
Development of Workplace Learning Partnerships in Vocational Education and Training Between VET Schools and Local Companies

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ABSTRAK

Kerjasama aktif antara perusahaan dan sekolah kejuruan dapat memberikan dampak besar terhadap kemajuan belajar peserta magang atau pelatihan. Kesesuaian antara proses belajar yang berbasis sekolah dan tempat kerja ini akan memadukan aspek-aspek praktis dan teoretis dan melahirkan pembelajaran holistik. Proses belajar ini akan meningkatkan kemampuan dan keterampilan siswa kejuruan. Namun demikian, pemahaman baru tentang dimensi pembelajaran kejuruan ini menuntut kerjasama yang jelas di antara para pelaku utama dan juga memerlukan strategi kerjasama yang tepat antara sekolah dan perusahaan. Kedua belah pihak harus lebih siap dalam mengembangkan kerjasama ini. Artikel ini memaparkan berbagai piranti untuk memberdayakan dan mendukung para pelaku utama dalam pendidikan dan pelatihan kejuruan, khususnya pelatih dan guru, dalam mengelola kerjasama dan melaksanakan model kurikulum baru.

Kata Kunci: vocational education and training, workplace learning partnerships, VET schools

In Germany, a reform was introduced in 1996 to centre learning in VET schools around Lernfelder (learning arenas). Learning arenas should follow the work processes, replacing the old idea of school subjects. This curricular model should give the apprentice a more coherent and holistic understanding of what he can learn at practical work and how learning at school can complement this. The apprentice shall get a deeper theoretical and practical insight into his or her professional field and a better understanding of the theory and practice of his vocational discipline. This change of learning and teaching obviously requires the establishment of stronger interaction between work place experiences and systematic, theory based learning at school. Such a reform has many implications beside on curricular changes also on school teaching as well as on the training process within companies were apprentices work. What is learned in the VET school classroom shall get into closer contact with what is learned in practical work situations, or in other words, learning in the classroom shall enable the apprentice to take a much closer relationship to his company's real

work tasks and business processes. Learning for and by problem solving of technical cases instead of just following text books is part of this new understanding [Conference of the educational ministries 1999].

Not just co-existence but active collaboration between schools and companies is needed. First of all the schools have to activate their co-operation with the industrial trainers and instructors by creating cross-institutional working groups. In these teams both partners must identify the 'integral work and learning tasks' in the occupational profile.

Still, the existing collaboration often is too weak. VET-related dialogue between schools and companies is rather scarce and is minimised towards formal information, e.g. like the case that the apprentice was not present at VET school. Therefore, there is a need for supporting the cooperation development between trainers and teachers, in particular to promote new methods of teaching and learning at the companies as well as in the schools [Sloane 2004]. Some of the critical questions which are debated often times:

- How can trainers and teachers develop working and learning tasks more cooperatively?
- How can work and learning task be based on real work assignments?
- On which criteria can key work and learning task within occupational profiles be selected?
- How can in-company training even under scarce resources (less full time trainers) be enhanced?
- How can such integrative teaching and learning processes be evaluated?

The paper will present well proven and evaluated tools for the development of in company training routes and trainer support systems as well as a conceptual instrument how to evaluate cooperation partnerships between schools and companies [Timmermann 2005] [Deitmer and Gerds 2002] [Deitmer and Heinemann 2009] [Deitmer and Ruth 2007]. These tools were considered as helpful to improve the quality of cooperation between schools and the work place. By an increase of quality the cooperation of the learning venues is to be improved and goes beyond knowing each other. It understands itself in coming into a practise of mutual projects and curriculum work. The development tools presented are different, namely an in company **career road map, work and learning tasks (WLT)**, a tool for the **evaluation of work and learning tasks (SEVALAG)**, and a tool for the evaluation of cooperation issues and the kind of quality reached so far in the cooperation practise. The presented concepts derived from several German and international pilot projects and research studies. Some of them have been implemented during a bilateral teacher training development project in Beijing and from a PhD project in Malaysia [Ramli 2010] [Deitmer and Ramli 2008] [Deitmer, Burchert and XU 2010]. In the first part of the paper we will describe company based training tools and than come to supportive tools which are important for the development of the cooperation between learning venues.

Tools to support in company based training development

Before I come to describe the development tools I will describe the actual situation of company-based training. Because of several reasons, like cost reduction; lack of skilled trainers, more liberate

regulation there is a trend towards integrating apprentices as early as possible into the 'real' work process and allow them to share work within the production process. For example, the Bremen Steelworks company (has 250 apprentices) has experienced a 30% cutback of their budget for full-time trainers although the number of apprentices has remained stable. This gives the apprentices a challenge to learn more in real working contexts and real work-based assignments at different production units. Therefore, the numbers of part-time trainers has been increased in the training process. However, some part-time trainers lack some of the necessary training, in particular skills in promoting the self-organised learning processes of the apprentices. A strategy to deal with such changes is to set up an in-company learning infrastructure with three major steps:

- (1) Launch of work process learning route (road map) by central work and learning tasks (WLT) with remain of high learning potential and of key value for the professional occupation to be achieved by the apprentice;
- (2) Optimal programmes and support actions within the company to guide and coach the apprentices.
- (3) Formative evaluation of the developments and by producing feedback and this to allow continuous improvements within the training company.

All stages are supported by specific development tools for the colleagues involved into training; either full time or part time.

What kinds of skills are required for the training process? First one can mention training skills, which consist in the ability to enable and encourage learning for learners in a work environment, and to enhance their knowledge and skill development process by professional work and learning tasks. The second type of training support are coaching and career guidance skills in which the trainer or colleagues (part time) assists the learning of the youngster or trainee in order to accompany and help through difficulties in the work organisation and in order to support the learning process. These training support skills at the side of the trainers are related to supporting the individual learning progress of the apprentice. In addition, the trainers need skills for guiding the apprentices with the reference to *learning paths* based on an *in-company training plan* or a *pedagogic road map*.

Finally, the trainers need to be able to empower the learners by supporting self-organisation, personal responsibility and reflective self-evaluation.

As mentioned before, the internal learning network is based on specific tools, which can be regarded as cornerstones in the VET student development process. They include a **self-assessment of competences**, that is, an assessment of **VET students' prior learning experiences**, an in-company training plan based on **key work and learning tasks (WLT)**, a career road map for students, which covers personal wishes (student perspective) and organisational requirements (business perspective) in order to synthesise them in an in-house students' development programme, and formative evaluation and empowerment tools like Mentoring Evaluation Tool or the SEVALAG tool.

The **in company training road map** is a kind of organisation tool that which helps the student to find his or her way through the company. This should help what can be learned at what working places and give the student the advice to develop their competence with the advancement of their training. One part of this kind of road map is the competence assessment sheet, which allows student to access what he has learned so far and what is still missing within the competence profile of the occupation he is learning for in this company. On one side of the table the competences needed are shown while on the other side we find a description of where the student is so far [Deitmer and Ruth 2007].

The second tool is the identification, preparation and assessment of apprentice work and learning tasks (WLT). These are based on a combination of work tasks and learning processes [Reinhold et.al. 2002]. The learning opportunities for novices in a company are shaped by the work flow in which the business processes are linked. Work and learning tasks are core vocational tasks to be learned by a student for as specific occupational profile or job description. The potential benefits of WLTs can be described as follows. First, by learning through meaningful tasks at the workplace the students are better motivated. Second, by mastering certain new work activities the abilities of the students are enhanced.

The question is: How can these work and learning tasks be identified and prepared from the perspective of a trainer? This takes place in a process with three steps, which can be described as identification, verification and implementation. The

criteria to be applied by trainers for the identification of work and learning tasks are the following:

- Kind of task
- Business plan, company mission; corporate work tasks
- Examples of typical key work and business processes
- Work processes and typical work methods to be applied
- Requirements for employees
- Applied equipment
- Focal points during work tasks and work processes.

First company training case: experiences from design, implementation and evaluation of work and learning task

Our first company training example is Arcelor Mittal Bremen GmbH, an integrated steel mill in Bremen. Their business covers flat steel production from furnace to tailored blanks. In 2007 the company employed approximately 3,500 workers and generated a turnover of more than 1.3 billion Euros. In 2006, 3.6 million tons of steel were produced. The work and learning task implemented in this company consisted of working out a safety enhancement for a metal cutter. The safety problem that had been identified was the risk of having parts of the hand cut off when the machine was working. Accordingly the task to be solved was to work out a solution for stopping the machine automatically when somebody was entering a predefined safety zone. The task of the VET students was to develop a technical solution for this problem. The students had to develop and test ideas and to consult experts. They were working in teams of three to four students, had to exercise a cost benefit calculation, draft a realisation plan and present their results. When a work and learning task is carried out, trainers need to find out whether the task is actually helpful for students, has the potential for courses and can be verified. For this evaluation the SEVALAG tool is available. SEVALAG is a self-evaluation tool for teams of teachers and trainers. By means of this tool the usability of the work and learning task for the VET students and the qualification process as well as the potential and the realisation of the learning task for the VET school can be evaluated. The results can be used for the improvement of the learning task and the design of future learning tasks.

The **SEVALAG tool** is composed of four main criteria, which are each broken down into several sub-criteria. The first main criterion, "Learning potential of the WLT", is composed of the sub-criteria

- Development of professional knowledge,
- Development of adequate working methods,
- Balance between pedagogical freedom and guidance, and
- Addressing general and educational goals.

The second main criterion, "Competences addressed by the WLT", consists of the sub-criteria

- Professional competences,
- Adequate working methods,
- Working independently, and
- General educational goals.

The third criterion, "Shaping potential of the WLT", consists of the sub-criteria

- Typical of vocational tasks,
- Work and business process orientation,
- Addressing shaping skills, and
- Deepening co-operation between vocational school and enterprise.

The fourth criterion, "Shaping competences of the WLT", is composed of the sub-criteria

- Developing professional self-awareness,
- Enabling development from novice to expert,
- Learning to shape work and technology, and
- Relating theoretical and practical knowledge.

Second company training case: experiences from applying an revised apprentice training route

Our second case example is Schierholz GmbH in Bremen, a medium-sized manufacturing company in the automotive supply sector. The company offers initial vocational education and training for occupations like mechanic and mechatronic. There are 12 apprentices, including four women. The in-house training centre was closed when the trainers went on retirement, and only one part-time trainer is now responsible for the training process.

The starting situation was thus quite problematic. There was no clear learning plan for VET students, the students themselves hardly overlooked the company's business flow and order processing structure, and the training outcomes in terms of the marks achieved in the final examinations were relatively weak. The answer to this problem was a combination of technical training and mentoring by decentral learning at the workplaces throughout the company and on the basis of the road map.

A new learning infrastructure was set up for the students based on the linkage of business processes, work processes and learning opportunities. An in-company training plan was developed in two steps. First, a workplace analysis was carried out in each department of the company. The trainer asked the employees about their work tasks with the help of a checklist and verified those work tasks that were suitable for the students and their learning potential. The second step consisted in interviews with the students concerning their experiences in the workplaces. As a result, a road map for work-based learning at different workplaces was drawn up. According to this road map, the student follows the work process through the company.

Evaluation of the quality of cooperation between schools and regional companies by ERC tool

Innovative partnerships between VET school and industrial actors require techniques and tools that assist them in improving their co-operation agenda and help to manage the partnership. What is needed is a method which enables the partners to self-evaluate and exchange their perceptions about the common goals, their perceptions, the partnership structure and the communication and learning processes. This type of discursive and participative evaluation can help the actors to gradually develop a clearer strategy to set up the right objectives and action plans for the partnerships.

ERC tool stays for the **evaluation** of the **regional cooperation** of VET school and the training enterprises and contributes both to the evaluation and improvement of learning partnerships. The tool grew from experiences while undertaking assessments in regional and national R&D programmes [Manske et. al. 2002]. The most important design element of the EE Tool is a criteria-based questionnaire. The criteria were selected on the basis of innovation theory research literature [Deitmer, Heinemann, et.al., 2003, p. 137-170] and deal with the following five topics: goals, resources,

project management, partnership development and communication/learning. These criteria are briefly expanded on below.

Goals (1)

The goals of a network may not be completely defined at the beginning stage of the partnership, but a good mutual understanding of and agreement on goals is crucial for the success of the co-operation. The 'goals' criterion looks at both the goals of the network as a whole and at the level of individual partners.

Resources (2)

This criterion looks at the different types of resources that should be available to a partnership between schools and enterprises. It examines whether the financial and physical resources as well as the level of professional recourses are sufficient. Often times resources are short but in many cases by partnering resource deficits can be compensated.

Project management (3)

This criterion examines the process of managing the cooperation partnership and is broken down into three sub-criteria: clear allocation of tasks, fair distribution of work and clear rules and procedures.

Partnership development (4)

This criterion groups the following three sub-criteria: the development of trust; the social competences of partners; and their organisational or decision making competences. Trust is a precondition for cooperation. Social competences such as the ability to function as part of a team are also important. Persons involved in a PPP should have sufficient standing within their organisations, e.g. school or company so that decisions made by the learning partnership can have the maximum level of impact within their organisations.

Communication and learning (5)

This criterion brings together the following sub criteria: effectiveness of internal and external communications; encouragement of learning; and improvement in innovation competences. Good internal communication is of crucial importance to overcome barriers and ward of uncertainties. As innovation processes are learning processes, actors in a learning partnership must be willing to share their knowledge and learn from each other.

Overview of the self-evaluation process

The moderator team formed before the evaluation starts should display a degree of

independence from the specific interests of the different partners. During the first half day workshop the network-partners weigh and score the above outlined criteria. The evaluation approach is based on an individual and collective self-assessment on the actors – here either teachers or trainers or both together. Based on the criteria assessment the reasons for lower or higher scores are discussed by the actors.

After the workshop, the results are analysed. This can be done by the external moderator to guarantee that a concise summary of the discussion process is done and the results of the evaluation workshop get clear to everybody. These results are documented by a "list of strengths and weaknesses", by a "spider web", and other graphical explanations (bar and line charts). In a conclusive feedback meeting the "list of strengths and weaknesses" and the graphical explanations are discussed. The overall goal is to reflect on the results and to work out prospects for the learning partnership.

Third Case example: Process evaluation of the Bremen REBIZ network by the ERC Tool

Since May 2002 in the regional VET system of Bremen, which encompasses 22 VET schools, a six year long pilot programme on school autonomy and regional networking of work and learning partnerships is undertaken. The Bremen VET schools are transformed into semi-autonomous vocational competence centres. This is also the case at many other schools as part of new public management policy schemes and by the assembly of the educational ministries in the 16 German Federal States (Länder). The goal is to better prepare the local schools for the development of learning partnerships with the local industries [Kurz et.al. 2007]. The educational provisions of the schools shall be improved by developing new school programmes. This programme shall strengthen work place learning and guarantee a better interaction between theory and practice and work and learning. The re-organisation is carried through by internal teams within the schools which in some cases also include the trainers from industry. The evaluation of such networks using the ERC Tool was undertaken at the end of the preparatory phase. Ten persons belonging to the steering committee have been participating at this (first) evaluation meeting.

Partner views on the importance of the success criteria

The outcome of the weighting discussion in this process evaluation made clear that the Achievement of the Network Goals are seen as the most important success criteria for the network (21,5 % of the respondents); this is followed by the criteria Communication and Learning: (19,5%), Project Management: (18%), Resources: 16,5% and Partnership development: (14,5). Clearness of goals is seen important out of two reasons: goals can be better achieved when they are clear to all partner and individual school projects can be outlined better.

The judging process and its discussion: The criterion 'goal', which is seen as of striking importance receives rather bad scoring. Deeper insights can be gained by this evaluation method by looking at the results of the sub-criteria in more detail:

Goal setting process: The overall evaluation of the sub-criterion "goals clearly defined" is dividing the steering committee into two groups: five persons are giving scores varying from 3 to 5 and five persons from score six to eight. The discussion of these results made clear that the group giving the higher scores thinks that the clearness of the network aims improved fairly. The other group give evidence to their more negative scoring by judging the aim definition process as inefficient. Aim discussion with all actors within the network was missing. For the schools this had the effect of confusion and slowed down progress. Typical expressions of this lack of goal setting can be found in quotations like this: "The programme is not precisely prescribing aims. In between the schools, there are many different conceptions concerning the project's aims. It depends of oneself to be able to act."

Time Resources: The lowest score in REBIZ is for the availability of time resources. Concerning the relatively high weight (7,3%), this is a serious problem. In the discussion based on the quantitative figures, it emerged that the following points should receive much more awareness by the partnership:

- Better division of work between the steering committee members to overcome time constrains and develop better efficiency
- Improving the co-operation between the educational ministry and school representatives by making stronger use of communication platforms in which sharing of information gets easier.

Project management: One critical point here was that the steering committee is not really dealing with decision making but more functioning as a platform to share information. Project management is being done in the individual schools, not in the network committee. Another point is that the distribution of tasks between the ministry and the schools has to be readjusted. Distribution of work and yield is said to be quite well between the schools but not between the programme administrator (ministry) and the schools. The contribution of the programme administration to Rebiz was evaluated as being not satisfactory.

Partnership development: The partners put rather positive scores on the partnership development within the steering board. The composition of schools is well. but they exclude this for the partnership with the ministry.

Communication and learning: Competencies for innovation did not yet improve at the time of the evaluation. It was also judged that internal communication is rather good and that the partners are learning from each other.

Strengths and weaknesses: The project partners judged REBIZ as a whole as being in a rather bad stage at the time of the evaluation. The scores for four main criteria (taking the median) are below 5, just for one criterion (Partnership development) the score is above 5 (5,9).

Feed-back meeting

Eight weeks after the evaluation meeting a feed back meeting was held. The Rebiz partners agreed on evaluation results. There was broad support for a re-design of the co-operation structure also in relation to the other network partners (e.g. public administration, trainers in industry and other school teachers). The partners became aware that a re-definition of the steering committee's role was needed and that the communication and information policy of the network requires improvement. According to this new understanding, the committee was able to re-organise their partnership by a new communication policy.

Experiences from using ERC Tool in manifold contextes

The ERC Tool was used also in other pilot networks; either the cooperation of school and company partners in Beijing or in Malaysia during the implementation of the new dual training system and the cooperation requirements from institutes

and companies. In all cases the same Tool was applied.

Our experiences so far show that the dialogue triggered by the different sets of criteria enabled the company and school partners to recall the history of the partnership, pointing out the effects of the partners' activities, at once quantified (with the help of the quantitative elements of the evaluation method) and textual (the arguments and explanations on the scoring and weighting figures by the participants in the evaluation session).

Furthermore, in the reflection about the evaluation sessions in all cases it became clear that a major contribution of the evaluation was not just the identification of strengths, weaknesses and threats but also to allow more visibility of the state of the art of the co-operation practices. The members received a deeper understanding of their own activities in relation to other activities. After a lot of different evaluation sessions of that kind we found out that these partnerships are different from single organisations as they represent cross-cultural organisational settings. This calls for reassurance on what has been achieved by network partners and the delivery of specific designed evaluation methods [Deitmer and Heinemann et. al 2003, pp 246] [Ramli 2010] [Deitmer et.al 2008]

Conclusion and summative statement

We would like to conclude with a summative statement and some remarks on what these training tools allow for:

- (Part-time) trainers are good professional experts in their specific trade but in many cases they lack pedagogical and learning management skills such as coaching, tutoring and empowerment. Based on "easy to handle" but efficient training tools, the part-time trainer can develop in-company training plans based on key work and learning tasks.
- The EE-tool is directed to evaluate the co-operation process of the partnership as such in order to improve its management. Based on similar evaluation principles like discourse and participation, the SEVALAG evaluation tool is directed towards the evaluation of product outcomes of the learning partnership itself. SEVALAG assesses the learning potential of the

specific work and learning task (LAA) and the learning effects for the students.

- The self-assessment process with quasi-quantitative weighting and scoring helps to create a common "performance appraisal culture" for learning partnership members, a foundation for common awareness of efficiency and effectiveness. The participants judged the discursive and self-assessing character of the EE and the SEVALAG tool as being very useful for their project work and having a productive impact on learning. Most of the evaluated networks decided to use the method again in future to discuss the progress made. Or to put it in another way: the tools are dealing with the most important critical success factors for work an learning partnerships. So the big problem of non-participative evaluation activities is avoided, see Patton's [1997] remarks on this problem. The problem of making no use of evaluation results is avoided by directly involving the learning partners into the judgement process of the evaluation and putting them as evaluators into the forefront of an assessment.
- This potential of the tools should enable their use for a more general context outside the German dual system as well. They can accompany processes where learning and working meet and mesh, helping to identify learning potentials of work tasks as well as supporting the collaboration of actors with pedagogical and work backgrounds. As we know from theories of situated learning as well as from practice in different countries, making use of the potentials for learning inherent to work tasks to integrate work and learning is a general challenge that extends beyond countries using the dual system as well as beyond initial VET.
- In this respect, the tools should help the users to create common pools of knowledge and make them transparent for other desired users. Altogether, the use of different tools and facilities should help the trainers and learners to make better use of existing learning resources and to share knowledge on ongoing teaching-learning activities and of achieved results.

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