PATTERNS OF INTER-INSTITUTIONAL AND INTER-ORGANIZATIONAL COLLABORATION STRENGTHENING THE RELATIONSHIP BETWEEN VET AND LABOUR MARKET FOR DEVELOPING A PROFESSIONAL WORK FORCE

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Abstract

The relationship between Vocational Education and Training (VET) and the labor market is crucial for developing a professional work force. The paper investigates relational patterns of inter-institutional and inter-organizational type. Such collaboration is a strength of the German vocational education system but is recently challenged by both demographic and technological trends. After a more theoretical introduction of the European Framework for Education, the author discusses two specific approaches to highlight recent developments in a conceptual way, using a case study design. Case study I deals with a TVET-Stakeholder online community and Case study II with an apprenticeship-trainer online platform.

Subsequently both case studies are used to address challenges and related approaches for structural developments of the VET in Germany and beyond, discussing what it means to develop such linkage further in the age of the knowledge society and web 2.0, virtual enterprises and online education. The recent trend of introducing web2.0 technologies in vocational education as well as in the industry itself opens quite new opportunities for strengthening collaboration between VET and the labor market. This is especially necessary because in 2014 for the first time in Germany the number of those starting academic training has exceeded the number of those entering vocational education.

All in all patterns of inter-institutional and inter-organizational collaboration receive additional importance in TVET. Only recent developments concerning both, new organizational principles and new media technologies, allow the development of better solutions for the near future.

Keywords: Vocational Education and Training, Knowledge Society, Web 2.0, Online Education, Inter-institutional Collaboration, Virtual Organization, Case Study, European / German Qualification Framework

1. Introduction

Inter-institutional and inter-organizational collaboration are serious strength of the German vocational education system. Concerning the organization of the vocational and technical education a core component of the TVET is the strong inter-organizational, even inter-sectorial linkage between vocational institutions and industry. The principle of the German model is to interlink training components coming from both sides, VET and Industry. Whereas in some other European states more than 50% of the workforce received a mainly academic training, taking place at a colleges and universities, in Germany the majority of the workforce is trained within the VET programmers. Due to the core role of the two key players, VET and Industry, this approach is labelled as the “Dual System”.

What does it mean to develop this linkage further in the age of the knowledge society and web 2.0, virtual enterprises and online education? The recent trend of introducing web2.0 technologies in vocational education as well as in the industry itself opens quite new opportunities for strengthening collaboration between VET and the labor market. This is especially necessary because

in 2014 for the first time in Germany the number of those starting academic training has exceeded the number of those entering vocational education. Overall these and further influences do currently lead to a renewed attention given to the VET in Germany. The paper will discuss approaches to highlight recent developments conceptually. Subsequently the author uses case studies to address both, challenges and related approaches for structural developments of the VET in Germany.

Theoretical background is the European Framework for Education, an 8-step-scale that defines how to interlink the different levels of any education provided in Europe. Indeed the German national VET scheme sometimes did not plan continuing education, when a learner has reached the highest vocational level and the transfer to other educational routes would not be allowed. It has only partlybeen discussed what positive consequences such a unified qualification scheme does have for the collaboration in general (Lave & Wenger, 1991; O-Reilly, 2005, Mohamed &Köhler, 2011) and the Dual System in VET and how the German educational sector tries to keep up, perhaps even advances by adopting it.

Case study I (TVET Stakeholder online community) addresses the challenge that different regulations need to be applied to determine the targets and contents of the VET. All in all industry, TVET sector, unions, policy etc. need to define the needs and goals of any new TVET program jointly. Therefore, the author introduces a research project of Dresden University of Technology, one of Germanys leading academic institutions in the TVET sector, which aims to promote social interaction between all before mentioned stakeholders. This is not so much a didactic approach of learner-teacher-exchange but moreover a collaborative endeavor to encourage the building of vocational stakeholder-communities online, including practitioners who are located at different places but need to exchange knowledge and information.

Case study II (Apprenticeship-trainer online platform) shows an already successfully implemented socio-technical solution. It deals with need of an improved collaboration of VET and industry within the training process. Here the duality leads to specific challenges because one institution does not deliver education only. To overcome such limitation that the measure aims to promote social interaction between learners and teachers in VET. Specifically we encourage the building of vocational online-communities of learners and teachers in vocational education but also of vocational trainers located in the training enterprises.

2. Theoretical background: re-framing education in Europe with the help of inter-institutional and inter-organizational patterns

How can we combine different sectors of education within a single pattern? Europe is demonstrating that for a re-framing we need to allow combining different layers of education, including TVET, within one system. Such provides as well new linkages of inter-institutional and inter-organizational educational collaboration (Köhler, 2006; 2012).

The European Qualifications Framework for Lifelong Learning (EQF) is a relatively new eight-step scale that defines how to interlink the different levels of any education provided in Europe. The EQF, which is intended to act as a vehicle for linking the various national qualifications system via so-called National Qualifications Framework in order to create greater understanding of national qualifications at a European level profiles (cf. EUROPEAN COMMISSION, 2008). Following the recommendation of the European Parliament and European Council of 23 April 2008 on its establishment the European Qualifications Framework for lifelong learning should be linked to the national system of qualifications until 2010. However, the new scheme does not directly fit the German legal situation as defined by the Vocational Training Act (cp. Federal Ministry for Education and Research, 2005).

Overall, the European Qualifications Framework for lifelong learning delivers “a common reference framework which assists in comparing the national qualifications

systems, frameworks and their levels. It serves as a translation device to make qualifications more readable and understandable across different countries and systems in Europe, and thus promote lifelong and life-wide learning, and the mobility of European citizens whether for studying or working abroad." (cf. http://ec.europa.eu/eqf/home_en.htm)

To implement this new European specification in Germany it has been agreed to develop a national qualifications framework, the DQR [English term: GQF fir German Qualification Framework]. Following the adoption of the DQR (see DQR Working Group, 2011) in the group, DQR also been afforded an opportunity to begin the mapping of national qualifications levels to the DQR. As described by Esser (2012) already during the phase of drafting the DQR drew, a dissent in the positions between the TVET affiliated institutions and the Standing Conference of the Education of the German states (KMK) occurred. In particular, the allocation of professional qualifications and general university entrance qualification could not be resolved, even until now.

The two figures on the next page give further insight into the European Qualifications Framework for Lifelong Learning, separated for its levels 1-4 versus 5-8 (cp. http://ec.europa.eu/eqf/). Each of those eight levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications. The EQR may be applied toward any educational activity independent of its sectorial heritage.

		KNOWLEDGE	SKILLS	COMPETENCE
Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.		In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of EQF, competence is described in terms of responsibility and autonomy.
LEVEL 1	The learning outcomes relevant to Level 1 are	basic general knowledge	basic skills required to carry out simple tasks	work or study under direct supervision in a structured context
LEVEL 2	The learning outcomes relevant to Level 2 are	basic factual knowledge of a field of work or study	basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	work or study under supervision with some autonomy
LEVEL 3	The learning outcomes relevant to Level 3 are	knowledge of facts, principles, processes and general concepts, in a field of work or study	a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	take responsibility for completion of tasks in work or study adapt own behaviour to circumstances in solving problems
LEVEL 4	The learning outcomes relevant to Level 4 are	factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

Figure 1. The European Qualifications Framework for Lifelong Learning, Levels 1-4 (cp. http://ec.europa.eu/eqf/home_en.htm)

LEVEL 5*	The learning outcomes relevant to Level 5 are	comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	exercise management and supervision in contexts of work or study activities where there is unpredictable change review and develop performance of self and others
LEVEL 6**	The learning outcomes relevant to Level 6 are	advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts take responsibility for managing professional development of individuals and groups
LEVEL 7***	The learning outcomes relevant to Level 7 are	highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research critical awareness of knowledge issues in a field and at the interface between different fields	specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
LEVEL 8****	The learning outcomes relevant to Level 8 are	knowledge at the most advanced frontier of a field of work or study and at the interface between fields	the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

Figure 2. The European Qualifications Framework for Lifelong Learning, Levels 5-8 (cp. http://ec.europa.eu/eqf/home_en.htm)

Indeed the subsequent VET leads sometimes to dead ends of education, when the highest vocational level is reached but the transfer to other educational routes would not be allowed. However: "Bridging frameworks depend on the existence of separate sectorial frameworks which are governed by sectorial interests. There is a stronger form of linkage, which gives an NQF the role of bringing together the sectorial frameworks into a new integrating framework. These frameworks are a formal link between different education and training sectors and are represented by a single set of levels and descriptors covering all education and training sectors. Each sector uses this common set of levels and descriptors as its own framework. No separate sector frameworks exist." (Cp. EQF Note 2, 2010, pg. 29)

Type of framework	Characteristics
Sector	A defined series of qualification levels for one or more education and training sectors (general, VET, HE, Adult). Some sector frameworks could have level descriptors There are no explicit NQF links between the sector frameworks for different education or training sectors.
Bridging	There is a set of common qualification levels that cover all education sectors. Some of these common levels can have a set of descriptors. Separate sector frameworks exist as a basis to this bridging framework. The bridging framework forms an formal link between different education or training sectors
Integrating	A single set of levels and descriptors covering all education and training sectors, each sector uses this set of levels and descriptors as its own framework. No separate sector frameworks exist. The integrating framework forms a formal link between different education and training sectors.

Figure 3. Types of Qualification Frameworks (EQF Note 2, 2010, pg. 29)

Subsequently we will apply such a unified qualification scheme for TVET, specifically toward developing the so-called Dual System of TVET that is the specific German vocational education approach (Kersten et al., 2011). As described by Köhler (2012) three specific tasks concerning the implementation of the DQR, i.e. the German Version of the EQF, are pending and have particularly importance for TVET:

1. Allocation of Qualifications: In accordance with the agreement of the federal, state and social partners of January 31st 2012 the already agreed upon by consensus assignments, made especially to level six (e.g. bachelor, college, specialist, master).
2. Development of competence-based order means (measures): The recommendation of the European Parliament and of the European Council in April 2008 provides for the definition and description of qualifications a learning outcome-oriented approach. In that context, the German TVET has a need to define the qualifications of the training in the future in so-called competency-based order means (measures) for all general-education degrees.
3. Designation of a national focal point: According to the recommendation of the European Parliament and of the European Council, a national infrastructure for the implementation of EQF / DQR needs to be developed. Of particular importance, here fore is the creation of a national coordinating body to ensure, in particular the linking of the DQR associated qualifications to the EQF. It shall also ensure that all relevant stakeholders are involved in the implementation process in accordance with national legislation and practice.

3. Case I: TVET Stakeholder online community

Aim of the so-called AOK community project is the modelling and assessment of competencies of academic qualifications in terms of their labor-market effectiveness. The sub-goals of AOK community share these include in the theory-oriented modelling and transfer-oriented validation example:

- Theory-based determination of structural indicators of academic qualifications in terms of European / the German Qualifications Framework EQF / DQR, National Educational Panel NEPS and Bologna study documents (European study book, student card, Diploma Supplement)
- Generic (structural) competence modelling based on online portfolio
- Concept of the involvement of stakeholder groups in the modelling with a particular focus on labor mark close, professional / operational requirements

- Development and testing of a prototypic method in the above Professional community
- High school Cross-validation in the context of “Education portal Saxony”, which is Germany's largest academic learning platform with >100,000 students and covers all the universities of the Free State of Saxony

Objectives of the project AOK community deal with the conceptualization of generic competency models as well as the development and testing of measuring instruments for the assessment of competencies. The here newly developed methodology of the labor market-oriented competence-modelling for academic skills in communities is based on the structural elements of existing models of academic education (study documents in accordance with Bologna, EQF / DGR and the indicators of the National Educational Panel). Linked to these elements we address a portfolio-based online methodology for a profession-independent, structurally oriented approach to competence modelling of academic qualifications.

In particular, the method proposed here is that the operational / professional stakeholder groups will be included in one joint community of labor market-related social partners (chambers, associations, employers, unions, etc.). Such is effective in the definition of competence profiles and will be extended by education scientific research in particular related to the new methodology of the portfolio-based online skills assessment in the dual vocational training (see www.blok-online.org).Here for the first time a completely online-based assessment of individual competencies in TVET has been implemented successfully.

Target group of the project AOK community are students in the bachelor and master phase (Bologna phases I + II). Such are the one hand, extensive structural requirements for the competence modelling, which have already been introduced in practice. On the other hand, this group is numerically very extensive and very relevant. In principle, the method chosen here is also applicable to doctoral students (Bologna Phase III) - however, the doctoral study conditions are relatively heterogeneous in Germany and comparable with the US-system (Köhler et al., 2011). In addition, that target group is possibly rather small and thus an effective transfer and validation would be different.

The aim to use the portfolio as a tool of competence modelling is related to the Personal Development Planning (PDP). The basic approach of PDP, which is originally used to promote executives, may be located in a competence development that helps the developed to orient toward personal development objectives. In contrast, the portfolio work is based on the structured collection of qualification certificates, which acquires the learner in its formation history and the document his current skills profile. In the project AOK community, these two complementary approaches are combined in the context of academic training to a standardized procedure for individualized study and educational planning.

With high probability, the expected benefit within the conceptual context of the Bologna framework, the permanent promotion of ownership and the motivation to study will help the students with the acquisition of relevant work-related skills reduce student dropout rates. We predict a significantly increased labor market relevance of the skills profile of the graduates, as well as in reflexive effect are improved quality and a demand-oriented design of studies and service offerings of the colleges. After the development of conceptual and methodological foundations of the use of portfolio-based development, planning is investigated empirically with students of different professional cultures and forms of higher education in the Free State of Saxony. The aim is to demonstrate the successful applicability of portfolio-based development planning in the academic qualification scientifically. By that, its comprehensive potential benefit for future adoption can be addressed. As a result, the project AOK community will also provide generic planning principles and tools for implementation of portfolio-based

development planning at other German universities. The following figure 4 gives an overview of framing conditions plus the modelling approaches at both the individual and community (i.e. organizational) levels:

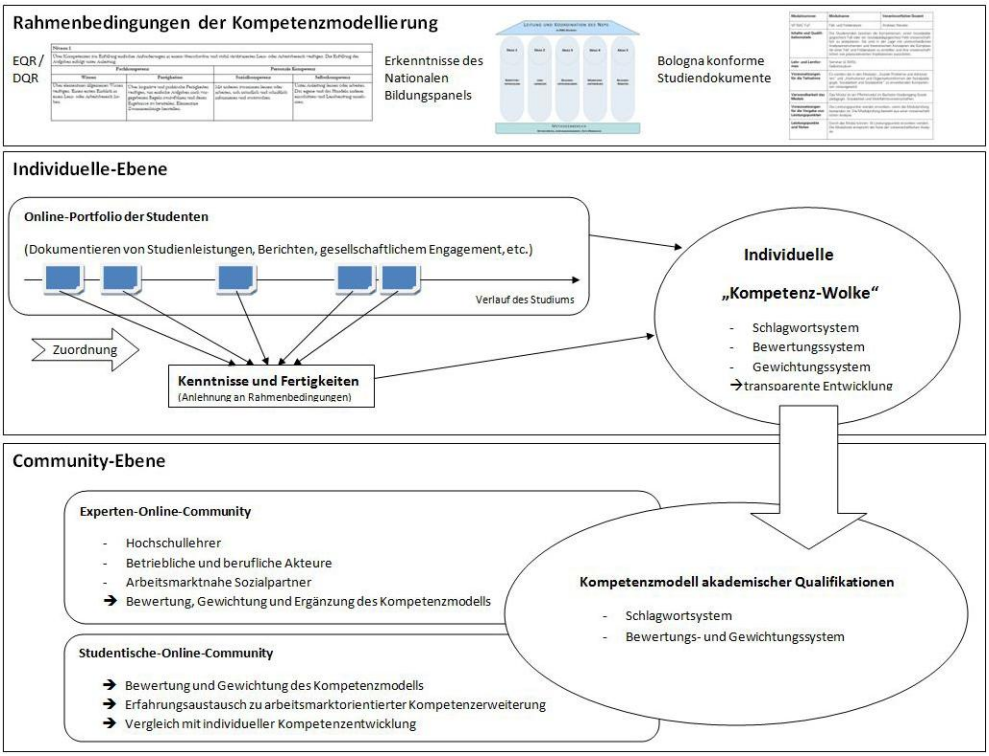

Figure 4. Framework and modeling approaches on an individual and community level

4. Case II: Improving collaboration of VET and Industry in the training process by web 2.0 methods

As described by several authors continuous training is one of the most rapidly growing sectors of education. It has become even stronger under the label of lifelong learning in Europe (cp. Frindte et al., 2001; El-Gamal&Köhler, 2009). Köhler (2012) outlined that vocational education learning contents and as well, as study contents hardly meet the operational specifics of work-related training where rather short periods of training activity are needed. To explore the potential that is given by the application of new online technologies in the field of vocational training we present the online vocational portfolio as an example. This online vocational portfolio is not a direct transfer of the traditional vocational educational and training model into the context of virtual teaching and learning. Moreover, it is a solution to improve the organization and documentation, and the way students deal with the individual reflection of the educational and training process – as shown by the table 2.

The online training certificate was developed within the R&D project „Online record book for strengthening the place of learning cooperation" (cp. http://www.blok-online.org/; Albrecht at al., 2012)and sponsored witha grant from the Federal Ministry for Education and Research within the context of the national program „Web 2.0 in Vocational Education". In the center of the project stands the re-development of an existing instrument used by every German trainee, the paper-based training certificate book, with the help of innovative online communication technology. Primary objective is to strengthen the cooperative learning location between businesses and schools through a unified and common information base. Overall, the online record book links all stakeholders participating in the vocational

education scheme, including students, teachers, vocational trainers and members of the examination committees at the chambers of trade.

The online record book is the digital conversion of paper-based form of the report booklet in a Web 2.0 application that can be used anytime, regardless of current place of learning of the trainee. As usual with the classical form of report specifications, the trainees also document in the web form on a regular basis the temporal and material process of its apprenticeship. The special feature is the virtual representation of the entire process of using the record book. This means that not only the time and location independent performing and reading the report booklet is made possible through the online training certificate, but also the (legally binding) acceptance of the report issue by the instructor and the transfer of the record books contents to the examiners in the respective chambers and guilds.

Figure 5 shows a screenshot of the report book in the weekly issue. Besides the view of a single weekday, there is a possibility to select the form of training and the type of presence (for example, vacation or illness). In addition, the trainee can insert an unlimited amount of additional contents (notes, documents etc.) in his record book, which allows building an extensive but highly individual documentation.

Figure 5. Implementation of the report in the online record of formal qualification

Main goal is the reliable collection and presentation of subject specific competences in the context of the vocational training. The measure of professionally applicable, well-trained competencies is based upon the trainees initially assignment in the record book. Here the entries are linked to so-called qualifications, i.e. vocational training positions from the regulations, which are stored in the system according to the professions temporal and subject related structure. This assignment requires active reflection of the training content edited by the trainees and can thereby strengthen their ability to reflect their own vocational development. Captured by the accumulation in the record book and the professional profiles positions assigned work or study hours in each area, the corresponding actual state is represented as achieved by the trainees. With the target / actual status indicator both the trainees and trainers are able to identify whether the trainee has worked according to training policy / curriculum at the particular time and on the necessary activities to a sufficient extent. Through the resulting transparency, differences may be easily detected and corrected by the student in a mostly self-determined way.

5. Conclusions

The German vocational education system offers a strong basis for a high quality approach to TVET when principally involving both, the schools and the industry. However, the system does also show some weakness in the context of an effective collaboration of both partners. Another demand is linked to the localization of the TVET in the overall education system.

So far, the collaborative portfolio approach received no or little attention in vocational training, so that the potential of the portfolio work for the self-determined design of learning processes remained unused (see Elsholz&Knutzen 2010). The only known cure for the documentation of the training course of trainees is the paper-based record book, which documents the material and temporal course of vocational training, but it often takes only the function of justification and control. Aware of this shortcoming the peculiarity of the presented portfolio approach in direct support of the portfolio-based consists collaborative measurement methods for competencies at the established vocational training record book, which each trainee mustcomplete and which is controlled by the instructor. In this case, the requirements of the training regulations are initially implementedand the tasks completed must be assigned to the competencies and skills listed by the trainees themselves. In this respect, the e-portfolio is optimally adapted to the practice of vocational training, so that an essential aspect outlined by Elsholz&Knutzen (2010) toward e-portfolio work is taken into account.

Following Klampfer&Köhler (2013), the author argues that in order to transfer the potentials toward lifelong learning it appears beneficial to consider success factors of the media-didactic conceptualization of the online vocational training certificate. Here it is necessary to explain the vocational training in Germany that is constructed (as in some other European countries) as a „Dual System" of periods in the vocational schools plus practical periods in the closely connected enterprises. However, both institutional partners have a separated responsibility for the period under their supervision and are often enough invisible for each other. Only recent online technology may become a stable infrastructure for collaborative education and training activity. Therefore, one key success factor is to bridge the time, content, and spatial proximity within the training process through the utilization of the e-portfolio. If one addresses this need within the labor process, it is obvious that a corresponding development portfolio should be placed directly in the working environment.

All in all patterns of inter-institutional and inter-organizational collaboration receive additional importance in TVET at the interface between the education sector and industry. Only recent developments concerning both new organizational principles and new media technologies

allow the development of better solutions for the near future. As well, one may expect a slight renovation of Germanys' dual system that is eventually even triggered by its classical strengths. Moreover, such provides additional opportunities to re-define the role of the trainee as a self-steered and self-reflected learner who becomes more and more an active partner of both, the teacher and the vocational trainer and develops to a knowledge carrier for its professional colleagues. By that, we expect a strengthening of the organizational relationship between TVET and labor market toward developing a professional work force.

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