courses	
February through August 2001	---	Peer-Review (called Swiss Peer Review)
November and December 2001	<ul style="list-style-type: none"> – First formal review – Meta-evaluation based on a comprehensive list of criteria 	---
April through June 2003	<ul style="list-style-type: none"> – Second formal review based on the results of the first formal review and a new list of criteria 	Simplified second Peer-Review
<p>This procedure can be characterised as follows:</p> <p>Self-evaluation reports: On the basis of a FCUAS instruction, the UAS systematically and independently collect data which they reflect upon critically and compile in a report addressed to the OPET and the FCUAS.</p> <p>Peer Review: On the basis of the self-evaluation report on a study programme, a group of experts (peers - usually one Swiss and one foreign university professor, one UAS representative and one Swiss and one foreign practical expert) make visit on-site. They then write a Peer Report, which is submitted to the schools with recommendations and is used by the OPET and by the FCUAS as a decision-making basis for application to the Federal Council to recognise individual programmes.</p> <p>For the Swiss Peer Review, over 600 specialists took part in an introductory event evaluating all 220 Swiss economic and technical courses which are subject to federal control. The second simplified Peer Review examined 94 courses that had been asked to fulfil certain conditions or were in danger of not being recognised.</p>		

Table 5.3 (Continued)
2000–2003 evaluation

Formal review: This procedure consists of an external evaluation by the FCUAS and the CTI, which focuses on the evaluation of strategic and management processes and on applied research, services and further education. In concrete terms the evaluation should assess the transition from a higher vocational college to a UAS. The second formal review primarily assessed the implementation of the recommendations voiced in the first review.

Meta-evaluation: This is a form of external evaluation by the FCUAS and the CTI which focuses exclusively on quality management by the UAS. It assesses the adequacy of the quality management concept, whether evaluation is conducted carefully and whether recognised quality gaps are filled. However, there is no real, material quality control. This meta-evaluation was conducted in order to encourage UAS to immediately introduce quality management, since universities and other traditional academic institutions find it difficult to do so.

The results of this process have been compiled in two FCUAS reports (UAS 2002. FCUAS report on the creation of the Swiss UAS of 17 June 2002 and FCUAS report on assessing applications for renewed recognition of 29 October 2003).

We will present only the most important results here, providing a general impression of successful efforts to build the UAS system and its courses.

5.2.2 Procedures until 2002

Peer Review: As a world premiere, all Swiss UAS courses were twice submitted to a long and time-consuming Peer Review. Owing to widely prevalent scepticism towards evaluation procedures, the undertaking initially met with strong resistance among school management and teaching staff. Nevertheless, most self-evaluations showed a good level of quality and objectivity. Criticism later abated, as management and lecturers recognised that self-evaluation imposes a form of critical self-analysis, and that the subsequent assessment by peers contributes to innovative ideas and perspectives. In many UAS the evaluations also launched a positive dialogue between specialists. The international composition of the peer panel allows for cross-country comparisons; although most foreign peers confirmed that the new Swiss UAS are comparable to the older and more experienced foreign UAS, in private conversations they repeatedly insisted that the levels of the individual courses vary widely. The Peer Review was monitored by foreign accreditation agency experts; their evaluation, which focused more on the procedure itself, was positive.

The Swiss Peer Review did not allow for an overall evaluation of teaching, applied research, services and further education in all the UAS in Switzerland, since results were highly variable. Table 5.4 gives an overview of the number of courses which, according to the Swiss Peer Review, can be accredited unconditionally, those which will have to meet specific conditions and those threatened by non-accreditation.

Table 5.4
Overview of quality of all courses

Number of courses evaluated by the Swiss Peer Review	Accreditation recommended	Accreditation recommended only after fulfilment of certain conditions	Accreditation highly doubtful
220 courses (100 %)	126 courses (57.3 %)	67 courses (30.5 %)	27 courses (12.2 %)
Source: UAS 2002. Report on the creation of Swiss UAS of 17 June 2002.			

A compilation of all results of the Swiss Peer Review produced the following conclusions:

1. Although it varied somewhat for certain schools and courses, the level of teaching was generally ranging from good to very good. However, it would be advisable to develop more innovative courses that account for technological progress and adopt a more interdisciplinary approach.
2. The extended mandate pursuant to the FHSG was still problematic for certain schools; on the one hand certain fields found it difficult to differentiate between applied research and services (e.g. economics); in others the definition of applied research was still not clear (e.g. design).
3. Individual UAS had well-developed applied research projects, sometimes at university level, and cooperated effectively with academic research centres. Other schools paid no attention to their extended mandate, perhaps due to a lack of resources. However, the decisive element in the schools that were successful was the attitude of the school management and teaching staff, who had applied for research funding from the CTI after the elaboration of a clear research strategy, or had developed joint projects with the private sector.
4. A further critical aspect was the lack of thought given to the role and working conditions of lecturers in UAS planning. The extended mandate laid down by the law cannot be implemented by simply carrying

on as in the higher vocational colleges (engineering or business administration), without at least minimal non-professorial teaching staff. Here decision-makers still face considerable strategic development challenges. A further point concerns ongoing education programs for lecturers, which have already been launched.

5. The Swiss Peer Review showed that many UAS are no longer attentive enough to part-time curricula for working students, although this option is important in a system that aims to provide all graduates of the dual system with satisfactory educational opportunities.
6. The Peer Report repeatedly mentions the inadequacy of the professional baccalaureate, particularly in the technical domains (see Sections 4.5.2 and 4.5.3 in Chapter 4), an objection that was taken into account by the professional baccalaureate reform. On the other hand, the UAS should not only voice demands; they should also be aware of the limitations of the vocational secondary schools and accept graduates at the level one may realistically expect from them.
7. Great efforts were made to establish more extensive international contacts with foreign institutions and courses. In certain cases the focus was more on quantity than on quality contacts with prestigious foreign schools, with not very useful results.

The 2002 UAS Report contains detailed data concerning specific disciplines and schools; these will not be presented here.

Formal review: The formal review was based on criteria that were evaluated in quantitative terms by the FCUAS. Table 5.5 presents an overall assessment of all UAS.

Table 5.5
Overall assessment of all UAS

Strategy/management	2.34
Organisational principles	2.38
Marketing and communication politics	2.46
Quality management	2.55
Financial/salary management	2.57
Personnel policy	2.74
Spatial/infrastructure politics	2.79
Cooperation	2.81
Applies R&D policies	2.83
Framework conditions/legal framework	2.96
Degree to which mandate is fulfilled	3.07
Admissions policy	3.21
Average ratings (4 = good level of development; 1 = low level of development)	
Source: UAS 2002. Report on the creation of Swiss UAS of 17 June 2002.	

We will quote only the following findings from among the many included in the formal review; they are the most significant for the development of Swiss UAS:

1. Initially, the strategic process was rather difficult owing to the fact that the various UAS regions showed little readiness to optimise courses, mainly because of regional policy concerns. The importance of component schools for regional economic development was stressed time and again, in spite of the fact that concentration is indispensable for at least two economic reasons: schools that are too small will find it difficult to fulfil the new extended mandate, while small numbers of students raise the cost of education. This was confirmed by the first national domestic cost computation for UAS (OPET 2002). In the coming years decision-makers will have to resolve the contradiction between optimising the size of individual component schools and complying with regional interests; this contradiction can only be resolved successfully if strategic management is implemented even more strictly.
2. The recruitment of new staff and the creation of more non-professorial teaching positions were difficult due to financial bottlenecks. The extended mandate cannot be fulfilled if individual UAS do not have adequate non-professorial teaching staff and if there is no systematic poli-

cy to recruit young lecturers who are able to link theory and practice (UAS should not become pools of university-trained lecturers with no practical experience who have failed to get a university position). Also, the working conditions for lecturers have to allow them to fulfil the extended mandate; for example, the teaching load of 15–20 hours that is customary in higher vocational colleges will have to be reduced.

3. In the first formal review, the fulfilment of the extended mandate was rated as good, with just three restrictions. First, not all UAS have succeeded in making contact with interested companies with a view to applied research and the provision of services. Second, owing to a lack of clear specialisation, many schools have not clearly defined the extended mandate and thus have not successfully established a unique position in specific core areas. This problem is illustrated by UAS publications, which are often rather haphazard. Third, knowledge valorisation – via publications, provision of services, patents, licensing agreements or spin-offs – continues to be inadequate. But one should not overdo these criticisms – it was impossible to realise all the goals in the short span of four to five years. One should also keep in mind the disparities between individual UAS and individual courses.

Quality management: In 2002 all UAS introduced a quality management system, in most cases limited to teaching. The relevant instruments were usually adequate. However, the FCUAS called for an extension of QM to all areas covered by the UAS mandate and its harmonisation within each UAS. It also warned against possible dysfunctions of the system: complicated quality management procedures which keep lecturers from dealing with their main obligations; measures that are not objective-oriented enough and contribute nothing to the development of the schools, systems that fulfil a purely ritual role, evaluating the same criteria over and over again and generating no improvements. Generally speaking, the mere existence of quality management is no guarantee for a better UAS.

5.2.3 The procedures in 2003

In 2003 the FCUAS and the OPET processed the definitive applications for recognition of individual UAS and for the certification of their courses before submitting them to the Federal Council. For this purpose they ran a second simplified Peer Review and the second formal review.

Peer Review: First, a second simplified Peer Review with partly the same experts as in 2002 was conducted for all courses that had not been

recommended for approval in 2003; the aim was to check whether the recommendations had been followed, and the overall development of the courses. The results were good; out of 73 courses (the figure does not correspond to those shown in Table 5.4 because certain courses at component schools within one UAS were amalgamated), 69 were recognised while only nine were definitively refused. The following general trends became apparent in this simplified second Peer Review:

1. All courses whose recognition had been recommended made great efforts to improve their quality; particularly the development of curricula was often above average.
2. However, this review made clear just how difficult it is to distinguish between applied research and service provision in the context of the extended mandate. There were courses which focused on services and meshed their applied research with them; this was deemed acceptable whenever the services provided were innovative and not just routine. Other courses were only involved in applied research, since their specialisation made it difficult to propose useful services and/or the market was not interested in their services. But one finding from the first Peer Review was confirmed: the differences in quality between individual courses relative to applied research and services were considerable. Several UAS boasted quite the same level as academic institutions, and entered upon cooperative partnerships with them (especially in technical areas with the Federal Institutes of Technology). Other courses will have to make great efforts to reach a comparable level. This confirmed one of the criticisms voiced against the Peer Review: they are very good at assessments aiming to improve the quality of courses, but seem to lose their objectivity when they have to refuse accreditation. This is clearly demonstrated by the difference in assessments by the scientific management of the Peer Review, which would have refused 12 of 73 courses.
3. The applied research and services in design and the applied arts question what mean, has not been answered yet. The same question will certainly crop up in the health sector, which will be integrated in the UAS system in the coming years.

Formal review: It gave rise to the following findings:

1. At the end of 2003 all UAS had defined an explicit strategy, but there were significant disparities in their quality and implementation.

2. There are still important differences as to management and organisation. In four UAS management remains too weak to allow for effective specialisation and profiling.
3. Quality management showed great progress, but there is need of a stronger focus on applied research and services.
4. In certain UAS, mixed curricula are a cause for concern. They will only be acceptable as long as the demand for study places is strong enough. If classes do not achieve a certain size and have no specific profile, further mergers will be necessary. For funding and profiling reasons, the thresholds that have been defined by the FCUAS and the UAS Council (FHR) ought to be implemented rapidly.

Technical and IT:	75 students per course of study
Architecture, building, planning:	75 students
Chemical and life sciences:	75 students
Commercial and service sector:	90 students
Design and applied arts:	45 students

The development of the seven Swiss UAS, which were recognised by the Federal Council in 2003, has been extensive, and counters the claim that the transformation of the former colleges for engineering and business administration was purely formal and amounted to nothing but a change of name. The following elements should be kept in mind:

- The process transforming 53 largely independent engineering and business administration colleges and art schools under careful guidance by the FCUAS and the OPET into a UAS system with seven new schools has been successful.
- Article 3 of the FHSZG provides for an extended mandate (teaching, applied research, service provision and further education), which forced certain schools to carry out fundamental changes.
- A comprehensive procedure of evaluation was used to control the process of transformation. The effectiveness of the controlling process is documented by the Peer Reports of the Swiss Peer Review, the simplified second Peer Review, and reports of the formal reviews.
- The involvement of foreign experts in the Peer Review ensured that evaluations not only present a domestic view but meet international standards.

- The Peer Reports do not justify doubts on the equivalence of Swiss and foreign UAS, although individual courses (especially in the computer sciences) have sometimes met with criticism.
- Finally, one may say that reforms and advances in quality management in the transformation of a third level system have almost never been documented as extensively as in this case in Switzerland.

However, those in charge of UAS still have to make considerable strategic and organisational efforts in the interest of the ongoing development of these new institutions. In a study commissioned by “Avenir Suisse”, its foreign author, after interviewing UAS representatives, arrived at the following conclusion: they feel paralysed by the mechanisms that control the UAS. The complex interplay with the various federal and cantonal bodies acts as a hindrance to efficient UAS management. The UAS are on the lookout for recognition and a clear profile. They describe the integrated UAS system as a mere change of name, since in most cases the component schools are in fact completely autonomous (Sporn, in preparation).

This criticism has to be taken very seriously. Strategically and management-wise, much has to be done with respect to the following two areas:

1. The competencies of the FCUAS, the UAS Council (FHR), the UAS Conference (KFH) and the OPET are not defined clearly enough. As a result there is a lack of explicit strategic and binding provisions, leading to overlapping and delayed decision-making.
2. The will to innovate notwithstanding, it seems that the issue of UAS autonomy will again remain unresolved, although sensible implementation of New Public Management might generate effective solutions (see Dubs 2003).

However, the issues relative to the development of an educational system are not the only reasons for its success or failure. The subsequent integration of graduates and their professional success are much more important. This is why we will now examine changes in the job market that might affect UAS graduates.

5.3 The evolution of the job market for Swiss UAS graduates

Since 1977, written surveys of graduates of Swiss academic institutions have been conducted every two years; since 1993 they are also addressed to graduates of the higher vocational colleges and UAS graduates. In 2002 all former students who had taken part in the first survey were again questioned four years after their graduation (Swiss Federal Statistical Office 2003b).

Table 5.6 provides an overview of the **employment situation of university graduates** one and four years after the end of their studies.

These figures illustrate the following relations:

- The employment situation among UAS graduates is better than among those from traditional universities (except for female graduates four years after graduation).
- Between the first and the fourth year after graduation the number of job seekers fell more drastically among UAS graduates than among traditional academics. Among UAS women it also fell, but less significantly than among female academics. The proportion of women in technical, chemical or construction engineering is usually lower in the UAS than in traditional university level institutions. In spite of this, female graduates from UAS do not benefit the fact that there are proportionally fewer of them.
- Obviously, four years after graduation, female UAS graduates are more often involved in running a home and raising children than their peers from traditional universities; this indicates that they obey traditional role models more strictly. The same applies to maternity leave for women with children up to two years of age.

Generally one can say that the initial employment situation for UAS graduates is very good, especially for men, and improves with time; for women, it is good initially, but gets worse later. Most likely this is not a result of the job market, but of traditional attitudes of female UAS graduates.

A further point that is noteworthy is that there are **regional differences** for employment opportunities:

- Employment statistics show that the proportion of job seekers among university graduates in all five economic regions in Switzerland (as defined by the Swiss Federal Statistical Office) is lower than the overall unemployment rate. However, there are significant regional differences.

Table 5.6
**Employment situation among university graduates one
and four years after graduation (in %)**

University graduates						
	1 year after graduation 1999			4 years after graduation 2002		
All categories	Men	Women	Total	Men	Women	Total
Employed	88.3	86.1	87.4	93.3	90.9	92.2
Job seekers	3.8	5.9	4.7	2.5	2.1	2.3
Job offer	3.2	2.7	3.0	1.2	1.8	1.5
<i>Overall jobless</i>	<i>5.0</i>	<i>5.8</i>	<i>5.3</i>	<i>3.1</i>	<i>5.4</i>	<i>4.1</i>
Proportions among jobless						
Further education/ ongoing training	77.1	65.7	71.8	70.0	31.0	47.3
Family obligations	2.4	13.7	7.7	3.3	52.4	31.9
Other	20.5	20.6	20.5	26.7	16.6	20.8
Figures	(3030)	(2392)	(5422)	(1940)	(1553)	(3493)

UAS graduates						
	1 year after graduation 1999			4 years after graduation 2002		
All categories	Men	Women	Total	Men	Women	Total
Employed	92.4	91.9	92.6	95.5	90.1	94.0
Job seekers	3.7	4.1	3.8	1.4	3.1	1.8
Job offer	1.7	0.8	1.4	0.6	0.8	0.6
<i>Overall jobless</i>	<i>2.3</i>	<i>3.4</i>	<i>2.9</i>	<i>2.6</i>	<i>6.3</i>	<i>3.6</i>
Proportions among jobless						
Further education/ ongoing training	70.4	43.7	60.5	48.2	15.4	32.1
Family obligations	0	31.3	11.6	0	76.9	37.7
Other	29.6	25.0	27.9	51.8	7.7	30.2
Figures	(1891)	(738)	(2629)	(1052)	(413)	(1465)

Source: Swiss Federal Statistical Office: The job market situation of academics (2003).

- Trend-wise, the proportion of job seekers among UAS graduates is lower in 2002 in six out of seven regions than among university graduates, with the exception of Central Switzerland. However, the 5 % share of job-seeking women UAS graduates gives cause for concern.

When considering fields of study, differences among UAS graduates are also not very significant (unlike for university graduates, where they are considerably higher).

- Since the initial career phase in 1999, the proportion of job-seeking UAS graduates of machine and electrical engineering fell by 1.2 % by 2002; among UAS structural engineers it even reached 0%, in spite of the fact that job offers in these sectors fell by 2.5 % and 1.5 % respectively.
- There were almost no differences in the proportion of job seekers between the initial phase and four years on in design and applied arts.
- In 2002, the average rate of job seekers in UAS was 1.8 % (universities 2.3 %). As for fields of study, Table 5.7 shows the following differences in average rates for 2002.

Table 5.7

Proportion of job-seekers according to fields of study in comparison to average 2002 rate

Occupation	Proportion of job seekers compared to average rate	Percent of persons surveyed
Social work	+ 0.3 %	21 %
Arts	- 1.8 %	1.5 %
Design	+ 0.5 %	3.1 %
Business	- 0.2 %	22.1 %
Agriculture	+ 0.1 %	3.6 %
Chemical industry	+ 0.5 %	3.4 %
Technical	+ 0.3 %	29.8 %
Building industry	- 1.8 %	13.7 %

Source: Swiss Federal statistical Office. The job market situation of academics 2003.

These data show that unemployment risk for UAS graduates is small even in specific occupational areas. It is also noteworthy that the unemployment rate differs for subjects taught both in traditional academic institutions and in UAS. For the building industry, the commercial sector, agriculture and forestry it is higher for universities, whereas it is higher for UAS in mechanical and electrical engineering. This could justify a stronger concentration of courses in the UAS and might indicate that there is a greater need for reform in these areas – an opinion voiced repeatedly in the Peer Reports.

The **career opportunities** of academics are also regularly examined. The following findings are of interest (Swiss Federal Statistical Office, 2003b).

- Four years after graduation, the vast majority of employed academics are still in typical beginners' positions with no executive functions. However, UAS graduates are more frequently (35 %) in a higher management or leading position than university graduates (21 %); this may in large part be due to the fact that they start working later and have more professional experience to rely on.
- UAS graduates not only often launch their careers at a higher level than straight academics; they are also able to make more positive career moves during the first four years of employment (23 % against 20 %). But the proportion of downward career moves is also somewhat greater (9 % against 7 %).
- Career advancement opportunities for men and women are still unequal. For UAS graduates they amount to 25 % of men and 19 % of women (24 % to 15 % for academics).
- Advancement opportunities differ in the various occupational fields. Economists have the best (university 32 %, UAS 32 %). For UAS they are also very good in technical sectors (building 24 %, engineering 21 %); however, these again are areas that are dominated by men.

These data on advancement opportunities may lead us to conclude that UAS graduates are just as apt to fill leading positions as university graduates; this would seem to confirm the equivalence of these two educational pathways, at least over the first years of employment.

Occasionally, job market value is also measured by **analysing job offers**. A two-month analysis (which however is not very recent: Sidler 2004, 20) gave rise to the following conclusions: job offers for engineers targeted

- to 54 % only graduates of higher engineering colleges (HTL),
- to 30 % HTL or ETH (Federal Institutes of Technology) graduates
- to 7 % only ETH graduates.

Thus, HTL students can apply for 93 % of the engineering vacancies, which indicates a good job market situation for beginners.

In summary, we can draw the following conclusions. There are no indications that job market opportunities are generally worse for UAS graduates than for those from traditional universities. In other words, in the short time since their creation, UAS have confirmed their utility for the private and public sectors. There are several areas in which UAS students even seem to do somewhat better than their university counterparts. Only the future will show whether this is not a result of the ongoing good reputation of the former higher colleges for engineering and business administration. The UAS should therefore make strategic efforts to maintain their own profile and not succumb to the trend one observes in foreign UAS to become more “academic”.

There are many critics who claim that the development of academic and UAS studies produces an over-qualified workforce, which costs too much to educate and fails to bring the expected ROI. Thus, the problem of adequate education must also be examined.

5.4 The issue of adequate education by third level institutions

An interesting study by the Swiss Federal Statistical Office (2003c) examined the question of adequate education. According to Timmermann (1988) there are three approaches to this problem:

- a) Education is adequate when the educational level of the new job holder corresponds to the predecessor's level. This definition is problematic since it says nothing of changing job requirements. The predecessor may have continued to train, so that requirements are higher than indicated by the degree.
- b) The qualifications required for the job should correspond to the qualifications proposed by candidates for the job. In this definition the critical point is the term "qualifications". It is many-faceted and open to subjective interpretation, making it difficult to establish the level of adequacy.
- c) If one holds on to the idea of qualifications, one should establish which aspects of qualification should concord, and whether they should be viewed in the shorter or the longer term. Also, it appears that beginners in a job tend to be over-qualified, which again makes it difficult to define adequacy.

For the study discussed here, the Swiss Federal Statistical Office solved the problem by circumscribing the various aspects of educational adequacy by questions addressing both subjective assessments and objective criteria. For example, the study examined whether the employer insisted upon an academic degree for a certain position, in order to see whether changing qualification structures may generate vertical substitution processes. In other cases, interviewees were asked for a subjective assessment of the adequacy of their job with aspect to their education and skills. Four hypotheses were verified by this procedure:

1. The higher the overall workforce supply is, the stronger the trend to employ persons with higher formal qualifications than the predecessor's when filling a job vacancy.
2. The share of positions calling for high qualifications rises while the overall number of job offers remains stable: such a displacement of lower by higher qualifications indicates that the qualification structure has changed or is changing.

3. A rising number of graduates among the cohort of employees of the same age with a corresponding fall in the unemployment rate indicates that the number of jobs for the higher qualified has increased.
4. Persons whose studies focused on a specific, precisely defined occupation are less affected by “transitory unemployment” and more often adequately employed than persons whose studies targeted a more diffuse occupational goal.

By and large, empirical findings confirm these hypotheses. The current state of the economy is also important. The following conclusions are significant for UAS:

- When there is an economic downturn, transitory unemployment among university graduates rises in different degrees depending on region and occupational sector. Owing to the fields of study taught at UAS, their graduates are more strongly affected by economic fluctuations than traditional university graduates.
- When they are in over-supply, UAS graduates are distinctly more likely to take a job for which they are over-qualified than university graduates; this difference is even more marked in the French than in the German speaking parts of Switzerland.
- There is a higher risk of over-qualification in the service sector, and concerns above all students of economics in both traditional universities and UAS.
- Students from specialist fields in which studies are highly structured and very professional, are less threatened by transitory unemployment and more likely to find adequate jobs than those whose studies correspond to no definite occupational profile.

These initial findings do not allow for definitive statements concerning adequate employment of university graduates. Also, there are still no reliable data on the differences between UAS and university students. The issue will continue to be important, and relevant answers may provide ideas for the design of courses. For a short time after graduation, occupation-related courses prove more adequate. Whether this is also true in the longer term, or whether those with a more general education achieve higher adequacy in the longer term remains to be seen. Thus the argument of adequacy cannot be used to discuss the strengths or weaknesses of Swiss UAS. But we may assume that a stronger occupational focus is a better guarantee of adequacy also in the long term; it has been observed for quite some time that well trained specialists have better pre-conditions for their subsequent career than persons with a uniquely general education.

5.5 Swiss UAS and the Bologna Process

5.5.1 Bases

Much has been and still is being written on the Bologna Process. Our aim is not to describe the entire process and/or discuss the fundamental problems raised by the Bologna Declaration of 19 June 1999 (Joint Declaration of the European Ministers of Education, convened in Bologna on the 19 June 1999). Switzerland signed the declaration together with 28 other states; by doing so it committed itself to its implementation. We will discuss only the aspects that have a bearing on Swiss UAS for the foreseeable future.

With a view to facilitating mobility and promoting European competitiveness, the Bologna Declaration aims to introduce **comparable academic structures** throughout Europe. Here are the major points specified with this aim in mind:

- “Adoption of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens’ employability and the international competitiveness of the European higher education system.
- Adoption of a system essentially based on two main cycles: undergraduate and graduate. Access to the second cycle shall require successful completion of first cycle studies, lasting a minimum of three years. The degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification. The second cycle should lead to the Masters and/or doctorate degree as in many European countries.
- Establishment of a system of credits – as in the ECTS system – as a proper means of establishing widespread student mobility. Credits could also be acquired in non-higher education contexts, including life-long learning, provided they are recognised by the receiving universities concerned.
- Promotion of mobility by overcoming obstacles to the effective exercise of free movement, with particular attention to:
 - for students, access to study and training opportunities, and the related services;
 - for teachers, researchers and the administrative staff, recognition and valorisation of periods spent in a European context, researching, teaching and training, without prejudicing their statutory rights.

- Promotion of European cooperation in quality assurance with a view to developing comparable criteria and methodologies.
- Promotion of the necessary European dimensions in higher education, particularly with regard to curricular development, inter-institutional cooperation, mobility schemes and integrated programmes of study, training and research.”

The degree to which this declaration is legally binding is of paramount importance since it will determine the degree of each country’s freedom in shaping its own higher educational system. An interpretation generates the following conclusion for Switzerland (see also Jaag & Kummer [2002] and the literature quoted there):

- The Bologna Declaration is not a legally binding state agreement, but “only” a statement of political intent. The implementation of its postulates is up to the individual countries.
- The harmonisation of the widely divergent courses in the individual countries has until now been guided mainly by formal criteria, as suggested by graded courses (cycles) and equivalent degrees. There is as yet no reference to the problems arising from national differences between education leading up to higher studies (although Germany criticises the Swiss solution involving vocational secondary schools and the professional baccalaureate – usually on the purely formal basis of the number of lessons – and there is a risk that Swiss students may be refused admission in Germany for this reason). Section 4.5.5 of Chapter 4 explained why this criticism is unjustified. Nor does the Bologna Declaration discuss concrete curricular contents (and rightly so). Only the *Dublin Descriptors* (Joint Quality Initiative 2003) specify general requirements of Bachelor and Masters degrees.
- However, one may assume that a lack of legal bases notwithstanding, the Bachelor/Masters system will increasingly be viewed as the “world standard” and that a two-cycle system will become the legal benchmark for the international recognition of higher education degrees. “We may assume that individual countries and institutions will not be able to refuse this development for both economic and educational policy reasons; thus we may also assume that Switzerland and Swiss higher education institutions will be forced to adapt study courses to the rather formal Bologna Declaration criteria.” (Jaag & Kummer 2002, 17).

In view of this situation, two aspects are significant for the further development of the Swiss UAS system:

1. To ensure international recognition of Swiss UAS, the formal requirements of the Bologna Declaration and all resulting decisions will have to be complied with.
2. However, since the situation allows for some flexibility, Swiss particularities should be taken into account and not sacrificed in hurried compliance with purely formal criteria. The profiling of Swiss UAS via the targeted fulfilment of the extended mandate should always be kept in mind, alongside the need to obey formal requirements. The strategic positioning of the UAS should respond to their own demanding requirements.

In view of these Swiss particularities, the legislative will is essential to the constitution of the UAS. The Message repeatedly stresses that the UAS are **equal but different** from traditional academic institutions, although this intention has not been embodied in legislation, but only formulated as an educational policy intention. As a result, the UAS have no legal claim to being treated in (absolutely) equal fashion with academic institutions (Jaag & Kummer 2002). But since the legislator wants to valorise vocational education via the UAS and obtain international recognition of the agreements, it will be essential to see whether the UAS have the possibility to achieve equal status. This will be significant in the coming years, since the financial situation of both the Confederation and the cantons might generate measures which could jeopardise the implementation of these postulates. We should keep the following aspects in mind:

1. Rapid introduction of the Masters degree in UAS: the draft revision of the FHSG (Article 4 paragraph 1) provides for the introduction of Masters programmes (as in Germany, see § 19 of the Hochschulrahmengesetz der Bundesrepublik Deutschland of 26 January 1976); the Prague Conference decided that the introduction of Masters studies in UAS will be possible [Ministerial conference in May 2001 in Prague; see Prague Communiqué]. However, a rapid decision concerning how, where and how many Masters UAS degrees should be approved is required (see Section 5.5.4 Chapter 5).
2. Length of Bachelor degree courses: The Bologna Declaration specifies a length of **at least** three years for a Bachelor degree. The representa-

tives of technical studies have been demanding a prolongation to 3¹/₂ years, and to 4 years for architects (see the Report of the OPET expert panel of 12 February 2001 on the international recognition of UAS diplomas in architecture). Although three-year Bachelor programmes would be preferable for both financial reasons and for limiting study duration, in view of the UAS profile this issue should be given more thought, especially as in Germany four-year studies are increasingly frequent (see 5.5.3 Chapter 5).

3. The formal and content-related academic value of the Bachelor degree. Critics have voiced the fear (Strahm 2003) that the Bachelor degree may be less valued than diplomas from the former engineering and business administration colleges. They justly say that the Bologna model was launched by countries without the apprenticeship option, in which practical vocational training is not valued. The granting of a Bachelor degree at the end of the first three-year cycle in a university or a UAS would therefore disadvantage UAS students, since their practical vocational training acquired alongside their higher academic education would not be valorised at all. An apprenticeship would become “no more than an inconvenient solution without value, one that only burdens and prolongs overall education” (Strahm 2003, 13). In other words – and this seems to be part of the problem – there would be two types of Bachelor degrees: the university-based one, without practical vocational experience, and the UAS degree, with comprehensive previous vocational training. This problem will be dealt with in Section 5.5.5 of the present chapter.

5.5.2 The current status (February 2004)

Although Swiss educational policy recently underwent a change in paradigm, fundamental decisions concerning the implementation of the Bologna Declaration were made rapidly, and documents providing an adequate framework for practical implementation by individual UAS are already available.

The basis for implementation is given by the **Guidelines for the implementation of the Bologna Declaration in the UAS and teacher training colleges voiced by the Swiss conference of cantonal educational directors EDK of 5 December 2002**. This document prescribes the two-cycle courses (Bachelor and Masters), introduces credits, sets the conditions for admission to the Masters cycle, and calls for a uniform, internationally recognised nomenclature of degrees.

On 30 September 2003 the Swiss UAS Conference (KFH) published the paper “**The concept of two-cycle studies: Best Practice and Recommendations**”. It provides practical general instructions for the introduction of the two-cycle system in the UAS, although other solutions than the ones specified by the Best Practice Regulations may be chosen when objective reasons justify this (specific conditions, quality of course of study).

The **Guidelines for the coordinated revision of teaching at Swiss university level institutions as part of the Bologna process (Bologna guidelines) of 4 December 2003** formulated by the Swiss University Conference (CUS) is a further important document.

They provide a binding framework for third level institutions and are relevant for the UAS in connection with the definition of Bachelor studies.

Finally, there is the revision of the FHSG which is currently being dealt with by Parliament (Message on amendments to the FHSG of 5 December 2003, BBl 2004 I 145).

5.5.3 The length of Bachelor studies

The Bologna Declaration specifies that Bachelor programmes (first cycle) **should last at least 3 years**. There is almost general agreement that the Bachelor degree should correspond to a full vocational diploma. This decision is justified by the worldwide observation that it is favoured by the trend towards an occupationally targeted degree. It is estimated that 70–80 % of students terminate their studies at this level. Initial surveys from the University of St. Gallen have shown that approximately half the students do not go on to a Masters programme after the first cycle. However, it remains to be seen whether this figure is reliable – for the time being we cannot tell how many students interrupt their studies and how many take them up again after having gained some practical on-the-job experience. Experts were rather surprised by these results – they had expected a lower figure since they did not believe that a Bachelor degree is perceived as a final diploma.

The Graz Convention of the European University Association (29–31 May 2003) recommended use of the *Dublin Descriptors*, which for purposes of “orientation” specify what is meant by professional competence. They confirm that vocational qualifications are the aim of the Bachelor degree, but in a wider sense than was originally intended. The UAS Conference (KFH) also confirmed (2003, 12) the autonomous value of the

Bachelor degree and called attention to the disadvantages of giving up this degree's independent occupation-oriented status (the transition to the job market could not be guaranteed due to the lack of professional qualifications, mobility would be reduced and, at the practical level students could not interrupt their studies between the Bachelor and the Masters cycle).

In Germany there is more discussion than in Switzerland on whether professional qualifications can be achieved during the three-year cycle, especially when students are to be introduced to an autonomous, practical specialisation with a scientific, application-oriented focus. Especially in the context of chemistry and life sciences, it is argued that a holder of a Bachelor degree should be able to plan, execute and document projects independently (as a specialist or project leader) immediately after graduation, and should have had practical experience of at least one large-scale project to prove his competence. These requirements can only be met after a lengthy thesis. Similar arguments are heard for other technical studies.

A sensible solution might be to prolong the first cycle to 3¹/₂ years, with the last half year dedicated entirely to an application-oriented thesis. Such independent work on a thesis promises several advantages. First, professional skills would be fostered in a real-life situation, promoting the students' autonomy and self-reliance and demonstrating how effectively they deal with practical problems. Second, the thesis would foster relations between lecturers, students, the industry and commerce. Third, all lecturers overseeing a thesis would have to tackle problems of applied research and provision of services, thus to a certain extent making up for the lack of non-professorial teaching staff. Moreover, some students might be motivated to seek a staff position (assistant or other). Fourth, the UAS Bachelor degree would be more strictly differentiated from that offered by traditional universities; indeed it is becoming increasingly clear that at universities the Bachelor cycle is no longer as professionally oriented as is called for by the Bologna Guidelines of the Swiss University Conference (SUK) and by university rectors. "The Bachelor degree is the pre-condition for Masters studies; as a well-defined and recognised starting point it facilitates a switch of institution or subject matter (mobility). Those who have opted for Bachelor studies have also decided to enter the labour market for a certain time or definitively." (page 7). It remains to be seen whether with this low-profile definition universities will in the long term prepare students for direct entry into professional life. Here the UAS could offer their graduates better opportunities to enter professional life with the 3¹/₂ year solution (see comments on job market situation in Section 5.3 in Chapter 5).

Temporal adjustment could be achieved by shortening the Masters cycle to 1¹/₂ years; however, this would require a re-allocation of ECTS credits between the Bachelor cycle (180 ECTS credits) and the Masters cycle (90/120 ECTS-Credits).

One important thing will have to be kept in mind. No matter how many studies are conducted, it will never be possible to prove scientifically how many lessons offer the optimal solution for a given learning project. Probably the intensity of learning and working is more important than the number of lessons (see Smith 1987). This of course means that one should not set a fixed number of lessons and length of study for all subjects. It is more important to establish the above individually, having first considered the objectives and necessary teaching forms and requirements.

This leads to an important **demand**: in justified cases and for certain vocational disciplines, the possibility to introduce the 3¹/₂ year option for the Bachelor degree should be introduced. As mentioned above, the last half year would be dedicated to work on the thesis.

We are not arguing in favour of a general prolongation of studies: longer learning periods to achieve thesis level are necessary only in certain technical occupations (e.g. to account for hours in the laboratory). But it has been shown that nine weeks are enough to write a thesis in economics.

5.5.4 Definition of a Masters cycle

The introduction of the Masters degree is now viewed more critically than previously (Article 4 of the Federal Council FHSG proposal of 5 December 2003). The introduction of this cycle should not be delayed for financial reasons. Internationally the two-cycle system has been accepted, so that Swiss UAS without Masters programmes would be rather unlikely to obtain international recognition and would lose a considerable part of their prestige. They would also not produce enough graduates capable of working independently on applied practical solutions, especially in small and medium-sized companies. Finally, the challenge arising from Masters studies would make it easier for UAS to find qualified teaching staff.

Many problems are bound to crop up in terms of the definition of the number of Masters courses and the selection of UAS which will be authorised to offer them. Too great an offer should by all means be avoided, not

only for financial reasons. It will also be impossible to find a sufficient number of qualified UAS lecturers in such a short period of time, i.e. persons able to fulfil their difficult task in practice-orientated applied research and teaching. Moreover, Masters programmes require a sufficiently strong non-professorial teaching staff to ensure adequate attention to students and cooperate in applied research and provision of services. Such staff will be expensive, limiting the possibilities to develop it.

The Message on the modification of the FHSg of 5 December 2003 presents the point of view of the Federal Council on Masters programmes. "Masters programmes should be introduced only in UAS which are highly competent in teaching as well as in application-oriented research and development and have an adequate infrastructure." (BBl 2004 I 145). Such concentration is useful, since small UAS without a sufficient infrastructure cannot create the requisite culture of teaching and research. For Masters studies to be successful in the longer run, the FCUAS in agreement with the Federal UAS Conference (KFH) should develop a selection and accreditation procedure to judge applications as objectively as possible and recommend them.

Following experiences with the Peer Review, the procedure presented in Figure 5.8 is proposed here:

Table 5.8

Procedure for the accreditation of Masters programmes

Management of the procedure with application: FCUAS/OPET in agreement with the KFH.	
1 st step:	The FCUAS launches an open call to all UAS for the introduction of Masters programmes. It sets conditions for application on the basis of the legislators' intentions, the proposals in the <i>Dublin Descriptors</i> , and successful factors from foreign UAS.
2 nd step:	Applications are evaluated by expert groups from the various specialist fields by means of on-site visit and submitted to the FCUAS/OPET to the attention of the Federal Department of Economic Affairs. Mindful of the experiences with the Peer Review, a majority of the experts must be foreign in order to avoid political and personal bias in decision-making. Since the expert groups are constituted by specialist field, three to four members of the FCUAS from different back-

Table 5.8 (Continued)

Procedure for the accreditation of Masters programmes

3 rd step:	<p>grounds should be involved for purposes of comparison; they must see to it that the same standards apply throughout (this procedure was useful in the second simplified Peer Review). The FCUAS prepares the application to the Federal Department of Economic Affairs after previous transparent discussions with the parties involved. To facilitate decision-making, it defines initial quality-oriented political criteria such as linguistic regions, number of students (number of Bachelor students, economic needs, etc.).</p>
Later:	<p>Such a procedure should generate more sensible solutions than the introduction of a previously set number of Masters programmes. Regular new accreditation of existing Masters programmes and the possibility to file new applications every 5–7 years. (US experience has shown that there can be significant shifts in quality over 5–7 years.)</p>

5.5.5 Admission to the Masters cycle

Apart from the question of which schools should propose Masters studies, there will also be conflicting opinions on who is to be admitted to them. The draft of the new FHSG law of 5 December 2003 specifies in Article 5, paragraph 4, that admission to the UAS Masters cycle requires a Bachelor or equivalent degree. The UAS may introduce additional requirements. This power granted to the UAS is very important for the future development of Masters programmes. The leading US universities show that a general admission with a single qualifying degree (Bachelor) does not give rise to optimal study results. With additional strictly tailored requirements quality can be greatly improved. But these should not boil down to purely formal criteria or to traditional supplementary entrance examinations. Special admission procedures will have to be developed, accounting for learning capacity and personal traits that are particularly important for a given subject. This would increase competitiveness between Masters programmes and ensure that only the best students with a Bachelor degree and other qualifications are admitted.

5.5.6 Study duration and comparability of university and UAS Bachelor and Masters degrees

The Bologna Declaration requires at least 180 ECTS credits for a Bachelor degree. Switzerland requires exactly 180. One often hears the demand that the number of credits for UAS should be increased. On average, obtaining a Bachelor degree at a UAS requires one year more than at a traditional university; moreover UAS graduates have additional basic vocational training. This may be true from a purely mathematical point of view; in the longer term the issue should not have great significance.

- One of the aims of the Bologna Declaration is to design uniform studies and degrees. A distinction between the UAS and the university Bachelor would counteract such uniformity.
- The comparison between study duration and ECTS credits is confusing (Sidler 2004). Drawing straight conclusions on the quality of an education from the number of lessons and credits is a questionable procedure, since quality is significantly influenced by a number of other factors. (see Section 5.4.7 in Chapter 5).
- All over the world, degrees and other diplomas are gaining in importance, mainly for reasons of prestige. The numbers are growing – in Europe alone there are now over 600 institutions offering the MBA. Consequently their value falls. The US trend to consider the school as more important than the degree will certainly also gain in strength in Europe – good schools will provide their graduates with good job opportunities regardless of degree and credits.

To a certain extent, these findings have reactivated Strahm's (2004) worry that "in many European countries the Bachelor degree will simply function as a transition for the many university students who prematurely break off their studies. This European 'transitional Bachelor degree', which does not qualify students for their future occupation, is now supposed to function as a benchmark for supposed equivalence, whereas it will really only devalue Swiss UAS graduates – supposedly to promote European mobility." His diagnosis could apply to Swiss universities if there were a rising number of Matura students just barely getting a Bachelor degree and then taking jobs for which their university degree has not fully prepared them. Owing to the relatively vague definition of the objectives of the university Bachelor degree (Bologna guidelines of the CUS 2003, 7) and university statements (the Bachelor degree is the pre-condition for a Masters degree) such a situation is indeed possible. For the UAS the danger is

smaller, since initial vocational training reinforces the direct occupational link, and the UAS explicitly aim for a strong bond between theory and practice. However, one may not ignore the risk mentioned previously that UAS will become overly scientific as a result of the international competition between “abstract researchers”, along the lines that can in part be observed in Germany. There the practice-oriented mandate of the UAS is being increasingly by-passed for reasons of prestige, and it is becoming difficult to distinguish between UAS and traditional universities. Whether the Swiss UAS Bachelor degree will develop into a mere “transitional Bachelor degree” or whether it will prove an effective vocational training tool depends only on the strategic profiling of the UAS and their educational concepts. The influence of the formal elements of the Bologna Declaration is likely to be slight.

Nonetheless, legislation might promote the “transitional Bachelor degree” solution, if it were to comply with the proposal of the Council of States, who want to admit Matura students to the Bachelor cycle without a previous one-year practical training (on-the-job experience); instead, this training can be done during the Bachelor cycle. The reason invoked – the lack of practical training positions as a preliminary condition for studies – may be justified in certain phases of the economic cycle. However, it works against the effective profiling of UAS studies, since teaching and learning can no longer be based on occupational experience. This will be a minor problem as long as the number of Matura students in the UAS remains small. The greater their numbers however, the more difficult the UAS will find it to build a clear profile, especially if there is a trend for university students who have failed their exams to transfer to UAS.

A problem that has not been solved and that is probably impossible to solve is the difference in the number of years required for a Bachelor degree from a university (6 years in secondary school/Gymnasium and 3 years in university) and from a UAS (3 years in secondary school, 3–4 years apprenticeship and 3 years in a UAS). The curtailment of apprenticeships from four to three years is unlikely to be approved by the trade associations and should not be enforced, particularly in occupations with a production-oriented training strategy. As shown in Section 4.5.6, the integration of a part of the vocational secondary schools in the UAS is not feasible, mainly because of international recognition. An alternative might be to speed up entry into the job market by sending children to school earlier and by shortening primary schooling by means of a differentiated basic level.

5.6 Accreditation of UAS and their courses

The last section insisted upon the importance of quality for the UAS. They are less reluctant than universities to face quality management and accreditation, since the Peer Review has shown how useful these can be. The Federal Council's draft proposal on the FHSG of 5 December 2003 provides for accreditation and quality management in Article 17: "The Federal Department of Economic Affairs accredits the UAS and publishes the necessary guidelines. Accreditation can be outsourced to third parties."

First, the guidelines will have to establish how accreditation will be organised. There are three possible solutions:

1. The FCUAS takes on this task, with the support of the OPET.
The accreditation process in 2000–2003 proved that this a feasible solution. However, it takes time for a political non-specialist body to cope with such a task; perhaps it would be preferable for the FCUAS to have only a leadership role.
2. The existing university accreditation body (Center of Accreditation and Quality Assurance of the Swiss Universities, OAQ) is entrusted with the task.
This solution would make all accreditation procedures for universities and the UAS more uniform. It would make use of the same standards and ensure the comparability of all accreditations. Moreover it would enable Switzerland to "speak in one voice" in the international debate. Finally, it would guarantee that accreditations would be conducted in a more professional manner. On the other hand, it would establish one big monopolistic institution with a likely tendency to red tape.
3. Various accreditation institutions exist side by side.
This option (which has already been introduced in Germany) provides for several accreditation agencies, established and managed by the Bundesländer, trade or professional organisations or other bodies; they in turn must be accredited and supervised by a central accreditation body. Schools may choose an agency themselves, or the relevant organisations do so.
This variant increases competition, ensuring a more effective accreditation process. It also allows for specialisation, if trade associations are entrusted with the task. However, for a small country like Switzerland there is a risk of over-organisation and resulting higher costs.

We opt for solution 1, partly as a result of the Peer Review experience. The UAS Service Centre within the OPET would establish a small “accreditation section” to take care of organisational matters (organisation of the Peer Review), while the FCUAS would manage the process (primarily the design of the Peer Review and preparing applications for the relevant department). The advantage of this option is that the FCUAS, which is responsible for the strategic development of UAS, would manage and monitor (control) the entire UAS system and its ongoing development.

5.7 Pedagogical aspects of the UAS

As mentioned earlier, the UAS Conference (KFH) document “The concept of two-cycle studies: Best Practice and Recommendations” (2003) provides an excellent introduction to the opportunities this solution offers the UAS. It does require some commentary.

In a first step, it explains the concept of modular courses. The definition of this concept (page 9) is good and useful. It is precisely for this reason that the criticisms voiced against it in Section 3.2.1 of Chapter 3 do not apply; the term “module” here does not mean set “blocks”. A variety of structural possibilities and teaching methods is maintained. On the other hand, for lecturers the establishment of such modules is both difficult and time-consuming, and this aspect should be accounted for when establishing their work load.

Significant attention should be paid to the proportion of school hours and self-study. Many lecturers at UAS fear that for financial reasons self-study will be given more importance, leading to loss of quality (not enough monitoring of self-study). This warning should not be taken lightly. Learning theory shows clearly that self-controlled learning requires intensive assistance and advice, especially in the beginning. Learning by trial and error is definitely not an efficient option (see Dubs 2004b). Students at traditional universities often assess self-study negatively, since they do not know how to deal with it. The concept should therefore be introduced in a targeted and controlled manner. When implemented only to save costs, it leads to diminished quality.

Finally, for the UAS to establish a clear profile they will have to devise a concept of practice-oriented and research-based teaching and learning (see UAS and university recommendations in Mittelstrass 1998). The aim is not to copy university practices but to strive for scientifically-based, R&D-oriented teaching and research. Only such a solution can justify the creation of UAS and a differentiated third level system.

In conclusion, one hazard should not be ignored. The Bologna Declaration aims to improve student mobility by providing formal regulations of how studies should be structured and upping the comparability of courses and the recognition of study results. This aim might become dangerous if it were to generate extensive and detailed regulation of all courses (e.g. module design and structure). Creative UAS development would above all be threatened if module contents were also to be prescribed – a solution proposed in some countries. This not only increases red tape, but

also leads to a separation of teaching and research (see comparable arguments in Bader & Jenewein 2004). It cannot be repeated often enough that structures and overly strict regulations are no guarantee of the quality of studies. The decisive elements are content and a wide range of teaching procedures. Should the entire Bologna process therefore not be guided by the *comply or explain* principle? (as in Corporate Governance). The Bologna regulations should be complied with, but may be bypassed if there are convincing reasons to do so (e.g. profiling a course of study).

5.8 Recognition of Swiss UAS diplomas abroad

International recognition of UAS diplomas shows that the integration of UAS into the international university and research community has been a success, and that the transformation of the former higher vocational colleges (HTL and HWV) into UAS has made significant progress. We must distinguish between two types of recognition:

1. Recognition of UAS degrees in view of a **job abroad**.
2. Recognition of degrees and studies in view of **continued studies in a foreign third level institution**.

The admission of Swiss UAS graduates to the **job markets** of the 25 EU member states is regulated by the bilateral agreements between Switzerland and the EU, which came into force on 1 June 2002. Basically, for professions or occupations that require certification (i.e. those for which one needs a diploma, degree, certificate or proof of proficiency) a Swiss UAS degree offers equivalent access to the job market as a third level degree of the country in question. A formal distinction is made in the EU between **sectoral guidelines** for harmonised professions, i.e. automatic recognition of basic training (for seven medical and paramedical professions and architects [although for the time being, Swiss architects are not included in this regulation, see Expert Panel on the International Recognition of UAS diplomas, 2003, which specifies planned measures for architectural studies]), and **general guidelines**, i.e. graduates with a diploma from a Swiss school are entitled to have their diploma evaluated; in principle they may assume that it will be recognised and they will have access to the job market. If the evaluation shows inadequacies in the diploma (insufficient learning time or content in comparison to the country's requirements), the gap may be filled by a course or a supplementary examination.

This distinction between sectoral and general guidelines is due to a change of paradigm within the EU. Originally the EU intended to alleviate problems between occupations by harmonising education and training. The aim was to adapt all training courses (sectoral guidelines). Since this proved a difficult undertaking, general guidelines were introduced, based on the assumption that vocational education in the EU member countries is by and large equivalent. The EU adopted the principle of trust in the degrees of other states, i.e. the country that recognises a degree

trusts it and as a rule approves its application for recognition (e.g. EU degrees in Switzerland 2004 and the first general guidelines 1989/48/EEC). An evaluation of this regulation, in which Swiss UAS decrees were tested in January 2004 by three culture ministries in Germany showed no discrimination.

The recognition of degrees and study results in view of **continued studies in a third level institution abroad** requires bilateral agreements with individual countries. The current situation is as follows:

Germany: The amended agreement on mutual recognition of equivalence for third level studies between Switzerland and Germany was signed on 16 April 2002; this enacted the inclusion of Swiss UAS within the existing agreement on academic equivalence.

Austria: The 1994 agreement is extended to UAS, so that Swiss UAS graduates are admitted to Austrian UAS.

Italy: A new equivalence agreement has been in force since 1 August 2001; it also includes UAS, although Swiss UAS have no counterpart in Italy (except for the health sector in the province of South Tyrol).

France: Negotiations are under way, results are pending.

United States: No response as yet to proposed negotiations.

In summary one can say that the promotion of mobility for UAS degrees is well on its way, in line with the aim of internationalising UAS.

Chapter 6:

Answers to the seven fundamental questions

The answers to the seven questions posed over the course of this appraisal can be answered briefly as follows:

1. What are the special features of Swiss basic vocational education?

Until the BBG entered into force on January 1, 2004 (adopted by Parliament on 13 December 2002), the Swiss vocational education system was a traditional dual system. That is to say:

- It was widely respected by the responsible people in politics and industry, although there particularly in the economical sector, were significant discrepancies particularly in the economical sector, owing to the fact that the latter supported the system in theory, this did not necessarily translate into reality (offer of apprenticeship positions, willingness to reform);
- Compared to other countries, the dual system is well organised and that its structure and design are less bureaucratic, making it responsive to the needs of industry;
- It is no longer able to keep up with changes in the economy (strongly aligned to the needs of SMEs, relatively rigid organisational design, conflict between the “demand approach” [alignment of the system to economic and company needs] and the “social demand approach” [personal development of students and provision of a general education]), with individual trade associations showing greatly varying degrees of willingness to innovate;
- Nevertheless, it has generally been successful (clear professional success [e.g. documented at the World Skills Competition], low youth unemployment, a high level of practical vocational training, and a high level of satisfaction among apprentices);
- It is increasingly faced with an unbalanced apprenticeship market in the short term with few generally effective regulatory measures;
- Its position has been somewhat threatened by calls for a rise in the number of students opting for Matura schools, for which there is no inherent necessity. In this case, it clearly boils down to issues of prestige.

There are no compelling reasons to change the system, since it is impossible to prove scientifically the superiority of one vocational education system over another. However, there is a **need for far-reaching reforms**.

The BBG of 13 December 2002 has created the best prerequisites to ensure that due consideration is given to the need for reform in the vocational education system:

- The BBG and its decree (BBV) are loosely worded, giving both trade associations and OPET the freedom to adapt requirements of individual vocational education to the relevant social and economic needs;
- The expert model provides two possible ways to make training requirements more flexible;
- The design of the legislation is such that it prevents vocational education from becoming overly bureaucratic.

However, there still is a significant **need for action**.

- The OPET should establish a minimal framework in the sense of clarifying the expert model to ensure that the entire system does not fragment beyond control due to the open wording of the law.
- The OPET should establish a framework for training requirements. In particular, they should look at whether moves should be made towards simplifying these requirements when setting educational standards (Klieme 2003) or whether they should stick to training schedules that are focused on learning objectives.
- Trade organisations must show a willingness to innovate, with particular attention given to the degree of specialisation/generalisation ratio (more occupational fields and areas of activity rather than narrowly defined occupations), to general education, to the promotion of the federal vocational certificate as well as to permeability of the system,
- The OPET must take on the role of innovator.

2. What are its general strengths and weaknesses?

Chapter 2 contains a comparison of the strengths and weaknesses of the system. A modern **three-track** vocational system provides the necessary conditions to ensure a supply of capable young people to the work force. The professional baccalaureate system together with easier access (based on entrance examinations) to third level education also improves permeability, i.e. education no longer has to end with the completion of three-track vocational training. In addition to the opportunity of receiving specialist advanced training, which will continue to be important, vocational education graduates can gain entry to Universities of Applied Sciences and to traditional universities (based on an entrance examination).

However, the new openly worded BBG also takes into account work on possible weaknesses:

- The integration of weaker and/or socially disadvantaged students in the job market, made possible by the introduction of the federal vocational certificate. However, industry must be prepared to create apprenticeship positions, which are an essential part of federal vocational certificate requirements. Regrettably, this continues to meet resistance. It is also safe to say that the problem of weak and disadvantaged students cannot be solved by a reformed vocational basic education system alone. The elementary school and lower secondary school levels must also consider introducing reforms.
- There is an urgent need to reduce the number of lower secondary school graduates who have to opt for an interim solution before transferring to the basic vocational education system. The resources invested in these solutions (e.g. an additional year at a lower secondary school) should be used to promote the direct transfer (in the form of subsidies, i.e. kick-start funding, for occupational training opportunities).
- The short-term disequilibrium in the apprenticeship market will continue. It is simply not possible for all young people to train in their dream occupation, because the job market dictates the terms. Within the design of occupational requirements, measures must be introduced to ensure that students are better and more flexibly prepared for life-long learning. The expert model provides suggestions that are worthy of particular consideration, as changes to occupations and occupational fields during the apprenticeship period are growing in importance.
- The setting up of a vocational education fund as envisaged in the BBG is an effective measure to redress the balance of the apprenticeship market, insofar as it is tailored to the given area. General policy measures are inappropriate here since the market for apprenticeships in individual occupations shows significant regional and sectoral variations.

3. How does the Swiss system of vocational education and Universities of Applied Sciences that is oriented towards the labour market affect the individuals, their employability and their preparedness for third level education?

Contrary to widely held assumptions, apprentices express a high degree of satisfaction with their vocational education, although they view their school education more negatively than their occupational training. Fur-

thermore, they do not feel that their workload is excessive. It is interesting to note that satisfaction among students at Matura schools is lower and that they feel their workload is excessive. For this reason, it is false to claim that the current vocational education system no longer corresponds to individual training requirements.

The employability of qualified graduates of basic vocational education is good. By international comparison, youth unemployment is relatively low in Switzerland.

The system will be faced with a fundamental dilemma in the future. The more specialised the vocational education curricula are getting (in line with the occupational composition of vacancies) and the more firms orient their training along production-driven criteria, the greater the employability of apprentices will be. However, greater specialisation does not create the ideal prerequisites for professional mobility. Effective compromises should be sought in the interests of employability and mobility with regard to the development of individual training requirements. The expert model provides an answer.

The level of preparation of graduates of vocational secondary school to embark on further education, seems fundamentally satisfactory, although there are shortcomings in individual subjects (e.g. in mathematics and in first languages). It is encouraging that analyses of German and Swiss entrance exams to Universities of Applied Sciences are relatively similar in spite of their different designs. Therefore, we can unequivocally state that the vocational secondary school with its professional baccalaureate should be maintained, although discussions with UAS on curricula should be improved.

The employability of UAS graduates is also good, and in some cases better than for traditional university graduates. However, employability differs widely according to region, area of study and gender, which are heavily influenced by regional/economic and cyclical factors. Insufficient education and training can hardly be blamed here.

4. What are the relevant strengths of the dual vocational system in terms of later employability compared to purely school-based vocational education? How do they influence the quality of UAS diplomas per se and in comparison with similar foreign diplomas?

Chapter 2 presents the strengths (and the weaknesses) of the dual vocational education system. However, it should be noted that these become less important the longer the graduates are in employment. Therefore, we

cannot say that the dual system will generally be effective in the long run. Unfortunately, there are few empirical studies in this field, which means that one cannot reliably comment on the difference between the long-term different effects on the employability of graduates from the purely school-based system and the dual vocational education system. However, we can say that the employability of graduates from the dual system is better in the short term at least. One consideration that speaks in favour of dual vocational education is the lower youth unemployment rates in countries with such a system. Once again, the criticisms concern the poor matching of occupational structures with the design of the relevant occupational training courses. The better the match, the lower youth unemployment and the higher the employability. We can therefore deduce that purely school-based vocational training tends to have a negative effect on the short-term employability of students, especially if it continues to focus strongly on theoretical aspects. It should be noted that a comparison of graduates from the dual vocational system in Switzerland with US peers who received purely school-based vocational training in a industrial/mechanical occupation (the activities under consideration here are the full repair of an oil-fired heating burner, the installation and tuning of a television satellite dish, drafting a preliminary design of a bridge or advising clients on international bank transfers) reveal their different skills. The dual system graduates were able to identify the problem quickly, work in a targeted fashion (fewer tests and mistakes), were able to decide swiftly as a team on the work needed (fewer general discussions on the next steps to be taken) and work more meticulously. Regrettably, the acquisition of these skills varies increasingly among graduates from both systems.

The findings presented in Chapter 5 point to the fact that the employability of graduates from Swiss UAS is good. We can conclude that the education received in the dual system which places a strong emphasis on practical training may sufficiently prepare students to undertake further education at a UAS. This is also backed up by an analysis of job vacancies, which highlights that only a small share is aimed exclusively at university graduates. Admittedly, we should not lose sight of an important factor that could lead to a devaluation of practical vocational training in terms of studying at a UAS. Courses and teaching at the UAS must build on students' existing practical training and be geared towards applied research increasingly in the interests of serving business. In this way, the UAS develop their own profile, characterised by the targeted integration of the practical experience of their students. Should the UAS attempt to place a more theoretical emphasis on their teaching and offer a wider range of services for reasons of academic prestige for example, the importance of the prac-

tical skills that students from the vocational education system bring with them will be diminished. If traditional universities neglected their alignment towards the academic/theoretical because of overcrowding, inadequate selection, lack of funds and poor direction relative to the promotion of a scientific elite (this is a risk a Bachelor degree is considered as a professional qualification), doubt may be cast on the need for a dual third level education system. Due to their profile, the UAS are ultimately responsible for deciding on the importance they attribute to practical vocational training offered in the dual vocational system. The more targeted use they make of the practical skills of their students in relation to the courses they offer, their research activities and service provision, the more valuable and useful the practical vocational training of apprenticeships becomes.

5. Which practical vocational skills can be considered adequate to skills from purely academic training?

This question cannot be answered for two reasons. First, it is still difficult to provide a conclusive definition of skills. The current classification of practical experience into specialist, methodical, social and personal skills is superficial and leads to the fragmentation of learning processes (a trend clearly seen in the curricula of many schools providing general education and vocational trade/industrial schools). From a purely theoretical learning perspective, these skills should be combined with more widespread problem areas in the sciences and the labour market. Second, these skills – bar a few very general skills – can only be nurtured through course contents, as skills are more strongly linked to knowledge than is currently thought. For example, students should be prepared for their role as team leaders in a company or in an administration department. They should also learn how to solve problems in their area of expertise (which calls for specialist skills) as part of a team (which calls for social and methodical skills) and at the same time inspire confidence in their team (personal skills). For example, medical students could be given an unresolved problem in the field of gene technology to work on. The same aim can be achieved in the UAS by using the practical example of a company's business plan to illustrate certain aspects of how the world of business works. Although they differ in terms of specialist contents, both examples call for the same skills. Therefore, it makes little sense to differentiate between skills acquired during practical vocational training and those from a purely school-based vocational education. Of greater relevance are the skills to be fostered in the actual courses and the form teaching takes for the individual student

(study goals, previous knowledge and experience, concrete learning objectives of the given teaching department).

By considering skills comprehensively, it should be evident that there is little to be gained by making such a difference between skills acquired through practical training and skills acquired through school-based education let alone considering to those from vocational practical training as superior. Admittedly, this is only under the condition that these skills, in the comprehensive sense of the term, are nurtured in both practical training and school-based teaching, which is highly demanding in terms of didactic methods.

6. What skills can be recognised under the ECTS (equivalence)?

First, credit systems are formal systems which define certain parameters, such as contact hours and time required for private study, and attach credit points to them. Schools are free to design their curricula. Therefore, for a long time the German procedure of accreditation only monitored the general study objectives and the usefulness of the timetable as well as the structure of curriculum content for compliance with the formal requirements of the ECTS. In general, this approach is based on the principle of trust. No account is taken of whether the appropriate skills are promoted in individual modules or teaching units. As yet, no university has a comprehensive skills system broken down into credits.

There have been recent calls from representatives of the academic community for the linking of skills and credits to enable better comparisons of curricula. Developing the ECTS system in this way would not call into question the trust principle, but it would lead to greater bureaucracy. A more worrying consequence would be that creativity and innovation in university tuition would cease to be possible because the skills-to-credits link would become the sole basis for teaching. In the interests of quality, such measures must be avoided at all costs.

7. How should procedures be designed to ensure recognition within the ECTS or other system of this type?

This question is superfluous insofar as the ECTS remains a formal system and credits from vocational secondary schools are not recognised by UAS, as outlined in the present appraisal. The practical guidelines provided by the CUS and the KFH are a step in the right direction. Schools without

defined curricula should adapt as quickly as possible to these guidelines and concentrate solely on formulating the content of their curricula, which is a very challenging undertaking. The actual substance and not the formal aspects of the curricula are decisive for ensuring the quality of our UAS.

Bibliography

- Abraham, K. (1966). *Wirtschaftspädagogik. Grundfragen der wirtschaftlichen Erziehung* (2nd edition). Heidelberg: Quelle und Meyer.
- Backes-Gellner, U. (2003). Die duale Berufsbildung ist besser als ihr Ruf. Eine übereilte Akademisierung schwächt den Standort Schweiz. *Neue Zürcher Zeitung*, 22/23 February 2003, No. 44, 27.
- Bader, R. (2001). Berufliche Schulen – Kompetenzzentren für die Region. *Die berufsbildende Schule*, 53 (4), 105–115.
- Bader, R. & Jenewein, K. (2004). Professionalisierung für Berufsbildung sichern und erweitern. *Die berufsbildende Schule*, 56 (1), 9–16.
- Becker, G. S. (1993). *Human Capital. A Theoretical and Empirical Analysis with Special Reference to Education*. 3rd Edition (cited in Gangl).
- Blossfeld, H.-P. (1991). Unterschiedliche Systeme der Berufsbildung und Anpassung an Strukturveränderungen im internationalen Vergleich. Published by the *Federal Institute for Vocational Education and Training* (Hrsg.). Die Rolle der Beruflichen Bildung und Berufsbildungsforschung im internationalen Vergleich. Federal Institute for Vocational Education and Training, Berlin.
- BMBF-Federal Ministry for Education and Research (2003). *Berufsbildungsbericht*. Bonn: Federal Ministry for Education and Research, Bonn.
- Borch, H., Dietrich, A., Frommberger, D., Reinisch, H. & Wordelmann, P. (2003). *Internationalisierung der Berufsbildung. Strategien – Konzepte – Erfahrungen – Handlungsvorschläge*. Federal Institute for Vocational Education and Training, Bonn.
- Büchtemann, C. F., Schupp, J. & Soloff, D.J. (1993). Übergänge von der Schule in den Beruf – Deutschland und USA im Vergleich. *Mitteilungen aus der Arbeitsmarkt- und Berufsforschung*. 26 (4), 507–520.
- Deissinger, Th. (1996). Modularisierung der Berufsbildung. Eine didaktisch-curriculare Alternative zum «Berufsprinzip». In K. Beck et al. (Hrsg.). *Berufserziehung im Umbruch*. Didaktische Herausforderungen und Ansätze zu ihrer Bewältigung. Weinheim: Deutscher Studienverlag, 189–207.
- Descy, P. & Tessaring, M. (2002). *Kompetent für die Zukunft – Ausbildung und Lernen in Europa: Zweiter Bericht zur Berufsbildungsforschung in Europa – Synthesebericht*. Luxemburg: Cedefop Reference Series 5.
- Dubs, R. (1999). Auf dem Weg zu einem neuen Berufsbildungsgesetz in der Schweiz. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, 95 (3), 363–372.
- Dubs, R. (2001). Grenzen ökonomischer Prinzipien aus pädagogischer Sicht. In H.A. Wüthrich, W.B. Winter & A. Philipp (Hrsg.). *Grenzen ökonomischen Denkens*. Auf den Spuren einer dominanten Logik. Wiesbaden: Gabler, 289–303.
- Dubs, R. (2001a). New Public Management im Schulwesen. In: N. Thom & R. J. Zaugg (Hrsg.). *Excellence durch Personal- und Organisationskompetenz*. Bern: Haupt, 419–440.
- Dubs, R. (2003). *Qualitätsmanagement an Schulen*. St. Gallen: Institut für Wirtschaftspädagogik.

- Dubs, R. (2004a). Lernortskooperation aus internationaler Perspektive: Schweiz. In D. Euler (Hrsg.). *Handbuch der Lernortkooperation*. Band 1. Theoretische Fundierungen. Bielefeld: Bertelsmann, 564–579.
- Dubs, R. (2004b). *Selbstgesteuertes und lebenslanges Lernen: Versuch einer unterrichtspraktischen Begriffsordnung*. In: R. Dubs, D. Euler & H. Seitz (Hrsg.). *Aktuelle Aspekte in Schule und wissenschaftlichem Unterricht*. St. Gallen: Institut für Wirtschaftspädagogik, 56–74.
- Dubs, R. (2004c). *Bildungsstandards – ein erfolgreicher Paradigmawechsel? Ein Umsetzungsversuch als Diskussionsgrundlage im Fach Volkswirtschaftslehre*. In: M. Wosnitza, A. Frex & R.S. Jäger (Hrsg.). *Lernprozess, Lernumgebung und Lerndiagnostik*. Wissenschaftliche Beiträge zum Lernen im 21. Jahrhundert. Landau: Verlag Empirische Pädagogik, 38–55.
- Dubs, R., Prandini, M., Zwysig, M. & Käppeli, M. (1997 and 1998). *Evaluation des Rahmenlehrplans (RLP) für den allgemeinbildenden Unterricht (ABU) an gewerblich-industriellen Berufsschulen und Lehrwerkstätten*. Institut für Wirtschaftspädagogik, University of St. Gallen.
- Dubs Working Party (2001, 2002). Vorschlag und erläuternder Bericht zu “*Die Passerelle von der Berufsmaturität zur gymnasialen Matura und zur allgemeinen Hochschulreife*”, 31 August 2001 as well as “*Endgültiger Vorschlag mit Erläuterungen aufgrund des Vernehmlassungsverfahrens*”, 31 August 2002.
- Dybowski, G. (2000). Dynamisierung und Gestaltungsoffenheit der beruflichen Bildung. *Personalführung*, 33 (7), 16–22.
- Euler, D. & Reemtsma-Theiss, M. (1999). *Sozialkompetenzen? Über die Klärung einer didaktischen Zielkategorie*. Zeitschrift für Berufs- und Wirtschaftspolitik. 95 (2), 168–198.
- Euler, D. (1999). *Kooperation der Lernorte in der Berufsbildung*. Expertise für die Bund-Länder-Kommission für Bildungsplanung und Forschungsförderung im Auftrag des Bundesministeriums für Bildung, Wissenschaft, Forschung und Technologie. Nürnberg: Universität, Lehrstuhl für Pädagogik.
- Euler, D. (ed.) (2004). *Handbuch der Lernortkooperation*. Band I. Theoretische Fundierungen. Bielefeld: Bertelsmann.
- Federal Commission on the Professional Baccalaureate (2003). *Empfehlungen an die Schulen betreffend den Einbezug externer Sprachdiplome in den Berufsmaturitätsabschluss vom 14. März 2003*.
- Federal Institute for Vocational Education and Training (2001). Übergang von der Schule in die Berufsbildung. Statistische Analysen zur “Ersten Schwelle”. *Meldung 15/2001*. BIBB, Bonn.
- Federal Institute for Vocational Education and Training (2003). *Neues aus Europa*, Ausgaben 7 und 8, <http://www.bibb.de/5375.htm>.
- Fibbi, R., Bülent, K. & Piguët, E. (2003). *Nomen est omen: Quand s'appeler Pierre, Afrim ou Mehmet fait la différence*. Synthèse 4 des Nationalen Forschungsprogramms Bildung und Beschäftigung. Bern: Koordinationsstelle Weiterbildung Universität Bern.
- Frick, S.P.A. (2000). *Die Übungsfirma in der kaufmännischen Lehre. Zusammenhänge und Einflüsse auf die Entwicklung der beruflichen Handlungskompetenz*. St. Gallen: Dissertation HSG.

- Gangl, M. (2003). Bildung und Übergangsrisiken beim Einstieg in den Beruf. Ein europäischer Vergleich zum Arbeitsmarktwert von Bildungsabschlüssen. *Zeitschrift für Erziehungswissenschaften*. 6 (1). 72–89.
- Geissler, K.H. (1992). Hat das duale System der Berufsbildung noch eine Zukunft? *Schweizerische Blätter für beruflichen Unterricht*. /117) 6/7, 114–129.
- Geser, H. (1999). *Determinanten des Lehrstellenangebotes in Schweizer Industrie- und Dienstleistungsbetrieben*. Zürich: Universität, Soziologisches Institut.
- Gonon, Ph. (ed.) (1996). *Schlüsselqualifikationen kontrovers*. Aarau: Sauerländer.
- Götze, W., Marty, R. & Zeltner, E. (1998). *Modularisierung in der Grundausbildung*. Entwicklungsprojekt 10. Kilchberg: Büro für Bildungsfragen.
- Hässler, T. (1977). *Die Berufsmittelschule im industriell-gewerblichen Bereich. Berechtigung – Zielsetzung – Konzepte*. St. Gallen: Dissertation HSG.
- Hennig, H.W. (1989). *Kosten der betrieblichen Lehrlingsausbildung*. Theoretische Ansätze zu ihrer Erfassung und Fallstudien bei schweizerischen Unternehmen. St. Gallen: Dissertation HSG.
- Huptka, S. (2003). Ausbildungssituation und -verläufe. In: BFS (Hrsg.). *Wege in die nachobligatorische Ausbildung*. Die ersten zwei Jahre nach Austritt aus der obligatorischen Schule. Zwischenergebnisse des Jugendlängsschnitts TREE. Neuchâtel: Bundesamt für Statistik. 33–58.
- IAB-Institut für Arbeitsmarkt und Berufsforschung (2003). *Beschäftigten- und Arbeitslosenstatistik der Bundesanstalt für Arbeit: Berufe im Spiegel der Statistik*. VI/4. Nürnberg: IAB.
- Jaag, T. & Kummer, M. (2002). *Memorandum betreffend Bologna-Deklaration/Fachhochschulen*. Gutachten für Swiss Engineering, Zürich.
- Jeschke, I. (2002). *Berufsschulen als regionale Kompetenzzentren in Bildungsnetzwerken. Analyse der aktuellen Diskussion und Ermittlung des Handlungsbedarfs für die praktische Realisierung*. Dresden: Technische Universität. Dresdner Beiträge zur Wirtschaftspädagogik.
- Kell, A. (1985). Allgemeinbildung als Problem der Berufsschule. In P. Dehnostel, G. Heursen & G. Sattler (ed.). *Bildung und Beruf*. Zur Stellung der allgemeinbildenden Fächer an beruflichen Schulen. Königstein: Anton Hein, 31–47.
- Klieme, E. (2003). *Zur Entwicklung nationaler Bildungsstandards*. Frankfurt am Main: Deutsches Institut für internationale pädagogische Forschung.
- Kloas, P.W. (1997). *Modularisierung in der beruflichen Bildung*. Berlin: Bundesinstitut für Berufsbildung.
- Kopri, T. & Mertens, A. (2002). *Training Systems and Labor Mobility. A Comparison between Germany and Sweden*. SFB 373 Working Paper 19-2002. Berlin: Humboldt Universität.
- Lempert, W. (1995). Das Märchen vom unaufhaltsamen Niedergang des “dualen Systems”. *Zeitschrift für Berufs- und Wirtschaftspädagogik*. 3 (91), 225–231.
- Linderholm, Ch. & Parker, G. (ed.) (2000). *Qualität der Ausbildung in der europäischen Union*. UEAPM.
- Lipsmeier, A. & Pätzold, G. (ed.) (2000). Lernfeldorientierung in Theorie und Praxis. Beiheft 15 zur *Zeitschrift für Berufs- und Wirtschaftspädagogik*.
- Lipsmeier, A. (2000). Berufsschule in Abhängigkeit oder Autonomie? Lernortkooperation und Lernfeldorientierung als potenzielle Stabilisierungsfak-

- toren für das duale System. *Zeitschrift für Berufs- und Wirtschaftspädagogik*, 1 (96), 12–29.
- Lipsmeier, A. (2001). Qualitäts- und Effizienzindikatoren für die berufliche Aus- und Weiterbildung in der internationalen Diskussion. In T. Koch, G. Neumann & M. Stach (ed.). *Aspekte Internationaler Berufspädagogik – Von der Qualitätssicherung über Länderberichte zur Methodik der Vergleichsforschung*. Kassel: Universität-Gesamthochschule, 35–57.
- Lusti, M. (1981). *Die Vorhersage des Hochschul- und Berufserfolges von Wirtschaftswissenschaftlern aus Schulleistungen und Intelligenzwerten*. St. Gallen: Dissertation HSG.
- Metzger, Ch. (2001). Lernstrategien schweizerischer Berufsschülerinnen und Berufsschüler. *Empirische Pädagogik. Zeitschrift zu Theorie und Praxis erziehungswissenschaftlicher Forschung*, 15 (2), 343–361.
- Metzger, Ch., Dörig R. & Waibel, R. (1998). *Gültig prüfen*. Modell und Empfehlungen für die Sekundarstufe II unter besonderer Berücksichtigung der kaufmännischen Lehrabschluss- und Berufsmaturitätsprüfungen. St. Gallen: Institut für Wirtschaftspädagogik.
- Meyer, T., Stalder, B. E. & Matter, M. (2003). *Bildungswunsch und Wirklichkeit*. Thematischer Bericht der Erhebung PISA 2000. Swiss Federal Statistical Office, Neuchâtel.
- Meyer, Th. (2003). Jugendliche mit Migrationshintergrund. In *SFSO (ed.). Swiss Federal Statistical Office: Wege in die nachobligatorische Ausbildung*. Die ersten zwei Jahre nach Austritt aus der obligatorischen Schule. Zwischenergebnisse des Jugendlängsschnitts TREE. Swiss Federal Statistical Office, Neuchâtel. 111–118.
- Meyer, Th. (2003a). Zwischenlösung – Notlösung? In *SFSO (ed.). Swiss Federal Statistical Office: Wege in die nachobligatorische Ausbildung*. Die ersten zwei Jahre nach Austritt aus der obligatorischen Schule. Zwischenergebnisse des Jugendlängsschnitts TREE. Swiss Federal Statistical Office, Neuchâtel. 101–109.
- Mittelstrass, J. (1998). Die Zukunft des Universitätssystems und die Universität St. Gallen. In S. Spoun, E. Müller-Möhl & R. Jann (Hrsg.). *Universität und Praxis*. Zürich: Verlag NZZ, pp. 535–548.
- Moser, U. & Rhyh, H. (1996). *Evaluation der Sekundarstufe I im Kanton Zürich. Schulsystemvergleich*. Erster Bericht. Institut für Pädagogik, University of Berne.
- Mühlemann, S., Schweri, J. & Wolter, S.C. (2004). *Warum Betriebe keine Lehrlinge ausbilden – und was man dagegen tun könnte*. Die Volkswirtschaft, 77 (9), 43–48.
- Müller, W. & Shavit, Y. (1998). Bildung und Beruf im institutionellen Kontext. Eine vergleichende Studie in 13 Ländern. *Zeitschrift für Erziehungswissenschaft*, 1, 501–534.
- OECD (1991). *Review of National Policies for Education. Switzerland*. Paris: OECD.
- OECD (1997). *Economic Survey. Switzerland*. Paris: OECD (79–114).
- OPET (2002). *Kostenrechnung für Fachhochschulen*. Ein Leitfaden des BBT. OPET, Berne.

- Pilz, M. (1999). *Modulare Strukturen in der beruflichen Bildung – eine Alternative für Deutschland*. Eine explorative Studie am Beispiel des schottischen Modulsystems. Marktschwaben: Wirtschaftspädagogisches Forum.
- Pilz, M. & Papenbrock, J. (2001). Flexibilisierungs- und Aktualisierungspotentiale der neu geordneten Laborberufe unter besonderer Berücksichtigung des/der Biologielaboranten. *Die berufsbildende Schule*, 53 (7/8), 232–237.
- Rhyn, H. & Moser, U. (2001). *Input-Evaluation Zürcher Fachhochschule Winterthur*. Zürich: Kompetenzzentrum für Bildungsevaluation und Leistungsmessung an der Universität Zürich.
- Rosen, S. (1972). Learning and Experience in the Labor Market. *Journal of Human Resources*, 7, 326–342.
- Schneider, S. & Pilz, M. (2001). *Jugendarbeitslosigkeit als Gütekriterium für berufliche Bildungssysteme?* Eine kritische Analyse der zugrunde gelegten Objektbereiche und verwendeten Messinstrumente. *Zeitschrift für Berufs- und Wirtschaftspädagogik*. 97 (1), 108–124.
- Schurer, B. (1977). *Die Anfangsphase der Erwerbstätigkeit nach dualer und vollschulischer Ausbildung*. Frankfurt am Main: Haag + Herrchen.
- Schweri, J., Mühlemann, S. et al. (2003). *Kosten und Nutzen der Lehrlingsausbildung aus der Sicht der Schweizer Betriebe*. Chur: Rüegger.
- Seitz, H. (1988). *Entwicklung der Qualifikationsanforderungen in kaufmännischen Berufen – Konsequenzen für das kaufmännische Bildungswesen*. Zürich: Verlag des Schweizerischen Kaufmännischen Verbandes.
- Shavit, Y. & Müller, W. (2000). *Vocational Secondary Education. Where Diversion and where safety net*. *European Societies*, 2, 29–50.
- Sheldon, G. (1998). Die Berufslehre im wirtschaftlichen Strukturwandel. *Die Volkswirtschaft*. (4), 58–62.
- Sidler, F. (2004). Die Bologna-Diskussion ist in vollem Gange. *Fachhochschule Schweiz*, 1, 19–20.
- Smith, W. J. (1987). Time. In: M. J. Dunkin (Ed.). *The International Encyclopedia of Teaching and Teachers' Education*. New York: Pergamon Press, 372–380.
- Spirgi, S. (1986). *Die Berufsausbildung und die anschliessende Integration ins Erwerbsleben bei der Betriebslehre und bei der Lehre in einer öffentlichen Lehrwerkstatt*. St. Gallen: Dissertation HSG.
- Sporn, B. (in progress). *Study for Avenir Suisse on "Vision Hochschullandschaft Schweiz 2012"*.
- State Secretariat for Economic Affairs (SECO) (2003). *Labour market statistics (October 2003)*. SECO, Berne.
- Stalder, B. E. (2003). Schule, Arbeit, Ausbildungszufriedenheit. In SFSO (ed.): *Wege in die nachobligatorische Ausbildung*. Die ersten zwei Jahre nach Austritt aus der obligatorischen Schule. Zwischenergebnisse des Jugendlängsschnitts TREE. Swiss Federal Statistical Office, Neuchâtel. 59–79.
- Steiner, M. (1980). *Lehrplandifferenzierungen in der kaufmännischen Berufsbildung. Untersuchung zur Problematik der Differenzierung nach Neigungen im schweizerischen kaufmännischen Berufsschulwesen*. St. Gallen: Dissertation HSG.
- Strahm, R. (2003). "Bologna" – Grab für die Berufslehre? *Neue Zürcher Zeitung* of 11th April 2003, No. 85, 13.

- Strohmeier, R. (2001). Die bildungs- und berufspolitischen Zielsetzungen und Zuständigkeiten der EU sowie ihre Entscheidungsprozesse. In G. Rothe (Hrsg.). *Die Systeme beruflicher Qualifizierung Deutschlands, Österreichs und der Schweiz im Vergleich*. Villingen-Schwenningen: öbv & hpt Verlagsgesellschaft, 84–89.
- Swiss Federal Statistical Office (2002). *Berufsmaturität 2001*. Swiss Federal Statistical Office, Neuchâtel.
- Swiss Federal Statistical Office (2003). *Wege in die nachobligatorische Ausbildung. Die ersten zwei Jahre nach Austritt aus der obligatorischen Schule. Zwischenergebnisse des Jugendlängsschnitts TREE*. Swiss Federal Statistical Office, Neuchâtel.
- Swiss Federal Statistical Office (2003a). *SAKE – Schweizerische Arbeitskräfteerhebung 2002 in Kürze*. Swiss Federal Statistical Office, Neuchâtel.
- Swiss Federal Statistical Office (ed.) (2003b). *Akademiker und Akademikerinnen am Arbeitsmarkt. Wo stehen die Hochschulabsolventen und -absolventinnen vier Jahre nach Studienabschluss?* Swiss Federal Statistical Office, Neuchâtel.
- Swiss Federal Statistical Office (ed.) (2003c). *Die Entwicklung des Arbeitsmarktes für hoch qualifizierte Arbeitskräfte 1991–2001*. Swiss Federal Statistical Office, Neuchâtel.
- Swissmem (1999). *Modell-Lehrgang Polymechaniker/Polymechanikerin*. 2nd Edition. Swissmem, Winterthur.
- Swissmem (2002). *Modell-Lehrplan Polymechaniker/Polymechanikerin*. Version 3.0. Swissmem, Winterthur.
- Swissmem (2002a). *Berufsübergreifende Fähigkeiten*. 3rd Edition. Swissmem, Winterthur.
- Swissmem (2003). *Swissmem Bulletin* No. 18 of 9th September 2003. Swissmem, Winterthur.
- Timmermann, D. (1988). Die Abstimmung von Bildungs- und Beschäftigungssystem: ein Systematisierungsversuch. In: H. J. Bodenhöfer (ed.). *Bildung, Beruf, Ausbildung*. Berlin: Duncker & Humblot, 25–82.
- Topel, R. H. & Ward, M. P. (1992). Job Mobility and the career of Young Men. *The Quarterly Journal of Economics*. 107 (2), 439–479.
- Uttinger, U. (2003). *Lehrstellenabbau hat selten konjunkturelle Gründe*. Panorama, 6, 44–46.
- Wagenschein, M. (1973). *Verstehen, Lehren*. Genetisch-Sokratisch-Exemplarisch. Weinheim: Beltz.
- Weinert, F. E. (2001). Concept of Competence: A Conceptual Clarification. In: D.S. Rychen & L. Hersh Salganik (Eds.). *Defining and Selecting Key Competences*. Göttingen: Hogrefe & Huber, 45–63.
- Westholm, G. (1994). Die Arbeit des OECD-Direktorats für Wissenschaft, Technologie und Industrie auf dem Gebiet von Statistik und Indikatoren. In W. Miller & U. Schäfer (ed.). *Die internationalen Bildungsindikatoren der OECD – ein Analyserahmen*. Frankfurt a.M.: OECD/CERI-Bericht.
- Wettstein, E. (2001). Ein Modell macht Karriere. *Berufsbildung aktuell*. No. 54.
- Wettstein, E. (2002). *EURO-BAC Schweiz. Schlussbericht zuhanden des Bundesamtes für Berufsbildung und Technologie* (unpublished).
- Wilbers, K. (2002). Die Schule im regionalen Berusbildungsnetzwerk. In: BLK (Hrsg.). *Kompetenzzentren: Kompetenzzentren in regionalen Berufsbil-*

- dungsnetzwerken – Rolle und Beitrag der Beruflichen Schulen*. Bonn: BLK, 101–121.
- Wolter, S.C. & Schweri, J. (2004). Kosten und Nutzen der Berufsmatur. *Die Volkswirtschaft*, 77 (4), 26–29.
- Wolter, S.C. Mühlemann, S. & Schweri, J. (2003). Why Some Firms Train Apprentices and Many Others Do Not. *Discussion Paper IZA DP No. 916*. Bonn: Forschungsinstitut zur Zukunft der Arbeit.

Is Swiss vocational education and training (VET) EU compatible? The new federal law on VET came into force in 2004. The preparatory work involved in drafting the law gave a fresh impetus to VET in Switzerland. Professor Rolf Dubs, a specialist in this field, examines emerging issues and presents an appraisal of the Swiss dual system. Although his conclusions are largely positive, Professor Dubs stresses the need for constant reforms of the system and a closer monitoring of changes in the world of work.

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