

Memorandum

‘An Architecture for Modern Apprenticeships’
– Standards for Structure, Organisation and Governance –

--

INAP Commission
“Architecture Apprenticeship”

April 2012

At its meeting on the occasion of the 4th international conference of the International Network on Innovative Apprenticeship (INAP) in Beijing, China in May 2011, the INAP Board made the decision to establish an international commission to analyse the conditions of modern apprenticeship training. The following researchers were appointed as members of this commission:

Prof. Felix Rauner (chair)	Germany
Prof. Salim Akoojee	South Africa
Prof. Robert I. Lerman	United States
Prof. Erica Smith	Australia
Dr. Bonita Watt-Malcolm	Canada
Helmut Zelloth	European Training Foundation
Prof. Zhiqun Zhao	China

The mission of the INAP commission, chaired by Prof. Dr. Dr. h.c. Felix Rauner was to reflect on the criteria of a modern dual vocational education and training system building on the apprenticeship tradition, the management and governance of dual VET systems, and the standards and procedures for developing occupational curricula. The key questions that were taken into consideration for evaluating the operation of dual VET systems and for the formulation of standards were the following:

- How can the coordination between the vocational education and training (VET) systems and employment systems be improved?
- What are the conditions for promoting employment opportunities for young people, thus facilitating the transition from school to work?
- What are the effects on the competitiveness of companies?
- How can rewarding careers be made accessible for a large segment of the population?

Following approval by the INAP Board, the standards that have been developed by the working group are put forward in this Memorandum to the international VET community.



Professor Dr. Philipp Gonon
University of Zurich, Switzerland
Chair of the INAP Board

Table of contents

Introduction	4
Chapter 1 Criteria for modern dual vocational education	5
1.1 High quality and holistic competence in an occupational field	5
1.2 Competence to shape one's work – shaping competence', ability to independently control and manage one's professional tasks	6
1.3 Seeing 'work context' as a constitutive feature of professional work	6
1.4 Concept of 'core occupations' reduces the horizontal and vertical division of labour	7
1.5 Creating sustainable occupational profiles	7
1.6 Open dynamic occupational profiles	8
1.7 Promoting occupational identity	8
1.8 Desirable time scale for learning to be competent in an occupation	9
1.9 Need for continuing professional development	9
1.10 Cooperation between learning venues	10
1.11 The legal status of apprentices	11
1.12 Cost-benefit of in-company apprenticeship training	11
1.13 Occupational domains and vocational disciplines	11
1.14 Integration of vocational education into a higher education structure - parallel tracks	12
Chapter 2 Governance of Dual VET Systems	14
2.1 Consistent legal framework	14
2.2 Cooperation of actors	15
2.3 Allocation of strategic and operative functions	16
2.4 Innovation strategies	16
Chapter 3 Structure and development of occupational curricula	18
3.1 The curriculum	18
3.2 Methods of curriculum development	20

Introduction

Apprenticeship, the oldest type of vocational education, has experienced a revival in recent years¹. Many new countries are newly adopting apprenticeships based on what is termed the ‘dual system’ of vocational education, so called because it combines workplace learning in an enterprise with classroom teaching in an educational institute. The ‘dual system’ will be explained in detail throughout this text, but at this stage in the introduction, its four major objectives are briefly presented below:

- 1) better coordination between the vocational education and training (VET) systems and employment/labour market systems
- 2) promoting employment opportunities for young people, thus facilitating transition from school-to-work
- 3) improving the competitiveness of companies
- 4) Opening up rewarding careers for a large segment of the population.

According to international comparative innovation research one can identify a link between the attainment of these objectives and the establishment of dual training of skilled employees at the intermediate qualification level - skilled workers, master craftspeople etc.. However, the successful introduction of dual training systems in new countries is dependent on reaching the quality requirements and standards achieved in those countries with advanced systems of dual VET.

On the basis of the research findings presented and discussed at INAP conferences, the INAP Board presents this Memorandum entitled “An architecture for modern apprenticeships”. As already mentioned just above, the Board is of the strong opinion that the successful establishment of dual VET depends on certain prerequisites being fulfilled, and if not reforms will not meet the expectations of VET policy makers. Already, the inappropriate usage of “apprenticeship” or “dual VET” terms is contributing to false expectations and uncertainty among policy makers.

The Memorandum addresses the following points:

- 1) Criteria for modern dual vocational education and training systems including the establishment of a solid and reliable dual VET track (Chapter 1)
- 2) Standards for the governance of dual VET systems (Chapter 2)
- 3) Structure and development of occupational curricula (Chapter 3)

The target audiences of this memorandum are policy makers responsible for the management and organisation of dual vocational education, as well as researchers and practitioners in VET.

The INAP Board stresses that if dual VET systems are to be attractive to learners (apprentices) and enterprises, a strong commitment on the ground is required of vocational colleges, qualified teachers and trainers. It is also essential that the social partners play their role in the coordination of labour market, economic and education policies. The pluralism of institutions and actors involved in the organisation and management of dual VET necessitates a high level of cooperation,. This need for coordination is one of the main factors that distinguishes vocational education from general education, with the latter falling within the responsibility of a *single* policy sphere, namely, education policy. The success of VET

¹ Cf. Rauner/Smith (eds.) 2010.

policies requires the cooperation of different policy makers, the lack of which has often impeded many fine efforts to establish dual VET systems.

One of the main aims of this Memorandum is to address obstacles that militate against the successful establishment or expansion of modern dual VET systems. One of these is the fact that the term “apprenticeship” is associated by many policy makers, human resource managers, parents and students with an outdated concept of vocational education that does not fit the modern digital age.. This is in spite of the fact that international VET research shows that the contrary is true with modern dual VET systems demonstrating their relevance in all occupational sectors. Moreover, many countries are implementing the principle of dual vocational education in third level higher education with great success.

The members of the INAP working group, who represent the know-how of international VET researchers are familiar with the strengths and weaknesses of apprenticeship in their countries and regions – Europe, Asia, Australia, Africa and the United States. The work of the INAP commission that produced this publication - “An architecture for modern apprenticeships “ - looked at case studies in many countries as well as investigated the potential of informal apprenticeship traditions which play an important role, for example in some African countries. The ILO recognised that an upgrading of informal apprenticeships has potential for innovation in the field of vocational education.²

The INAP working group feels that new international initiatives can benefit from studying the apprenticeship standards outlined in this Memorandum, which are mainly derived from countries with advanced dual VET systems, such as Switzerland, Germany and Australia

Chapter 1

Criteria for modern dual vocational education

1.1 High quality and holistic competence in an occupational field

The unique selling point of an apprenticeship (or dual vocational education) is the production of people with a *high quality and holistic competence* in an occupation which is certified through a final assessment of professional knowledge *and* skills.

Vocational education and training initiatives result in the formation of people who can work independently in accordance with the standards defined in their occupational profile and who are recognised as experts in their occupational community of practice.

They possess a fine balance of skills and knowledge learnt through working with and learning from highly qualified staff. Their experience in undertaking real work projects under the supervision of expert practitioners, will have equipped them not only with skills and knowledge but also the contextual ‘work process knowledge’ that can only be learnt through participating in live work processes. Indeed this ‘work process knowledge’ determines the curriculum and the pedagogical approach for all apprenticeship training.

² Cf. ILO 2012.

1.2 Competence to shape one's work – 'shaping competence', ability to independently control and manage one's professional tasks

In the modern world of work, the idea of qualifying a workforce for the execution of simple tasks on the basis of detailed instructions and guidelines, is no longer tenable. This has been succeeded by the guiding principle of participation by the workforce in work processes and organisational change. Thus, instead of attempting to *adapt* employees and apprentices to existing structures one must now aim to give them the ability to shape new structures for the world of work to meet economic, social and environmental demands. This ability is summarised by the term, 'shaping competence' which is coined on the pattern of the German word, *Gestaltungskompetenz*. The concept of 'shaping competence' is based on the notion that undertaking a work task is always about finding not the "right" solution but a good one that is adequate for the situation.

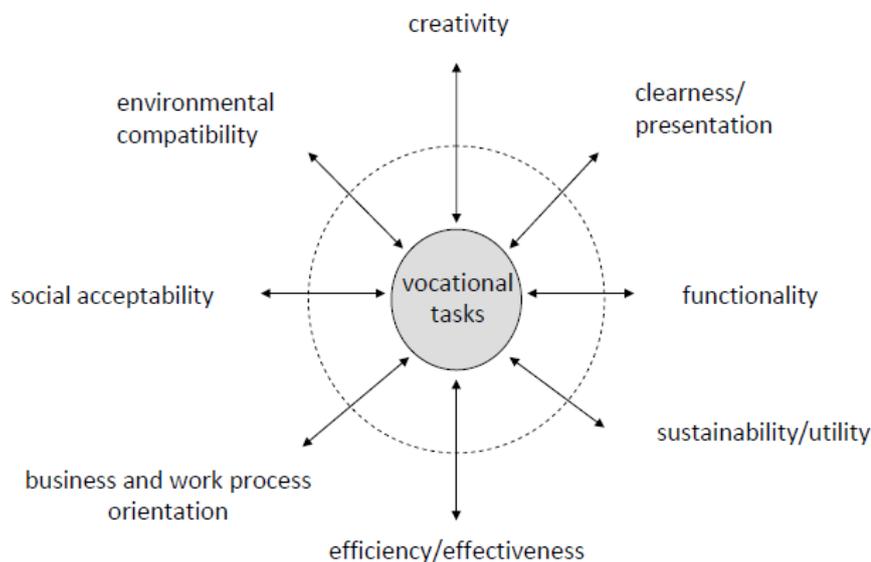


Fig. 1: Attributes of the holistic (complete) solution of occupational/professional tasks to a high quality standard

The attributes outlined in Fig 1 represent eight-dimensions which skilled workers have to match up to in undertaking a work task. All of these dimensions have to be addressed in an holistic manner in accordance with the situation if the task is to be successfully completed

1.3 Seeing 'work context' as a constitutive feature of professional work

In defining occupations in accordance with 'work contexts' (paradigmatic work situations) one disconnects professional competence from the superficial processes of technological evolution and an overly abstract analysis of skills and competence. By 'work context' we mean an identifiable area of work that comprises many complex but integrated work tasks, The retreat to abstract theoretical knowledge and the accumulation of many different qualification modules work is a barrier to the development of an integrated professional action competence or a shaping competence. For similar reasons, it is impossible to describe professional skills in terms of context-free 'key qualifications'.

The European project, which focused on replacing a variety of occupations in the automotive sector by developing one profile of an “all-round car mechatronic” occupation is an example of a modern comprehensive occupational group that enables its members to understand ‘the car as a whole’ and to carry out diagnostic and repair jobs using computer-based tools as an aid. Work processes supported by computers, electronic media and networks require professionally trained people who have a sound grasp of how networked systems work. The development of modern occupations is about producing people who can master work contexts. Therefore, task and performance oriented occupations such as “lathe operator” or “milling worker” must be regarded as outdated.

1.4 Concept of ‘core occupations’ reduces the horizontal and vertical division of labour

The division of work tasks resulting in the disintegration of work projects which is a characteristic of the *functional orientation* in work organisation is reflected in the tradition of routine-based (Taylorist) occupational structures. However, the introduction of *business process oriented* organisational structures in recent times requires specialised occupations created under the conditions of industrialisation to be superseded by *core occupations*. In the last decades countries with a well-developed tradition of apprenticeship introduced broader occupational profiles (core occupations) and managed to reduce the number of training occupations considerably (e.g. Switzerland to about 220 occupations today and Germany from 900 in 1945 to 350 today). The *principle of specialisation* was replaced with the *principle of exemplarity*. For instance, business training may take place just as well in a tourism company, a department store or a transport company. The areas in which electronic technicians can be trained are no less diverse. When trainees with their various company experiences meet in a vocational school, a process of generalisation of work process knowledge is initiated. This is the basis for the flexibility of markets regarding skilled labour and the mobility of workers. A high degree of specialisation, on the other hand, would restrict this. The introduction of flat organisational structures in today’s enterprises leads to a reversal of the vertical division of labour and opens up opportunities to relocate responsibilities to the level of the productive work processes of the company which are manned by skilled workers.

1.5 Creating sustainable occupational profiles

Public awareness of occupations, as well as the usefulness of occupational profiles for career guidance in preparation for VET and the relevance of occupational identity for apprentices and qualified employees, are all dependent on the stability of occupations. Short-lived occupational profiles or the frequent redefinition of occupations and titles reduce their attractiveness. Given that technological and economic change necessitate the development of new occupations as well as the extinction of old ones, the development of stable occupational profiles is a challenge for VET researchers and those involved in policy making and planning. The definition of occupational profiles in terms of *work contexts* is crucial for the life cycle of occupations. Accordingly one can distinguish the following characteristics of occupations according to a decreasing ‘work context’ orientation:

- timeless and long-lived occupations (e.g. physician, pilot and a large number of craft trades, service and manufacturing occupations);
- technology-based occupations (e.g. electronic technician for process engineering, CNC mechanic);
- narrow operational occupations (e.g. lathe operator).

Technology-based and operational occupations lack the essential features of modern professional work processes and contexts.. The occupation of “typesetter” is a good example of an operational occupation that is linked to the superficial aspect of a specific printing technique. However, if the professional activity of a typesetter had been defined from the very start with reference to the work context of *text design* and not narrowed to the operations of hot-metal typesetting, the history of this occupation might well have taken a different course. Under the current conditions of desktop publishing this would have led to its an enhancement of the occupation rather than its disappearance.

1.6 Open dynamic occupational profiles

Although the concept of an open dynamic occupational profile is related to a specific work context, it allows for movement across the whole range of different but related areas of application. It is open to evolution in relation to work organisation and technology, taking into account the new resulting competences required. However, this should not mean any lessening of professional standards or neglect of a professional education.

Graduates of an open occupational profile training process maintain the sense of having a professional identity even when they work in areas not directly related to their training. They are able to bring a sense of professionalism with them as they move into new territories, in particular display a confidence to shape their environment through using the ‘shaping competence’. Creating open dynamic occupational profiles means that profiles are flexible and broad enough to stand the test of time. Also public debate will be stimulated about the need to limit the number of training occupations to about 200-300 internationally recognised non-academic occupations.

Stability in occupational profiles is necessary for career guidance and the development of professional identity. It also addresses the damage caused by the continuous reinvention of job titles in enterprises with a restricted task-oriented work organisation. International and national classification systems developed for labour market statistics are not suited to the development of vocational education policies. Focusing on narrow highly specialised job profiles or “employment occupations” is not adequate as a basis for the development of vocational education policies, nor is a modular qualification and certification system, found in many national and international qualifications frameworks.³

Open occupational profiles are a response to the dialectical relationship between internationalisation and localisation. Overall, the core contents and the titles of the occupations should be internationalised, meaning that occupations have to be open to localisation, modernisation and application in new areas. Open dynamic occupational profiles also lead to the mobility of employees and the flexibility of labour markets.

1.7 Promoting occupational identity

There is a strong connection between the development of occupational competence and the development of professional identity. One cannot be effective without the other and each aspect is constitutive of the other. Research on ‘professional identity’ and ‘work commitment’ shows that existing occupations are quite different when it comes to the promotion of identity. Occupations with a low potential for the development of identity are neither attractive for school leavers nor do they form a basis for ‘work commitment’. Accordingly occupations

³ See the ILO Working Paper on the pedagogical quality of national qualifications frameworks by Michael Young (Young 2005) and Grollmann et al. (eds.) 2006.

with a low potential for identity formation are not worth pursuing. However, recent international research that has established methods for identifying factors that promote identity and work commitment can help us here.⁴

The *occupational titles* contribute to the attractiveness of occupations. They are often decisive for the choices of school leavers. Occupational titles should be largely self-explaining and be formulated under the aspect of stability over time.

Occupational identity is a prerequisite for work commitment and the associated sense of work responsibility. Occupational or professional identity is the basis of a professional ethic, which is based on intrinsic motivation. The best way to promote a professional work ethic is to give apprentices the opportunity to shape the overall context and business processes of a company and to understand how they contribute to the success of the company. Fragmented occupational structures lead to unhealthy demarcations between different departments in an enterprise.⁵ To address this in recent times, many human resource managers attempted to promote ‘organisational commitment’ based on fostering an emotional bond between employees and their company. Due to the flexibility of labour markets and the increased frequency of changing jobs, organisational commitment has become considerably less relevant.⁶ Therefore, one can conclude that today’s flexible labour markets do not lead to an erosion of ‘occupational identity’ but rather on the contrary to the increased importance of *vocational* education and *occupational* commitment. The retention of one’s occupational identity when switching to another employer has contributed to an increase in the importance of the subjective aspect of modern occupations.

1.8 Desirable time scale for learning to be competent in an occupation

The average training period for learning an occupation ranges from three to four years. A sufficient period of time is important, because immersion in an occupational culture and the process of vocational socialisation are important factors in the development of occupational competence. Integration into a ‘community of practice’ is associated not just with the acquisition of related qualifications and competences but also the development of vocational identity. This is much more than the appropriation of knowledge and skills or qualifications. For this reason, it is argued that the process of professional development is incompatible with a modularisation approach to curriculum development, which results in the disintegration of professional competence development into separate self-contained abstract components. The integrated *novice-expert paradigm* is the basis for a philosophy of vocational education and training that supports occupational identity formation.

1.9 Need for continuing professional development

Technological and economic evolutions as well as constant corporate organisational development necessitate continuing professional education. (However, it needs to be emphasised that this has to be built on a solid initial vocational education and training.)

The potential of the ‘learning enterprise’ concept, according to which learning takes place while going through work processes, in maintaining and updating one’s professional competence is often underestimated. Traditionally continuing professional development takes place in the form of seminars or courses offered by training providers external to the

⁴ Cf. Cohen 2007.

⁵ See Kern and Sabel 1994.

⁶ Cf. Cohen 2007.

enterprise. These training providers compete with colleges and universities in the open market. However, continuous change in the contents of work, for example, the automatic upgrading of computer controlled work systems, takes place as part of the work process change. This change, which indeed is often initiated by the employees, takes place at such a speed – every day – that continuing training by external providers is not able to keep up. External training thus becomes virtually impossible. Learning *for* updating work processes through external courses almost inevitably lags behind the work processes. Therefore learning for new work processes, especially in the operation of computer aided work systems, has to become a *work and learning* process. Improving the tutorial quality of the computer software is therefore a crucial task for research and development in vocational pedagogy.

Modern dual vocational education involves continuous learning building on the basis of initial training. This is best accomplished if work processes are organised as learning processes as well. Whenever professional activities become routine and non-challenging a dequalification process begins. Further, the effectiveness of any external continuing training depends on the degree to which learning is incorporated in the work process.

1.10 Cooperation between learning venues

Cooperation between learning venues, which is a core principle of dual vocational education, is based on the insight that each occupation has to be learned in live work processes after all. This principle is implemented in three versions:

- one-phase (integrated) duality or apprenticeship, i.e. a scheme where classroom teaching and learning on the job alternate at short intervals so that an immediate systematic reflection of the work experience is possible;
- alternating duality, where relatively long phases of full-time school-based vocational education are followed by similar phases of on-the-job learning in the company (e.g. internships);
- informal duality, which is characterised by an unregulated practical familiarisation with the profession on the job.

The kind of duality school and industry that is preferable is when the school-based learning phases and learning on the job phases alternate at short intervals. A duality entailing just *one* long phase each for the school and the workplace is not recommended.. The company as a learning venue cannot be replaced successfully by other types of ‘practical’ training outside the company. To allow numerous opportunities for ‘reflection on work experience’ (*reflected work experience*) a substantial amount of time for *company-based and systematic work experience* is required. This should comprise at least 50% of the entire training period. This should be based on a training plan covering the two learning venues The amount of time for school-based training should be between 25 and 50 per cent of the training period, depending on the occupation.

To ensure an adequate range and depth of work-process training in a company, it is often necessary for two or more companies to cooperate. Thus, the concept of *training partnerships* between companies with complementary or overlapping business sectors comes into play. In addition, extra courses may be required in training centres when the relevant competences cannot be learnt in the training school nor in the company. Extra assistance may also be required when the capacity for training apprentices in a modern core occupation is limited due to a reduced vertical range of manufacturing processes in a company.

1.11 The legal status of apprentices

Within their company apprentices have the status of prospective skilled workers. Accordingly they are not students who undergo an internship but employees who are subject to special regulations in the form of a training contract concluded between the apprentice (and, if applicable, his or her legal representative) and the company. The VET authorities supervise the legality of the contracts which regulate a) the training in the company, b) the timeframe for workplace training and classroom teaching c) the salary or training allowance d) the structure of the training process in line with the regulated occupational profiles and curricula.

The salary of apprentices is based on the input-output ratio of their practical work (learning in productive work processes) and the time spent in training.

1.12 Cost-benefit of in-company apprenticeship training

Research on the costs and benefits of apprenticeship training show that a three-to-four-year training programme can be organised in such a way as to cover an apprentice's costs when the apprentice training allowance is about one third of a skilled worker's wages . This applies when apprentices are predominantly young school leavers as distinct from adult learners. In the latter case financial incentives from the state would be necessary. Having made this reservation one can say that *the tendency is that the benefit of training is increasing with the training quality*. It is upon this condition that in-company dual training can be self-financing.

1.13 Occupational domains and vocational disciplines

.In advanced dual VET systems the proportion of apprentices in the employment system can vary from between four and ten per cent. An average rate of five per cent is considered appropriate. Where dual vocational education is an entry route to higher education the training rate increases above this figure, which is the case, for instance, in Switzerland.

With regard to international structures for the organisation of vocational education, nine to fourteen occupational areas have emerged. It is not possible to create a system of occupational areas or domains according to one single criterion and indeed all occupational areas are pragmatic compromises.

The structure presented by UNESCO-UNEVOC (2004) in the Hangzhou declaration has 12 occupational areas with the corresponding vocational disciplines for teacher training (Tab. 1). The open description of these occupational areas reflects the idea that an international structure has to be open to localisation.

Vocational discipline	Topics	Vocational discipline	Topics
Business and Administration	<ul style="list-style-type: none"> - Production and distribution of goods - Services - Marketing, administration, finances, insurance - Transportation, logistics, tourism - ... 	Education and Culture	<ul style="list-style-type: none"> - Child and youth care - Nursing education - Adult education - Special needs target groups - Music and dance - ...
Production and Manufacturing	<ul style="list-style-type: none"> - Manufacturing - Mechanical engineering design - Supply engineering/environmental engineering - Automotive engineering - ... 	Leisure, Travel and Tourism	<ul style="list-style-type: none"> - Travel - Sports - Tourist services - Catering and hospitality - ...
Civil Engineering	<ul style="list-style-type: none"> - Construction - Wood - Surface and coating technology - ... 	Agriculture, Food and Nutrition	<ul style="list-style-type: none"> - Agriculture - Food production - Domestic economy - ...
Electrical and Electronic Engineering and Information and Communication Technology	<ul style="list-style-type: none"> - Production systems - Building equipment - Information and communication technology - Media technology - ... 	Media and Information	<ul style="list-style-type: none"> - Printing - Electronic-advertising - Electronic-customer-service - Sales promotion - ...
Process Engineering and Energy	<ul style="list-style-type: none"> - Applied sciences - Energy conversion - ... 	Textile and Design	<ul style="list-style-type: none"> - Clothing production - Fashion - Interior design - Art and craft - ...
Health Care and Social Care	<ul style="list-style-type: none"> - Health care - Clinical care - Personal hygiene - Nursing - ... 	Mining and Natural Resources	<ul style="list-style-type: none"> - Mining - Oil and natural gas - ...

Tab. 1: 12 Vocational Disciplines (UNESCO-UNEVOC (2004): Hangzhou Declaration)

1.14 Integration of vocational education into a higher education structure - parallel tracks

The attractiveness of dual vocational education for young people and policy makers is compromised by the fact that transition to higher (university) education is limited or does not exist at all. Higher education as *academic* education is presented worldwide in a variety of classification systems and qualification frameworks, which assign vocational programmes and qualifications to the lower levels. The recognition of vocational qualifications for entry to the higher education stream is difficult especially regarding transition to discipline-specific academic degree programmes.

However, the transition from apprenticeship dual VET to tertiary education can be facilitated by a dual track system with four successive qualification levels. (See Fig 2)

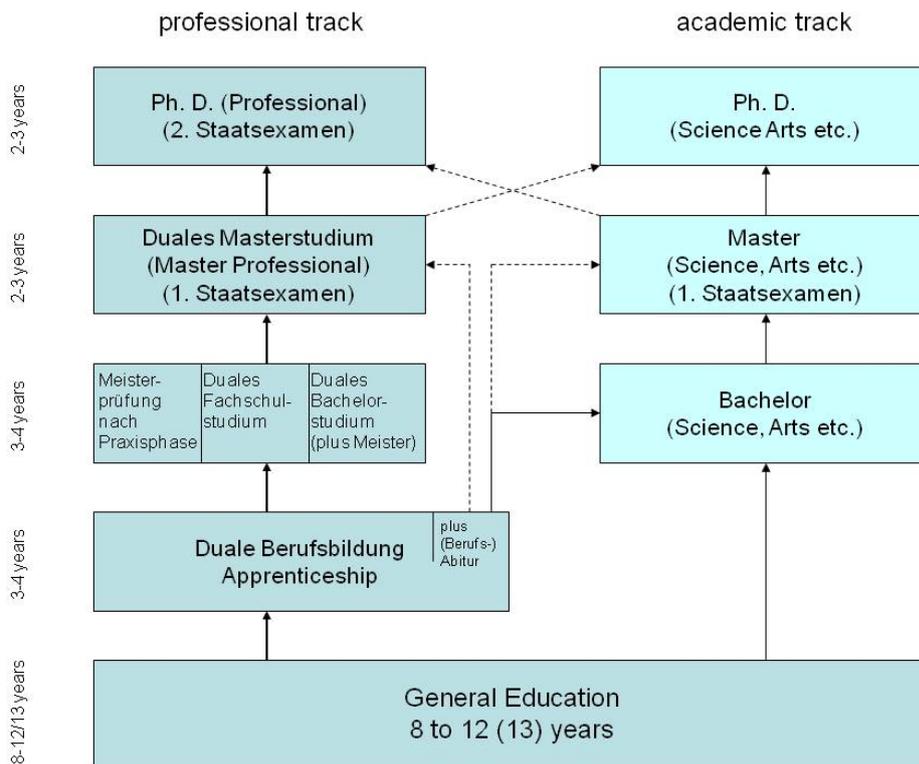


Fig. 2: Architecture of parallel tracks with a dual vocational track

Level 1 (upper secondary level): dual initial VET (3-4 years) with the option to acquire a VET-based university entrance qualification (according to the Swiss model)

- Level 2: tertiary education**
- 2-3-year dual VET college programmes following a completed dual IVET programme and relevant professional experience
 - continuing vocational education and training leading to the qualification of master craftsperson
 - dual degree programmes at universities of applied sciences following a completed IVET programme
 - dual Bachelor programmes (3 years)
 - Bachelor + master craftsperson
 - Bachelor + dual IVET
 - dual vocational Bachelor programmes (Bachelor Professional)

Level 3: dual Master programmes

The establishment of dual Master programmes for graduates of level 2 programmes aims at the qualification of senior managers. The basis for the qualification process is the study of contextual knowledge. The latter is essential for the solution of complex and interdisciplinary tasks and problems.

Level 4: Graduate schools

At the level of education of future researchers (graduate schools) the dual track is continued by doctoral programmes that are concerned with the study of contextual knowledge. The analysis and shaping of the world of work taking into account the interplay of technology, work and education and different industrial cultures requires a high level of study regarding

the use of professional and contextual knowledge. The traditional academic doctorate, on the other hand, differs from the professional doctorate presented here in that it investigates a very specific topic in great depth. The orientation of basic academic research in a specific discipline has the advantage of generating new knowledge in a vast array of highly specialised areas. At the same time there is the disadvantage that the contextual knowledge, which is crucial for professional behaviour and responsibility towards the (social) environment, is not taken into consideration.

Chapter 2

Governance of Dual VET Systems

Dual vocational education and training systems require plural governance structures which include the government departments of education, economics and employment and labour as well as business associations and educational organisations. To ensure a coordinated plural governance, the conditions outlined below have to be met.

2.1 Consistent legal framework

2.1.1 A single vocational education and training act

A consistent legal framework is present when vocational education, except tertiary vocational education, is regulated by one single act. A reduced type of single regulation is at hand when several legal acts in the same area supplement each other and constitute a single framework that is based on a single legislative power (e.g. national education laws). A consistent framework is absent when the rules that govern vocational education belong to different legal domains (e.g. educational law, commercial law) and different areas of policy making.

For practical reasons vocational education and training is allocated to one policy area, which leads to the neglect of other policy fields (education, economic, labour market and social policy). It is necessary to achieve a balance between the various objectives already at the level of the legal framework.

2.1.2 Concentration of legislative competences

Concentration of legislative competences means that the enactment of laws is within the responsibility of only one level of government. There is no such concentration when the rules governing VET are included in laws that are enacted by different jurisdictions (national level, regional level etc.). On the other hand there are examples of complementing legislation according to which the national government is responsible for the overall guidelines while the implementation is the business of the regional level. This would be consistent with the principle of subsidiarity.

2.1.3 Integrated procedure for the development of VET curricula

This means that the regulation of occupational profiles is coordinated in a single and unified process. This is the case when the gradual specification of profiles down to the level of concrete curricula and training regulations takes place in successive steps of decentralised and increasingly concrete specification. The procedure is fragmented, on the other hand, when there is a vertical (federal level, regional level, training institutions) and horizontal (e.g. separate responsibilities for curricula and examinations) diversification of activities.

2.1.4 Binding regulations on the cooperation of learning venues

The quality of vocational education strongly depends on a reliable framework for the cooperation of vocational schools, training enterprises and, where appropriate, training centres. If a given vocational training act applies to all learning venues it is possible to enact mandatory regulations concerning the cooperation among them, in which case the quality of the regulations has to be assessed. If, on the other hand, the learning venues enterprise and school are subject to different legal spheres, the quality of cooperation is usually compromised.

2.2 Cooperation of actors

2.2.1 Legal regulation of responsibilities

It is necessary for the law to define the responsibilities of the actors adequately. What is crucial is that their competences and interests are adequately represented in the system of coordinated plural governance. This applies to the government departments, the organisations representing the business community as well as those representing the local VET institutions. This principle includes mandatory rules for the cooperation of actors in the shape of a coordinated VET governance.

2.2.2 Involvement of social partners, VET schools and researchers in a VET dialogue

A coordinated plural governance of dual VET guarantees that the actors and stakeholders can participate in the VET dialogue at the national, regional and local levels according to their competences and interests. This applies especially

to experts from the social partners, the VET schools and VET research.

The pluralism of policy objectives is represented by the involvement of different actors and institutions. The realisation of a good balance is a prerequisite for a coordinated plural governance of dual VET.

2.2.3 Coordination of the VET dialogue

The quality of the VET dialogue depends on the presence of a moderating and coordinating institution that has the competence to fulfil this coordinating role for the entire system of vocational education.⁷

2.2.4 Regulatory procedures require an early coordination of the actors involved.

Here the question is how the initiative rights of the actors, the early utilisation of experience gained in the practice of VET and a possible piloting function of qualification research should be regulated in the procedure of curriculum development. A limitation of the right of initiative for single actors should be avoided. Occupational research, diversified according to occupational fields and integrated into VET and labour market research, serves as the basis for drafting occupational profiles and training regulations. The process is supported by experts of the social partners.

Occupational profiles, training regulations and training plans are an outcome of empirically identified qualification requirements as well as normative guidelines that are derived from the objectives of vocational education. In addition there is the need to find a compromise between the demand of single companies for “matching” qualifications, the interest of the economic sector in broader occupational profiles and the interest of the individual in a career. These heterogeneous interests and the underpinning political orientations are mirrored in the curriculum development procedures. It is the role of the national and local VET dialogue to find a balance between the policy areas and to identify the associated options.

⁷ An example of good practice is the Federal Office for Vocational Education and Technology (BBT) in Switzerland.

2.2.5 Institutionalised cooperation of learning venues

The cooperation of learning venues takes place in practice and on the spot. This requires adequate forms of the cooperation between schools and companies, teachers and trainers, e.g. by means of occupation boards. In these bodies the teachers and trainers of a given occupation, occupational area or vocational discipline are cooperating on the basis of relevant (legal) norms. Their mission consists above all in the implementation of new occupational profiles and curricula, the coordinated instruction of the apprentices on the basis of a joint (self-)evaluation that accompanies the training process, bilateral training projects as well as the organisation of examinations.

2.3 Allocation of strategic and operative functions

2.3.1 Legal regulations concerning the collaboration of strategic and operative functions

In the ideal case the national level is in control of the strategic functions and the lawmaking capacity for the overall framework. Operative functions are fulfilled at the regional and local levels. Research and development, however, can be situated at any level. It is a sign of bad practice when operative functions, which concern, for instance, the concrete implementation of vocational learning processes, are fulfilled by actors at the national level. A symptom are lengthy and detailed curricula and centralised guidelines for the design of practical examinations. Another aspect is the limitation of the options of local actors, who are reduced to a role of acting only upon instructions.

2.3.2 The tasks and responsibilities are distributed according to the principle of subsidiarity.

The strategic management of vocational education by one actor also must strictly observe the principle of subsidiarity. This is the only way to exploit the potentials for innovation that are inherent in the practice of vocational education.

2.3.3 The development of occupational profiles and (framework) curricula takes place at the national level while the responsibility for setting up syllabuses and training plans is with the local actors.

This means that the concrete implementation of curricula is left to the actors at the local level. If the output orientation is emphasised too much, there is the danger that occupational profiles and quality standards erode. Therefore strong input factors are required, e.g. occupational profiles that are transformed into lean training plans open for localisation, and the definition of examination standards that are open for local implementation. Guidelines for the organisation of training processes, an effective vocational guidance as well as tools for evaluating the training quality and the cost-benefit ratio are essential for the balance of input and output oriented management.

2.3.4 Relative autonomy in the implementation of curricula

The strong point of training enterprises is their potential for learning in qualifying work processes. The work tasks and processes that are influenced by the heterogeneity of business areas necessitate a local compromise between the contents of company-based training and the general requirements of VET, which are formulated in the training regulations. This includes the integration of new areas of application and the ensuing qualification requirements.

2.4 Innovation strategies

2.4.1 Legal basis

Innovation in all parts of society is based on the interplay of politics, practice and research. Any deficit in one of the three factors is likely to weaken the innovation potential of the

others. This applies to the potential of vocational education, too. VET research is underdeveloped in many countries. To establish VET research means to set it up as a non-university research branch at the national level, e.g. by a national institute or network of institutes, and to connect it with VET planning and VET policy. The introduction of master programmes for the qualification of VET teachers as well as the establishment of graduate schools are essential requirements of VET research.

2.4.2 Qualification and curriculum research and development

The development of occupational profiles and the corresponding curricula reaches a high level of quality when it is organised as a process of innovation. The internationalisation of economic development suggests an involvement of relevant international organisations and international VET research in the process of curriculum development. Qualification and curriculum research includes the identification of occupations that are established internationally and meet the standards of modern occupations (chapter 1). This applies also to the methods of curriculum development.

2.4.3 Improvement of the cooperation of learning venues as a topic of innovation programmes

Empirical analyses on the cooperation of learning venues show that the organisation of integrated types of dual VET is a great challenge for the actors involved. The potentials of cooperation are often left unused. Therefore this is a field of VET research that is crucial for quality assurance in dual VET.

The potential of the cooperation of learning venues is not fully exploited when the cooperation is limited to the side by side implementation of teaching and training. What is necessary is a common curriculum that recognises the potentials of the different learning venues. The areas of professional activity and learning have to be formulated in a way that is open for development and application. The concrete implementation is a task for the local VET dialogue.

2.4.4 Training partnership

The specialisation of enterprises, especially in the context of supply chains, is associated with a limitation of business areas. A consequence is that many enterprises with instructive work processes are excluded from vocational education and training. The cooperation of enterprises with complementing business areas would make it possible to offer high-quality training for an occupation in its entire breadth and depth. This type of training partnership requires a particular VET management that could be external or integrated into the partnership. Experience shows that the apprentices can also take part in the organisation of the partnership, thereby acquiring additional social competences. The training contracts with the single enterprises are not affected by the partnership. Training partnerships are a qualitative and quantitative extension of the training potential and increase the profitability of training. In many cases they render the establishment of external training centres unnecessary.

2.4.5 Measuring and evaluating professional competence (development)

International VET research contributes to the identification of the scientific foundations for the organisation of VET as the interplay of reflected work experience and acquisition of work process knowledge. It also contributes to transforming these foundations into international standards through VET planning and practice. The characteristic features of vocational education become increasingly visible in this process.

The instruments for the measurement and evaluation of professional competence that were developed in the context of international comparative competence assessment have extended the opportunities for establishing effective procedures for quality assurance. An international cooperation beyond the existing bilateral projects is desirable.

2.4.6 International VET dialogue

The international VET dialogue is intensified by the ongoing internationalisation in the field of economic and technological development, and it is supported by the continuous expansion of international cooperation in science and research. The international VET dialogue is emerging at three levels:

1. The level of VET research, represented by organisations like
 - the Asian Academic Society for Vocational Education and Training
 - VETNET (the European network of VET researchers under the umbrella of the European Educational Research Association)
 - INAP (the International Network on Innovative Apprenticeship).
2. The intermediary VET dialogue, represented by organisations like
 - ILO (International Labour Office)
 - UNESCO UNEVOC with more than 200 UNEVOC centres worldwide
 - ETF (European Training Foundation)
 - OECD (Organisation for Economic Co-operation and Development).
3. The political processes at the international level (e.g. at the G20 level or at the level of the European Union) can only contribute to a new quality of the international VET dialogue if they are considered as one of the three “pillars” of organising innovation, the two others being the research community and the practitioners. Here the need for development is quite urgent.

Chapter 3

Structure and development of occupational curricula⁸

3.1 The curriculum

The content and objectives of a VET programme for a given occupation are outlined in a curriculum that offers guidance to trainees, trainers and other actors involved in the training process. The curriculum documents the competences that constitute the holistic professional competence to be attained on the completion of training.

The occupational curriculum is derived from the *professional work tasks a qualified person is expected to be able to undertake*. The tasks and situations have a paradigmatic quality⁹ for the occupation in question and have a potential for *development tasks*. The curriculum for a training occupation is termed an *integrated vocational education and training plan that serves as a basis for the design of vocational learning processes at both learning venues in the dual system - the enterprise and the vocational school*.

This integrated VET plan includes:

⁸ Cf. Dittrich (ed.) 2008.

⁹ Cf. Benner 1984.

An occupational profile

The occupational profile consists of a brief description of the range of professional tasks, and is open to new areas of competence as well as those to be acquired during the training process.

A description of the learning areas, building upon each other (Fig. 3)

A curriculum based on a developmental logic and aimed at a ‘shaping-oriented’ vocational education needs to fulfil two criteria:

(1) The contents and objectives of training must follow a developmental logic, with the different work and learning features oriented towards the work process.

It is a prerequisite that the professional tasks outlined in the curriculum are identified and formulated in such a way that allows a beginner to utilise his or her existing competences, and meet expectations in making the transition to an apprenticeship vocational education. The learning areas that build upon prior experience are designed in a way to support development in accordance with the ‘novice to expert’ paradigm (see Fig 3).

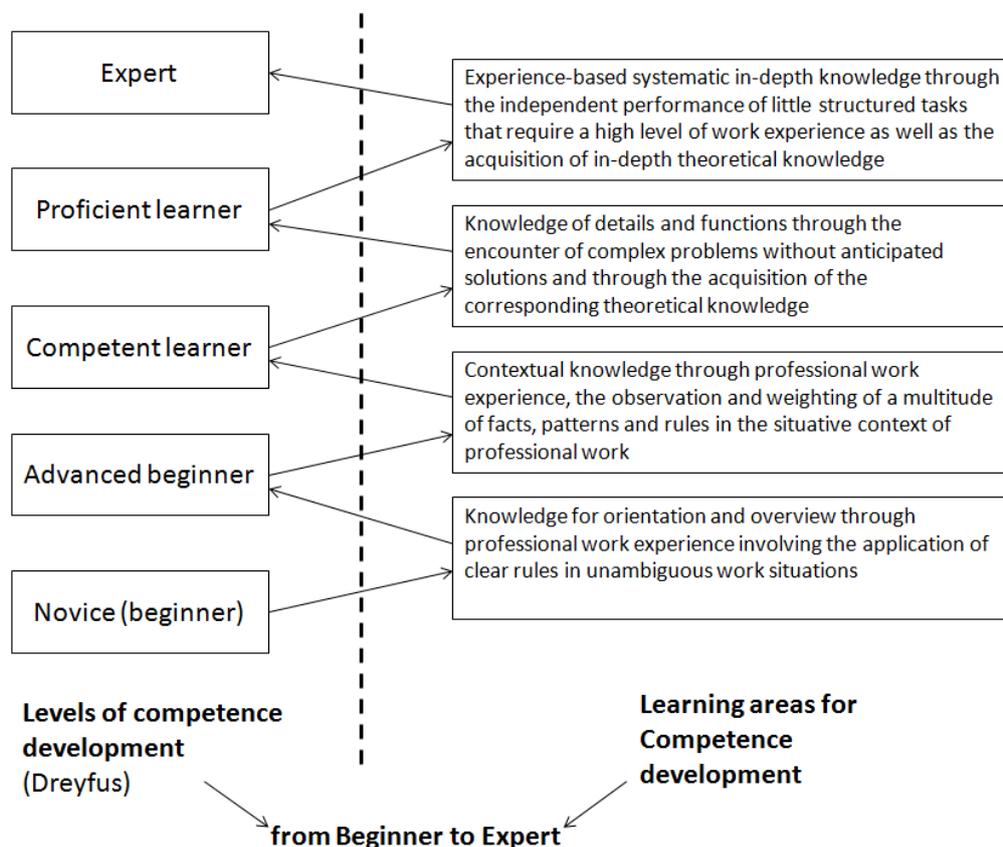


Fig. 3. The four learning areas from novice to expert

(2) The arrangement of characteristic professional tasks in *learning fields* in accordance with a developmental logic constitutes the curriculum. These provide a structure for dual vocational education and training in relation to content and time schedule. Learning fields include the characteristic tasks and the corresponding learning objectives to be addressed in the school and workplace (see Fig. 4).

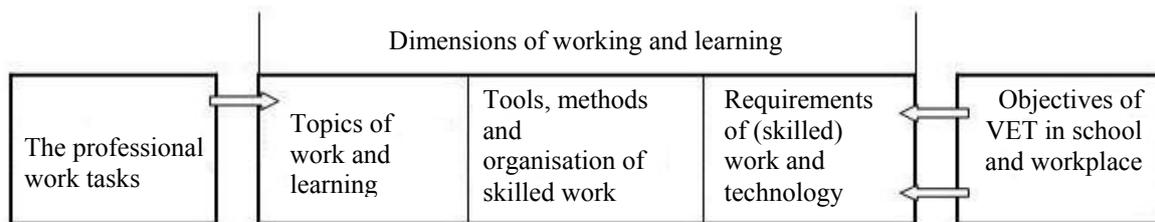


Fig. 4: Structure of a learning field

Thus the curriculum represents the empirical reality in the world of work as well as the corresponding and transcendent educational objectives. Accordingly, the curriculum also mirrors the tension between qualification and education or between *human resources development* and *personal development*.

Content of work and learning

These can be classified according to three categories:

1. topic of work and vocational learning,
2. tools, methods and organisation of professional work,
3. technical, environmental, economic and social requirements for the organisation and shaping of professional work (see Fig. 4).

Educational objectives specific to the learning venues

The curriculum for classroom teaching differs from the one for workplace learning only in the learning objectives that are specific for the learning venues. These objectives describe the perspective under which the learners are to deal with the topic at each of the learning venues and how the learning processes at both locations are to complement each other.

3.2 Methods of curriculum development

*Sector studies*¹⁰

The function of sector studies is to support the efforts of the social partners and the public bodies in sector oriented curriculum development. Empirical studies focus on the employment and enterprise structures in the sector, the relevant business areas as well as the activities and traditions concerning initial and continuing vocational education and training in the sector (SWOT analysis – analysis of strengths, weaknesses, opportunities and threats).

Expert worker workshops

Expert worker workshops identify the characteristic work tasks of an occupation as a basis for curriculum development. The professionals participating in the workshops are selected according to three criteria:

1. Expert workers who by virtue of their professional competence and current professional work context represent, have the experience to collaborate in the prospective identification of work tasks in a specific occupation.

¹⁰ Rauner and Maclean (eds.) 2008, Chapter 3.1.2

2. Expert workers do not represent the current practice constituted by the organisational structures in the company but a professional practice that is innovative and future-oriented for a given occupation.
3. The competence of experts and professionals is based predominantly on reflected work experience ('know how' and 'know why'). Their work process knowledge enables them to estimate future developments for the occupation or occupational field in question.

Validation of professional work tasks

Participants in the *external validation* are

- researchers with expertise in occupation studies,
- experts from the world of work
- trainers and teachers.

The experience of the external experts is used to amend the list of characteristic professional work tasks, if necessary, and to estimate the potentials for workplace learning and competence development.

Open curriculum

Occupational profiles and vocational curricula need to be open to

- technological innovation,
- regionalisation
- new business activities,
- organisational development in the training company and
- connectivity of initial vocational education and training with continuing vocational education and training.

The concrete training plans are developed collaboratively by the vocational schools, training companies and institutions representing the business community.

Bibliography

- Benner, P. (1984): From Novice to Expert: Excellence and Power in Clinical Nursing Practice. Menlo Park: Addison-Wesley.
- Cohen, A. (2007): Dynamics between Occupational and Organizational Commitment in the Context of Flexible Labour Markets: A Review of the Literature and Suggestions for a Future Research Agenda. Bremen: Institut Technik und Bildung, Universität Bremen. (ITB-Forschungsbericht 26/2007).
- Connell, M. W.; Sheridan, K.; Gardner, H. (2003): On Abilities and Domains. In: Sternberg, R. J.; Grigorenko, E. L. (Eds.) (2003): The Psychology of Abilities, Competencies and Expertise. Cambridge: Cambridge University Press.
- Dittrich, J. (ed.) (2008): Curriculum Design: From professional tasks to education and training plan. Bremen: Institut Technik und Bildung, Universität Bremen.
- Fischer, M.; Rauner, F. (Hg.) (2002): Lernfeld: Arbeitsprozess. Baden-Baden: Nomos, 317–339.
- Grollmann, P; Spöttl, G.; Rauner, F. (eds.): Europäisierung Beruflicher Bildung – eine Gestaltungsaufgabe. Münster: LIT Verlag.
- ILO (International Labour Office, Skills and Employability Department) (2012): Upgrading informal apprenticeship: A resource guide for Africa. Geneva: ILO.

- Kern, H.; Sabel, C. (1994): Verblaßte Tugenden. Zur Krise des deutschen Produktionsmodells. In: Beckenbach, N.; van Treeck, W. (eds.): Umbrüche gesellschaftlicher Arbeit. Soziale Welt, Sonderband 9. Göttingen, 605-625.
- Lave, J.; Wenger, E. (1991): Situated Learning: Legitimate Peripheral Participation. New York: Cambridge University Press.
- Rauner, F.; Maclean, R. (eds.) (2008): Handbook of Technical and Vocational Education and Training Research. Dordrecht: Springer.
- Rauner, F.; Smith, E. (eds.) (2010): Rediscovering Apprenticeship. Research Findings of the International Network of Innovative Apprenticeship (INAP). Dordrecht: Springer.
- Schön, D. A. (1983): The Reflective Practitioner: How Professionals Think in Action. New York: Basic Books.
- UNESCO-UNEVOC (Veal, K.; Dittrich, J.; Kämäräinen, P. (2005): UNESCO International Meeting on Innovations and Excellence in TVET Teacher/Trainer Education. Report. Bonn.
- Young, M. (2005): National Qualifications Frameworks: Their feasibility for effective implementation in developing countries. Diskussion Paper, Skills and Employability Department. ILO Skills Working Paper No 22. Geneva: ILO.