Chapter 7
TVET Planning and Development

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Abstract There are changes in society and labour market demands made to TVET and in the TVET system itself. To deal with both types of challenges, the aim for TVET planning and development is to anticipate how employment will evolve and to determine how to give individuals a knowledge base that will enable them to adapt to the changing demands and benefit from the mobility. Major research areas connected to relevant problem areas in the TVET planning and development process can be constituted by analysis of labour market developments and changes in learning contents, new insights into the development of skills, competences and expertise, integration of learning places in school and workplace, professional development of VET teachers and trainers and VET and organisational development in organisations.

7.1 New Challenges for TVET Planning and Development

Technical and vocational education and training are important because a country cannot achieve economic and social development without a skilled, productive labour force that can meet the changing requirements of its environment (OECD 2010). It is also important because it can offer better educational choices and pathways for disadvantaged youth. TVET planning and development is, therefore, an important field of research. It is a complicated topic because of the great variety of occupations, economic sectors and changing economic and labour market contexts. Another complicating factor is the complexity of TVET educational system characteristics and the great number of stakeholders with different interests.

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As a general observation, it could be stated that relevant concepts, approaches and research issues since the 1990s have been changing in response to changes in societal and labour market demands made to TVET as well as in the TVET system itself. Interestingly, comparable changes seem to occur across the globe in very different economical and societal systems.

These changes could be summarised as a multi-level transformation process of manpower demand driven, reactive and reproduction-oriented VET planning and curriculum design towards more open, dynamic, shaping and career-oriented approaches of organisational as well as professional development in flexible VET systems (Nijhof et al. 2002; OECD 2010). This transformation is prompted by changes in technology and organisation of work, resulting in growing demands on work-content-related knowledge and competences as well as work process knowledge, key qualifications or core skills (Boreham et al. 2002; Zhao et al. 2011). Also, TVET systems have to respond to changes in the economic structure, i.e. the rise of employment in services compared to industry or the development of new inter-relationships between industry and agriculture.

But there are also important changes in the development of the educational system itself. The number of students as well as the length of time they stay in some sort of education have grown considerably during the last twenty years. Further growth is to be expected, especially in rising economies in Asia and South America. In many countries, general and vocational education are still separate educational pathways with different esteem. But a typical educational career in many countries now includes both general and intermediate or higher vocational education. The number of students in VET on all levels is growing, maybe with some exception of countries where vocational education traditionally had a strong position, like the dual system in the German-speaking countries. There is, also, in many countries a growth in hybrid qualifications, that is vocational qualifications giving right of entrance to higher education (Deissinger et al. 2013).

Changes in TVET respond to both types of challenges. They include the establishment of new apprenticeships across the globe from Europe to Australia (Rauner and Smith 2010) or sub-Saharan Africa (Atchoarena and Delluc 2001) as well as the rise of school-based vocational trajectories and new TVET pedagogies and training concepts (Onstenk 2001). Also new pathways from vocational to higher education are opened (De Bruijn 2006). TVET is now expected to prepare students for occupational life in the broadest sense, sometimes referred to as employability, rather than preparing them only (or even primarily) for the immediate demands of the labour market at a given point. Also, in many countries, institutional policies have shifted focus from input to outcomes, through new financing and certification mechanisms, involving social partners more in governance, granting more autonomy to educational institutions as well as promoting private providers and company-based training. Policies concentrate on establishing new forms and new structures of regulation providing incentives to employers and individuals for increasing investment in training, and to providers to better match skill needs (Atchoarena and Delluc 2001).

The aim for TVET planning and development, then, becomes, on the one hand, to anticipate how employment will evolve and, on the other, to determine how to give individuals a knowledge base that will enable them to adapt to changing demands and benefit from mobility (Kirsch 2005). This takes the form, for example, of designing frames of reference for VET based on cutting edge, innovative practise rather than on the routine demands typically made by companies. But also research is looking for ways to improve versatility of skilled workers by broadening qualifications and providing them with core competences (Onstenk and Brown 2002).

This transformation process is going on in most developed countries, but gets specific characteristics depending on the presence of an elaborated specific VET system. In countries with no well-established system of vocational education, like the Anglo-Saxon, Southern European or many 'third world' countries, in the strictest sense, there is no or only very limited TVET planning and development on a system level. Nevertheless, questions with regard to the role of education in (re)producing a qualified labour force, or to the relationship between professional and organisational development are becoming more important in all countries as a result of the rediscovery of human capital and competences as an economic asset in the global competitive economy. Increasingly, countries are recognising that good initial vocational education and training, but also secondary and higher vocational education give a major contribution to economic competitiveness (OECD 2010). Many countries recognise the need for change from a low skill to a high skill economy (Brown et al. 2000).

Major research areas are connected to relevant problem areas in the TVET planning and development process:

Analysis of labour market developments and changes in curriculum contents;

- New insights into the development of skills, competences and expertise;
- Integration of learning places in school and workplace;
- Professional development of VET Teachers and Trainers;
- VET and organisational development in organisations.

7.2 Labour Market Developments and Curriculum Content

A first relevant theme, which deals with probably the most important planning question for TVET, is the analysis of changing numbers, pathways and contents of TVET, taking into account labour market developments as well as curriculum changes. TVET systems everywhere are facing challenges to prepare a sufficient number of people with the right skills to meet labour market demands. Matching skills, knowledge and attitudes to the needs of employment is increasingly challenging in the context of globalisation and rapid technological change, resulting in a constant reconfiguration and transformation of occupations.

The analysis as well as the translation into curricula is influenced by the degree in which professional work is organised in occupations with a more or less recognised status in the economic as well as labour relations system. In some countries there is a dominance of strong forms of occupational identity, in other countries this is weakly developed. There can be different labour market systems: (1) internal labour markets systems and (2) occupation-based labour market systems. The systems differ in their relations to the education system. In countries with an internal labour markets system, newcomers to the labour market start their career in low qualified jobs, learning on the job and additional courses will help them to acquire the competences needed for a career. The relation to the education system is rather loose. The United Kingdom, France, Ireland and Belgium are countries with an internal labour markets system. In countries with an occupation-based labour market system (Germany, the Netherlands, Denmark) it is the role of the vocational education system to qualify young people for the labour market.

All TVET systems need mechanisms to make sure that the number of people trained in different occupations matches labour market needs (OECD 2010). A critical issue for TVET planners and managers is how to train individuals for future jobs on the basis of information covering past and present work, enterprises and labour markets. This is a difficult task because of the changes in companies and labour market and because of the problems employers have to determine what kind of skills they will need in a couple of years, and also because VET cannot respond only to employers demands. Publicly funded provision needs to serve the interests of the whole society by balancing student preference and employer demands (OECD 2010).

Student preferences are relevant—if only because of the importance of motivation for study success—but such preferences on their own are usually not enough. A situation where many students choose an attractive, but dead-end qualification, causes both societal problems and personal disappointment.

While employer needs are important, it is not always easy to establish what those needs are, or how they will evolve. Forecasting what kind of jobs will be available in 6–8 years' time (the time that evolves between identifying a new need, designing a course, delivering it and students leaving with a certificate) is extremely difficult in a changing and fluctuating economy. And the same is true for forecasting exact skill demands for jobs in 5 years' time. The speed of change is too high. So, forecasting trends and probabilities becomes important.

There is an elaborated tradition of analysis of occupational profiles and trends as a source for training curricula, curricular frameworks and the related syllabuses for in-company as well as school-based vocational education and training. Profiles are always based on some form of investigation of qualification requirements. All countries with (i.e. Germany, Netherlands or Australia) or without (i.e. USA or England) advanced TVET systems have developed or are developing schemes of qualification research, in connection with introducing or upholding up-to-date qualification frameworks. Vocational certificates or 'qualifications' denote the knowledge, skills and attitudes that are defined as necessary for the performance of a specific set of professional tasks (Rauner 2009). The investigation of

Table 7.1 BIBB model of the development of proposals for training curricula (Benner 1996, 59)

Problem description
– collection of data on technical, economic and social developments
– insights into work and training situations
– formulation of hypotheses:
– work contents and requirements
– necessary skills, knowledge and patterns of behaviour
Case studies/Testing of the hypotheses
– examination of selected workplaces
– recording of the work contents and requirements in breadth and depth
– identification and structuring of skills, knowledge and patterns of behaviour
Task analysis/Representative surveys
– identification of the scope of requirements for areas of activity and occupational fields
– generation of the data basis for the content and structure of training programmes
Evaluation and curriculum development
– selection of training contents
– structuring of training components with regard to content and temporal sequence
– formulation of a proposal for the training regulation with statements on occupational profiles related to: structure, contents, duration, qualification title(s) of the new training programme(s)

qualification requirements represent the objective side of professional skills and knowledge. What underlies a working concept of qualification is the category of the complete professional action: the connection of planning, performing and evaluating professional tasks (Rauner 2009). In countries which use a more technocratic task analysis like the UK, Australia or at some stages the Netherlands, qualifications tend to become too detailed, inflexible and with little educational value (Brown and Onstenk 2002).

Much more than the development of the curriculum in general education, the development and modernisation of occupational profiles and training curricula is considered a prerogative of TVET experts and economic sectors. The public authorities responsible for education and economy usually trust domain experts more than others to have the competence for developing training curricula. Here, a division of labour has emerged between the experts of professional associations or large companies and qualification and curriculum research, according to which the cornerstones for the design of occupations and the basic structures of vocational curricula are defined by the experts of business organisations, whilst the details are delegated to the researchers (Rauner 2009). In many countries, these tasks are exclusively fulfilled by employers experts, without the participation of unions or TVET research. In many new apprenticeship programmes in Australia, United Kingdom or the United States, the contents of apprenticeship programmes are defined by the representatives of the involved enterprises.

At the core of curriculum analysis there are questions of the specificity, the occupation-relatedness and the adequacy of the qualifications to be transferred in the different trades (Table 7.1).

The results of the evaluation are used for improving the implementation of newly regulated occupations, occupational groups and occupational fields as well as for the further development of occupations and professional regulations.

In principle, such frameworks can make VET systems more transparent so that the value of different qualifications can be more clearly recognised by students, employers and other stakeholders (OECD 2010). Implementing a qualifications framework should be seen as part of a wider approach to quality and coherence in VET provision. Qualification typifies the 'labour market' facet of the relationship between training and employment. The term not only carries the notion of 'skills', but also the connotation of something that has been 'negotiated'. In this negotiation there could be confronted the lifetime perspective of a qualification and whether it prepares an individual in the short term for a particular job or also prepares the individual future developments, including possible career development and/or sideways moves into a new occupation.

7.2.1 Hybrid Qualifications

Across the globe more and more students in vocational education now expect to enter tertiary or other postsecondary education (OECD 2010). If the occupation at which a qualification is aimed is defined too narrowly, or the curriculum is too strongly vocational, the qualified worker will not be able to progress within the education system. Conversely, a vocational qualification used to gain access to higher education can lose part of its vocational content and, hence, of its value on the labour market (Méhaut 1997). Of course, this risk is less, if higher education itself becomes more professionally oriented (Zhao et al. 2011).

Qualifications also denote the professional actions as determined by the design and organisation of work (division of labour). An extended concept of qualifications emphasises the ability to reflect and to participate in changing and shaping the conditions of work (Rauner 2009). For the investigation of qualification requirements, this entails the consequence that the characteristic work settings of an occupation have to be examined. Qualification research is directed towards the analysis of professional work organised in occupations and the incorporated competences, the development of occupational profiles and the foundation of educational contents, objectives and structures of vocational education and training with reference to the characteristic work tasks and fields of agency in a particular occupation.

Technological, organisational and economical developments call for an extended concept of qualifications, emphasising the ability to reflect and to participate in shaping the conditions of work as well as one's vocational career. This includes the incorporation of key qualifications and work process knowledge, but can also demand for a redefinition of the concept of occupation itself. These new approaches are also adopted in countries with a more traditional VET system, like China or Korea, to adapt to new demands (Zhao et al. 2011).

7.2.2 From Activities to Competences

Vocational education always needs some form of analysis of incorporated competences, occupational profiles as foundation of educational contents and objectives with reference to the characteristic work tasks and fields of agency in a particular occupation. The central problem of sociological qualification research as it emerged in the 1970s and 1980s as a research area in the sociology of industry and in the 'work and technology' research is the fact that its research findings could contribute to occupation and curriculum development only to a limited extent (Rauner 2009). The analytical quality of sociological research led to a broad, politically oriented discussion on the relationship between rationalisation and the level of qualification requirements imposed on skilled workers. The ethnomethodological 'Studies of Work' developed by Garfinkel attempted to decode the knowledge incorporated in practical professional work. This way a fundamental question was posed for qualification research that the methods of empirical social research were unable to answer (Rauner 2009). A similar situation can be found in expertise research, which can demonstrate the fundamental importance of domain-specific knowledge for the transfer of professional action competences, but which has no methods at its disposal to establish a domain-specific qualification research.

Newer forms of qualification analysis have to be informed by research into expertise development, showing the need for integration and transformation of scientific knowledge into practical knowledge (Rauner 2009). That implies taking into account qualitative changes as well as specific attention for ways to organise and support integration and connections of learning experiences. Curriculum research can no longer be seen as a straightforward translation of occupational practise in educational content. Expertise research, showing the fundamental importance of domain-specific knowledge for the transfer of professional action competences should be related to domain-specific qualification and curriculum research. The international dissemination of the results and methods of qualification research has been made difficult by highly divergent systems of vocational education and training, but can now profit from the growing involvement of vocational education and training in processes of internationalisation. The chances for a dissemination of results and methods in qualification research have become larger. On the other hand, so have the challenges. Analysis has to take into account that employment is divided both horizontally ('families' of occupations) and vertically (in a job hierarchy). New production regimes and broader changes in the economy, influence both demarcations and hence cross traditional barriers between jobs and even economic sectors. In many ways, vocations have either disappeared, or are subject to deep changes with respect to object, methods and social standing.

The international dissemination of the results and methods of qualification research is impeded by a TVET landscape that is shaped by highly divergent systems of vocational education and training. In this respect vocational education is fundamentally different from higher or university education, which is largely represented by international scientific communities. However, since vocational

education and training has by now started to be involved in processes of internationalisation, the chances for a dissemination of results and methods in qualification research have considerably improved (Rauner 2009).

7.3 Competence and Expertise Research

An important reference point for international debates is a common understanding of new insights with regard to competence and expertise research. In the twenty-first century, those entering the labour market need immediate job skills, but they also need a range of career and cognitive competences that will enable them to handle changing jobs and career contexts and to sustain their learning capacity (Onstenk and Brown 2002; OECD 2010).

Röben (2009) discusses the enormous variation in definitions of competence found in the scientific as well as TVET-oriented literature (Onstenk and Brown 2002). The debate on competences is enriched by analysing the already mentioned literature on expertise development. In comparison to a novice, an expert is characterised by a specific quality of his or her knowledge (Benner 1984; Billett 2001).

Very different disciplines and theoretical concepts are used as bases for defining terms such as skills, vocational knowledge, competence or expertise. It should be emphasised that competence does not denote a simple set of skills, knowledge and attitudes connected to specific tasks or circumstances, but should be seen as the capacity of an individual to act effectively in a specific occupational field. Specific attention should be given to the question of knowledge (Young 2007). A quite common method of defining the contents of vocational education and training is a simple and straightforward transformation of codified discipline-specific knowledge generated by the sciences into teaching and learning contents for vocational training. This concept of 'applications' leads to a view of professional knowledge as a hierarchy in which 'general principles' occupy the highest level and 'concrete problem solving' the lowest (Schön 1983). As this method is very common it shall be discussed here although it does not, strictly speaking, belong to the methods of qualification research.

The basic assumption of this research approach is the thesis that social knowledge is generated by the sciences, and that it is available via their textbooks for all types of education and training. However, knowledge is differentiated (Young 2007). A vocational curriculum always has (or should have) dual purposes: providing access to the disciplinary knowledge that has transformed work and acquiring job-specific skills and knowledge. The former purpose relies on context-independent knowledge, whereas the latter will be context-specific, or related to specific workplaces.

The key curriculum and pedagogic issues can be expressed as 'double' or 'dual re-contextualization' (Young 2007). This term refers to two processes. One is the professional or vocational re-contextualisation of disciplinary knowledge for

occupationally specific purposes; examples are physics for physiotherapy or for engineering and is undertaken by the respective professions involved. The second process is the pedagogic re-contextualisation of professional knowledge for pedagogic purposes. This refers to the sequencing and pacing of professional knowledge for different groups and levels of learners and enabling them to integrate this knowledge in the context of specific workplaces; an example is the different curricula appropriate for nursing assistants and graduate nurses. Both these processes are deeply under researched in comparison to the parallel process of recontextualising disciplinary knowledge for pedagogic purposes within the general or academic curriculum (Young 2007).

Practical knowledge as it appears everywhere in professional work is interpreted in this perspective as being applied scientific knowledge. The knowledge-based approach recognises the crucial role of science in a vocational curriculum geared to the new science-based industries but often fails to consider how this new knowledge could be re-contextualised in the workplace (Rauner 2009; Young 2007; Billett 2001). The detailed task analysis or the UK standards-based approach tries to relate vocational knowledge to workplace practise by claiming to be able to derive it from outcomes-based analyses of different occupational roles. However, this not only failed to lead to a practical methodology; it neglected the extent to which only some of the knowledge relevant to particular workplaces has its origins beyond those workplaces (Young 2007). The TVET challenge is making connections between the codified knowledge of the college-based curriculum and the tacit and often uncodifiable knowledge that is acquired in workplaces that is the basis for what is distinctive about vocational knowledge.

This widespread common sense theory that has always shaped the attitude and conduct of TVET teachers and TVET planners has engendered manifold methods and rules which seek to transform theoretical knowledge into the language of users in the domains of work, to exemplify it with reference to specific contexts, and above all to transfer this knowledge by means of inductive learning methods such as action-oriented learning. ‘Pure mathematics’ thus becomes, in the world of vocational education and training, disciplinary and occupation-specific ‘applied’ or ‘professional’ mathematics. Technical matters in the vocational domains of construction, mechanical engineering, computer science and electrical engineering are interpreted and presented as applied sciences. The fact that technology springs from an inextricable relationship between what is socially desirable and what is technically possible so that technology is essentially a reification of societal ends escapes from attention in this perspective (Rauner 2009).

Distinctions have to be made between types of theoretical knowledge and types of everyday knowledge as well as the problems of bridging the gap between them through the process of re-contextualization. By treating all knowledge as potentially explicit and vertical, the standards-based approach fails to recognise the fundamental differences between theoretical and everyday or workplace knowledge. As a result, vocational programmes that rely on the standards-based approach deny learners access to the rules governing the production of knowledge by the scientific and professional communities. Greater clarity about what

knowledge is to be acquired by students on vocational programmes is crucial to wider debates about more effective vocational education and any possibilities of a move towards parity of esteem with general education.

In this respect, fundamental importance is attributed to the novice–expert paradigm (Dreyfus and Dreyfus 1986). This can be used to develop quite another procedure for the identification of paradigmatic work situations for vocational training (Benner 1984; Brown and Onstenk 2002).

Competence is complex and can only be revealed with relatively great effort. Mansfield and Mitchell (1996) distinguish four dimensions: task, task management, contingency management and dealing with the work environment. The last two dimensions are also covered under the concept of work process knowledge. Competence to act can be seen as the willingness and ability of the individual to act in an appropriately thought-out as well as individually and socially responsible manner in a range of specific occupational, social and private situations. Giving more emphasis on responsible problem solving competences rather than routine skills is not only characteristic for western countries, but is also seen in Chinese and other developing economies (Zhao et al. 2011), marking a decisive step in the change from a low-skill to a high-skill economy.

Competence is a multidimensional concept, including specific vocational knowledge and skills as well as work-process knowledge (Boreham et al. 2002). For example, in the Netherlands a concept of core competencies was introduced in defining qualifications as 'an individual's abilities to tackle occupational core problems in an adequate way'. Each qualification should encompass four subtypes of competencies:

- Professional/ craftsmanship and methodical competencies;
- Managerial/ organisational and strategic competencies;
- Social-communicative and normative-cultural competencies;
- Learning and shaping competencies (Onstenk and Brown 2002).

All subtypes include combinations of knowledge (theoretical as well as practical or tacit), skill, attitudes and even personality traits. Multidimensionality is characteristic for the competence concept, as compared to concepts like skill or ability.

In order to enable the VET system to deliver qualified students with these competencies, not only traditional qualifications should change (i.e. pay more attention to broad occupational fields than to specific occupations, cf. Rauner and Bremer 2001), but also the curricula preparing students to meet qualifications. In adopting the concept of competence-based education, VET should prepare its students to become a complete 'professional', not only mastering the skill side of an occupation, but also familiarity with the social-dynamic and cultural aspects of an occupation. From this viewpoint, the responsibility of VET is to guide its students in developing an occupational identity. Identity learning should be the essence of competence-based VET. That implies a focus on the internalisation of the 'habitus' of occupational practise, that is, the ever-changing configuration of

interpretations individuals attach to themselves, as related to the activities they participate in Geijsel and Meijers (2005).

7.4 Learning Places

The complexity of competence development as well as the close relationship to developing vocational practise necessitates the integration of different dimensions of vocational knowledge: codified and theoretical as well as tacit and practical (Young 2007).

Going from content to delivery, an important defining characteristic of vocational education in almost all countries is the existence of different learning places contributing to vocational development. Sometimes these are part of the same system (as in dual systems), sometimes they are sequential steps, as a process of more or less organised inclusion (practical, work-based learning) after a school-based trajectory of theoretical learning. This makes the connection of learning experiences in different learning places a crucial aspect in TVET planning and development (Guile and Griffiths 2001, 2003; Rauner and Smith 2010). Research on connections between different learning sites, processes and results is therefore an important aspect of VET planning and development. This implies cooperation between learning venues: collaboration of teaching and training staff at learning venues involved in vocational education and training in technological, organisational and educational terms (Walden 2009) The ongoing trend towards a pluralisation of vocational training is shifting the balance between individual learning venues.

In some countries, the importance of independent vocational school-based systems is strengthened (Walden 2009). This is likely to tend to increase further the significance of issues of cooperation for good training. Vocational education and training research needs to observe these developments and evolve solutions for any problems which arise. In countries without a formal apprenticeship tradition, on the other hand, this could include an opening up of public TVET institutions to the informal sector of small artisan micro-enterprises, which if done with care, is likely to produce positive indirect effects on initial training. Originally modelled on the school system, TVE has often not taken into account traditional apprenticeship—in spite of the importance of this sector for the economy, as well as for employment—and the need to improve it (Atchoarena and Delluc 2001). This underlines the importance of the development of regional TVET networks of schools, training authorities and small as well as large enterprises. Especially interesting is the development of training alliances between individual companies and schools (Walden 2009).

Walden (2009) sees cooperation as an overarching topic and relevant to a wide range of issues relating to vocational training. He identifies, based on the German discussion, a range of thematic aspects which have wider relevance for other countries. A first one has to do with basic theoretical principles of cooperation.

The necessity of cooperation between learning venues, the tasks assigned to the process and the extent, content and form of the cooperation are identified within the scope of vocational education and training research. There is, however, no comprehensive and consistent theory relating to cooperation between learning venues.

A second theme is research into cooperation in practise. Vocational education and training research carries out studies into the existing range of cooperation between learning venues, analyses the relevant factors influencing this cooperation and considers the issue of the effects of these cooperative activities on vocational training. This research focuses equally on identifying the differences between various areas of vocational training, determining the significance of varying initial conditions and approaches and the individual analysis of selected fields of vocational training.

A third theme deals with the extension of cooperation. Normative ideas and practical findings emerging from cooperation projects, or deficits identified in the course of the latter, form the investigative basis of possible extension and improvement of cooperation. This process also includes the development of concrete proposals for the creation of appropriate terms of reference for an improved level of cooperation in practise.

A fourth theme is the development of practise-related models. Vocational education and training research ultimately develops practise-related models to produce a good level of cooperation. This process involves the consideration of the specific conditions prevailing within the various areas of vocational training.

New combinations of learning venues which are developed (such as between specialised vocational schools and companies) should become a greater focus of research. This process needs to involve close dialogue with vocational education and training practise and policymakers. Alongside such specific research into cooperation, a further task will be the integration of cooperative aspects into the treatment of various research issues within vocational training. Cooperation is an overarching topic and relevant to a wide range of issues relating to vocational training.

Cooperation and connection between learning sites has to include mutual references between theoretical and practical knowledge acquisition, construction and development, without reducing or subjecting one learning process to the other. This implies practical collaboration of teaching and training staff at different learning venues involved in vocational education and training in technological, organisational and educational terms. Research into cooperation between learning venues frequently focuses on the relationships between quite specific places of learning, such as companies and vocational schools or vocational schools and inter-company training centres. Alongside the analysis of the forms of cooperation practised, considerable significance should be attached to the development of approaches for extending cooperation and of suitable practise-related cooperation models. There is a growing amount of research on improving the quality in terms of content and guidance of work-based learning, as well as strengthening connections between school and work-based learning.

In most countries, vocational training systems are becoming more important as well as more mixed (Brown et al. 2000). Traditional barriers between vocational and general or academic education erode, sometimes by making general education more vocational (as for example, in very different ways, in England or France), sometimes by making vocational education more general (as for example, in the Netherlands). In countries with a traditional strong dual system there is a strengthening of independent specialised vocational school-based systems, creating competition for the apprenticeship system of training. In countries with a traditional strong school system, new forms of apprenticeship are promoted. This implies an even bigger need for cooperation in order to deliver theoretically sound and practically relevant training. New combinations of learning venues (such as between specialised vocational schools and companies) should become a greater focus of research.

In the field of cooperation between learning venues, the aim of bringing about improvement in practise is also very closely linked to measures taken by those responsible for vocational education and training policy. This means that, as far as further extension of cooperative approaches in vocational training is concerned, there are fewer deficiencies in terms of academic findings than there are in relation to implementation (Walden 2009). Without suitable initiatives on the part of those bodies responsible for vocational education and training policy, it is not likely that there will be any clear progress in the area of cooperation, at least not in broad-based terms. The extent to which cooperation between learning venues and raining partnerships continue to form the subject of vocational education and training research (as they must) depends, therefore, on future developments in vocational training policy (Walden 2009).

7.5 VET Teachers and Trainers

The variety of vocational curricula, demands on expertise development as well as work-process knowledge make professional development of VET teachers and trainers an essential problem in VET planning and development. The key element in good vocational education is good teachers. As the current workforce ages, many countries are facing a shortage of teachers and trainers in VET institutions. Some teachers and trainers also lack recent workplace experience. Flexible pathways of recruitment should be encouraged and designed to facilitate the entry of those with industry skills into the workforce of VET institutions (OECD 2010).

Growing demands on quality and quantity of VET in most countries make research into expected competencies and training of VET teachers a hot issue. In many countries in Europe or elsewhere, TVET reform has meant that many professional educators do not (or no longer) have the official required qualifications (Cort et al. 2004). Professional development of VET teachers is lagging behind (Attwell and Brown 1999). While focussing on the German situation with its distinction between vocational teachers in vocational schools and trainers in

companies, Bauer and Grollmann (2006) analyse some important issues of broader relevance. The need for professional development is augmented by the growing diversification in vocational students (i.e. immigrants) as well as declared European policy objectives (Lisbon 2000 and beyond) aiming for rising enrolment in higher education, which put higher demands on professional and academic accomplishments in VET. There are a great number of deficits and problems with regard to vocational teacher training and professional development. Themes with respect to the relationship between vocational and pedagogical knowledge and expertise are relevant in all countries. New insights into learning and expertise development require a more sophisticated and varied repertoire in didactic and pedagogical methods, tools and practises. Vocational teachers are either trained and experienced professionals in their vocation or trained in general subjects such as mathematics, language or history. In the first case, especially in vocational schools, becoming a teacher implies the risk of not remaining up to date with respect to technological, methodical or organisational changes in vocational practise. In the second case, they often have no familiarity with the vocation, and so have difficulty in connecting general subjects to vocational issues.

Coming from a professional background, many vocational teachers and trainers lack proper pedagogical and didactical training, but even if they get any, questions can be raised with regard to quality and effectiveness. In most countries there is no tradition of vocational pedagogies. And if there is, actual training practises vary considerably in taking into account new insights into learning theory (i.e. cognitive, constructivist and situated approaches). The need for combining research into new didactic and pedagogical designs with research into professional development of teacher and trainers should be stressed (Onstenk and Brown 2002).

7.6 VET and Organisational Development

Research on VET planning and development has a double relationship with the economy and labour market. On one level it has to deal with demands with respect to competences and qualifications of the labour force. On another level it contributes to economic and organisation development by identifying specific sets of expertise and by developing learning and shaping competences. The existence of an elaborated system of high quality (and high level) vocational education is important in striving for an innovative high skills economy (Brown et al. 2000). Dybowski and Dietzen (2009) deal with this relationship by analysing innovative and dynamic VET as a strategic resource for innovation, both on the level of the economy as a whole and on the level of companies. This discussion is going on in all countries, with or without an established VET system. The chapter gives some lessons from Germany with regard to the role of the so-called vocational principle (Beruflichkeit), which traditionally characterised VET. Reported research findings confirm the hypothesis that ‘new professionalism’ (neue Fachlichkeit) is emerging (Onstenk and Brown 2002). As work-based learning is an important,

necessary—and in most countries— a growing part of VET (Raizen 1994), an enduring system of competence development can only be achieved if there are accompanying changes in organisational structures: development of appropriate structures for cooperation and communication in companies, strategic alignment of management personnel, creation of clear recognition and reward structures and promotion and development of working environments that foster learning (Nyhan 2002). On the other hand, competence development can be seen as a basic prerequisite of any technological, methodical or organisational innovation in the company, as it ensures that the workforce is equipped with the necessary capabilities to support such a transformation. As individuals, workers will need more work process knowledge and reflective abilities like 'organisational awareness', 'participation in processes of change' and the ability to 'define their own role'. They need this to negotiate the compatibility of their personal interests and career development with their occupational practise and the interests of the company.

The conclusion that elements of occupation-specific, process and social competence should increasingly be treated as an integrated whole is important for all countries. The analysis of content and relative importance of different components of occupational competence within the framework of existing and emerging occupational profiles is an important challenge for research in the area of VET planning and development. Mutual relationships between VET, skills development and organisational development should be centre stage in this research. This implies cooperation and communication between different and in many respect separated fields of research, i.e. management, learning organisation and organisational development, qualification research, expertise and competence development research and career research.

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