Designing effective workplace learning:

searching evidence for the development of Dutch VET

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Abstract

In the educational policy debate in the Netherlands, policy makers are in search for evidence based development. Referring to research practices in health and Medicine, innovations in education should be based on empirical evidence on the impact of educational measures. Vocational education and training (VET) moves towards competence based education, both in the Netherlands as well as in Europe (cf Biemans e.a., 2004). The European Qualification Framework (EQF) is the reference frame for national qualification systems. In the Netherlands, Vet is based on a mixed system: 2/3 of the students follow school-based courses, with internships in labour organizations; 1/3 of the students follow apprenticeship schemes, based on a labour contract. Work based learning forms in both schemes an important source of skilling experiences. Nijhof and Nieuwenhuis (2008) state that the belief in the skilling power of workplace learning is not always justified. The workplace is not always the most effective learning environment; in some instances the workplace is even a contested learning place (cf. Billett, 2003). Especially theoretical knowledge and learning to learn skills do need school-based support outside the workplace. On the other hand, work process knowledge, practical skills and social skills are well delivered through workplace learning.
Within VET, workplace learning is programmed in all courses, without much deliberation. The introduction of competence based VET, together with the actual political debate, has raised the need for more empirically based knowledge on the use of workplace learning in VET. For that purpose, the innovation body of Dutch Vet has challenged the first author to develop a practice based research programme, in which VET colleges and colleges for higher professional education, together with academic researchers investigate the impact of different work related schemes. Seven regional couples of colleges, including the Dutch Police Academy, have taken up this challenge and started the research project in late spring 2008.

The paper will present first results. The curriculum theory in use is investigated for circa 25 extended teams (teachers and company mentors). Through interviews and document analysis, a thick description is delivered of the professional choices made by these teams. Through observations and interviews with students, this description is checked in reality.
During spring 2009, a betting debate will be organized on the effectiveness of the observed schemes. This debate will offer the fundament for comparative and experimental research, scheduled for autumn 2009 and 2010. In the concluding paragraph, an outlook on the empirical debate will be presented.

1   The development of a mixed VET system

The Netherlands possess a unique system for vocational education and training: the mixed model. In this model an apprenticeship system and a school based system for VET work as communicating vessels: when economy is booming the apprenticeship system is growing, whereas during economic crises the school based system is taking over. This systemic mix of two learning pathways is rather unique in Western countries; in the Netherlands it took several decades to develop this system.

In the late sixties of the former century, working youngsters demonstrated for the effectuation of their rights on training, as laid down in a law since 1919! Growing youth unemployment around 1980 forced the government to establish a school based level 2 training system, delivering equal competences as the apprenticeship courses, which were traditional in technical and nursing vocations. In 1983, a governmental advisory commission for industrial development, chaired by mr. Wagner, a former CEO of Philips, gave the impulse for a national debate on the responsibility of employers and trade unions for the total system of VET (and not only for the specialised apprenticeships). In 1996, this responsibility is laid down in a general institutional frame within the law on vocational training and adult education (WEB): social partners accept the responsibility for the complete VET system, in return for decisive power on course definitions and examination arrangements. Since 1996, regional training colleges (ROC's) are responsible for the quality of the learning process in VET, whereas sectoral bodies , steered by social partners, are responsible for the qualification structure (comprehensive course definitions) and the learning potential of workplaces. To enhance the quality of examinations in VET, a new institute is established under the common steering of ROC's and social partners (later on this institute is embedded within her Majesty's educational inspectorate).

The mixed model, the communicating vessels of apprenticeships and school based courses and the co-responsibility for VET are slowly but steadily embedded in the institutional frame of the Dutch polder model for social affairs. In the neighbour countries in the EU, these institutional arrangements are quite different. Björnavold (2006) discerns six different models for VET in the EU:
  o The Scandinavian model: strongly school based, with an ample system for adult education
  o The Rhineland model, with dual trajectories, strongly supported by enterprises. Craftsmanship is highly esteemed in these countries (Germany, Austria, Switzerland), but the system is under pressure (Stoeger, 2007)
  o The Anglo-saxonian model, based on a low skill equilibrium and little formal training (UK, USA)
  o Mixed models with high governmental involvement (France, Belgium, the Netherlands)
  o Southern European models, with little VET and high emphasis on general and academic racks (Spain, Italy, Portugal, Greece)
  o Eastern European models, in the new EU countries, which had to copy Western models in the pre-accession period, but also kept parts of their older systems (Hungary, Romania, Baltic states, Poland)
Of course, this is a rough description of the rich variety of VET systems in Europe, but is shows the huge differentiation of educational systems for youngsters between 16 and 24. This variety is not restricted to educational aspects; Van Lieshout (2008) makes clear that differentiation in VET systems is closely related to differentiation in labour market systems: the appreciation of craftsmanship, the organisation of pathways towards the labour market and

the level of concern in the labour system for deliverance and maintenance of skills of the workforce are all building bricks for the construction of the markets for intermediate skills. Crouch c.s. (1999) shows that both state based systems and industry based systems have a hard job in maintaining a high skill equilibrium (Brown c.s. 2001), Each country has to develop its own institutional way, based on local conditions and historically grown traditions.

2   *Workplace learning as a hybrid phenomenon*

Workplace learning can be approached from two large perspectives. The first perspective deals with the organisation of labour, from which issues arise as work as a creative process in which expertise has to be used to perform optimally, but also issues as efficient use of resources in order to transform automation and benefits of scale in enlarging competitiveness. In this perspective learning is seen as adaptation to the demands of work processes and as preparation for future developments in technology and the global economy.
The second perspective on workplace learning is concerned with the development of skills and craftsmanship by youngsters (and sometimes by older workers and unemployed). In much educational research on vocational and professional training it is assumed that for the development of expertise the experience of real work situations cannot be left out: skilling trajectories consist of an sophisticated equilibrium between work based training and school based education. This second perspective is the field of vocational pedagogy and instructional science

Studying the learning potential of the workplace is relevant from both perspectives. Basically is the question whether the workplace is designed for learning: as Garrick (1998) stated: the workplace is a production environment, not a learning environment. For efficient and effective learning different requirements are put on workplaces as for efficient and effective working. It is not an automatism that work experience leads to profound expertise, but on the other hand school based trajectories are no good learning environments either (Resnick, 1996), at least for specific target groups. So the learning potential of the workplace is not an absolute dimension, but depending on many internal and external processes. Studying workplace learning is investigating the balance between work and learning.

In a knowledge-based economy, working and learning are connected processes. As De Wilde (2004) states, human activity has always been knowledge based, from ancient times till the 21st century. This could lead to the thesis that humans always are learning during performing productive activities. In our view, that is a too optimistic and romantic view: several conditions make learning at the workplace less obvious. Human work is design based: Taylor's approach of scientific rationalisation of industrial labour has been targeted at excluding learning at the shop floor. By rational designing labour, the highest efficiency would be reached by organising the learning and thinking at the front end of working processes: industrial engineering bans learning at the workplace in favour of efficiency and avoiding mistakes. The rationalisation of labour has got much criticism from more humanistic approaches of work, in which the autonomous worker is set to the foreground (eg. socio-technical approaches). The quality of labour and the learning potential of the workplace are depending on internal labour politics and company strategies towards economies of scale. As Billett (2008) states: workplace learning is contested through all kinds of negotiating processes within communities of practices and between workers and management.

Also vocational education and training are a matter of human design: educational practice and science both deliver insights serving as input for the design of learning trajectories towards efficient and effective support of trainees in becoming skilled and competent. The balance between working and learning can be seen from this perspective: what is the most effective route to enhance novices to conquer the mysteries of vocations and professions. The learning potential of the workplace plays an important role in this argument: what is the learning output of work activities and is how efficient is the learning process seen from economic and educational goals, compared to other training trajectories (eg. school based training or simulated practice). In our view, the learning potential of the workplace is a relational concept: the learning potential is both depending on characteristics of work and the organisation of work, as well as on the individual commitment and expertise of the trainee. Novices will learn differently with different outcomes as experts in comparable working-learning environments. Affordances of the workplace could be exploited differently for skilling objectives by different workers and collectives of workers.

3 The development of evidence based workplace learning in VET

In the Netherlands, the VET system is under pressure of new political and technological requirements. An innovation movement is started since 2000 under the umbrella of the introduction of competence based VET: the output requirements are not formulated in skills and knowledge, but in holistic, integrated competences (Toolsema, 2003; Biemans et al, 2004): students and apprentices are educated and trained for competent performance in the workplace. In the frame, also workplace learning is re-invented and redesigned.

At the same time, the public debate on educational innovation is opened: educational development should only be based on evidence based concepts and mechanisms. This results in a hybrid environment for educational professionals: at the one hand new concepts are required, based on labour market analyses, at the other hand these new concepts are viewed sceptically, because of lack of evidence.

Within this public climate, the project at hand in this paper is designed. The national board for innovation in VET has challenged both the scientific community and the VET colleges to join a collaborative research project, targeted at developing evidence based practice (and practice based evidence) for workplace learning in VET. Ellström's model for interactive research (2008) has inspired us to organise interaction between practical learning cycles in extended educational teams (teachers and workplace mentors), targeted at the development of evidence based practice at the one hand, and a scientific research cycle at the other hand, which is targeted at delivering more generic knowledge on workplace learning processes. As starting point the work of Nijhof and Nieuwenhuis (2008) is taken on the learning potential of the workplace. This process of knowledge creation through interaction is itself a social innovation: practical theory and formal theory encounter, where the practical system is searching for local solutions, whereas the academic researchers are searching for generalised knowledge. The challenge is the confrontation of both systems: how can they learn from each other and how can they support each other?

Six regional combinations of VET colleges and HPE (higher professional education) colleges and the Dutch Police Academy took up the challenge to organise local, practice oriented learning cycles around skilling trajectories in a broad spectrum of professions (technical, economic, caring), on several competence levels (3, 4, and 5 in the EU ISCED schemes). Each regional cluster organised R&D support within the learning cycles (local researchers and developers) and IVA, the institute of policy research of the university of Tilburg, took up the

challenge of developing practice based, generic evidence, through comparative research projects.
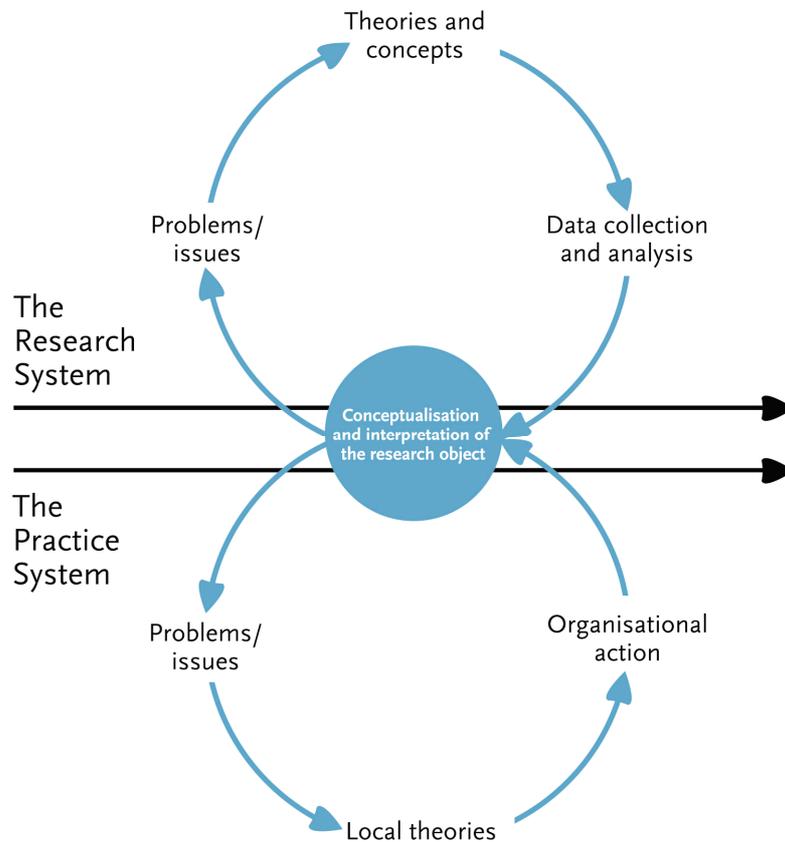

Figure 1: interactive research (Ellström, 2008)

The project organisation consists of a variety of meeting possibilities:
o A national developmental group, in which local project leaders and national researchers meet (target: coordination and theme selection)
o Regional, sector oriented groups in which teachers teams and local labour organisations meet (target: comakership between college and the world of work)
o College based groups, in which teachers, local researchers and developers meet (target: professionalisation and development)
o A series of national workshops and conferences, where not involved colleges can meet with project members (target: dissemination)
o A web based journal, where preliminary results can be viewed (target: dissemination).
o A steering group, in which college managers meet with national opinion makers on VET (target: development of public and internal commitment).

A preliminary calendar for the project gives insight in the methodology and working procedures, which are developed up to now.
o Stage 1 (march 2008 – September 2008): organisation of the project, formation of working teams.
o Stage 2a (September 2008 – April 2009): description of actual practices (through design interviews with extended teams and through interviews and observations of students and coaches)

- o Stage 2b (April 2009 – Summer 2009): discussion and debate on central themes for experimentation and comparative research
- o Stage 3 (two rounds between September 2009 and summer 2010): detailed comparative research on selected themes (natural experiments).
- o Stage 4 (September 2010 – Spring 2011): designed experiments on decisive themes (based on the results of stage 3).
- o Stage 5 (Spring 2011 – Summer 2011) wrapping up, reporting and developing of education tools.

At the moment of presentation of this paper, we are in between stage 2a and 2b. In the rest of this paper we will present some preliminary results.

4   Four central themes

Based on a review of scientific research on workplace learning (cf. Nijhof & Nieuwenhuis, 2008; Poortman & Visser, 2009), four leading themes are selected to steer the preliminary discussions and debate within the project.

1. Learning processes: (practical) theories and knowledge on the way how apprentices and students acquire competences and SKA's (skills, knowledge and attitudes). CompetencSKA's. Metaphors as acquisition, participation and creation of kwowledge (Sfard, …) play an important role in this theme.
2. Sequences of pratical learning: this theme concerns the education design of skilling trajectories: which forms of pratical learning should be organised in a curriculum or sequence of learning situations. Which forms of practical learning are suited for which stages of learning and for which students. Effectiveness and efficiency play an importnat role in this theme. Designing a sequence needs psychological insights, but also (labour) organisational arguments (risk avoidance; opportunities for learning of failures) are of interest.
3. Mentoring and assessment: what is the role of "learning professionals" (experts, teachers, managers, coaches) for workplace learning. How to organise different stages of interactive learning (cf. Categories of Blokhuis, 2005, and Poortman, 2007: perception (observation), instruction (listening, making notes), experience (try out), imitation (take over routines), agency, and participation (autonomous working)[1]? What roles can be discerned (role model; supervisor; buddy; coach, assessor); can these roles be combined or are they contrary? What kind of professionalism and tools are needed for effective execution of these roles?
4. Comakership: the organisation of common responsability of colleges and enterprises for vocational courses. Task division and collaboration between these stakeholders.How to organise connectionsto the local labour market requirements.

These for themes have been leading in the first two stages of the project. Based on these themes colleges and extended teams have chosen specific issues on which they would like to elaborate in the following stages of the project. So progress is developing through debate and collaboration.

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[1] This is a sequence in itself!

5 *Design arguments for workplace learning*

In scheme 1 an overview is given of colleges and courses, which are involved in the project. For each of these courses, the extended team is interviewed and documents are analysed, in order to get insight in the theoretical and practical arguments, teams are using for the actual design of workplace learning in the courses.

5.1   Arguments for new practical learning schemes

The 39 vocational and professional courses show a wide variety of traditional and innovative schemes for practical learning, both in the workplace and in in-school simulative practices. Traditional dual schemes are used for the Police courses: novice officers follow a training scheme of three months in-school training, combined with three months of in-service training and working at the police force. Each half year is dedicated to a specific set of competences (for example traffic control, crime investigation), both in the school period as in the work period. College and force have coordinated collaboration, and the novice officers become partially qualified after each half year (so they become increasingly employable during their three or four year course).
In Health and Technical courses we see both traditional apprenticeship schemes and innovative forms of practical learning. Apprenticeship schemes are applied for youngsters as well as for adult learners (upgrading of employees, is tailor made in-company training). In Health and Care courses a new phenomenon is developing: the learning department. Within care houses and hospitals complete departments are run by students from different levels (3, 4, 5), and mentors from the house together with teachers from the college, deliver remote supervision and in-house training and teaching. The classical master-apprentice scheme is changed into collaborative learning with colleague-students.
In Technical and Economy courses (facility management, restaurants) a major development is formed by in-school training enterprises. The work environment is simulated within the school context, or the college is taking over external services in a non profit way (for example delivering the catering in a facility for homeless people). Teachers take over the role of supervisors and bosses, and students work collaboratively on external deliveries. Sometimes enterprises and labour organisation command services and technical support from these in-school training enterprises; schools are encouraging this, in order to organise reality-like learn-work situations.

Each course and each (extended) team develops practical learning environments and sequences. The arguments and deliberations for these actions are quite divers: a major reason is a lack of real workplaces where students can go for. Depending on regional circumstances, there exist misbalances between the social demands for VET (students' choices) and the economic demand for VET (vacancies and training posts). Schools have to balance this by offering in-school alternatives. A second major reason is care for students with learning disabilities or low-developed 9social) competences: to protect these youngsters schools argue they have to keep them in a save learning environment. This argument is also turned around: enterprises do not always want to offer training positions to low skilled students or students from ethnic minorities.
A different set of arguments is concentrated around efficiency: mentoring and supervision are time consuming for colleges and enterprises; concentrating students in learning departments or in-school learning environments give the opportunity to deliver more support and learning

facilities. The same counts for in-company training of groups of employees: economy-of-scale plays an important role in the deliberations.

Also several educational arguments are brought to the fore in the interviews with the extended teams: improving the connection between practical learning and theoretical lessons; delivering a firm conceptual base before entering the work context (cf. Alexander, 2002); steering practical learning based on the (competence based) curriculum; (or the other way around) improving reflection and scaffolding activities through better knowledge of what is happening during workplace learning; new competence requirements ask for new learning environments.

5.2   Comakership and collaboration between college and work.

The commitment for VET from the world of work is huge in the projects in this investigation, but also here we can observe a large variety. On national level, sectoral bodies support both colleges and enterprises, in order to organiser effective skilling trajectories and workplace learning situations. In some sectors (eg. the police force) employers are largely involved in designing educational courses: they even agree on a reference set of norms, how to deliver workplace learning.

Learning departments in Health and Care can be regarded as win-win situations: For the houses and hospitals these learning departments help to overcome workload and some of the houses experience innovative impulses from the learning departments. For the colleges efficiency of delivering of supervision and training is welcomed.

Improving coordination of theory and practice is welcomed officially, but in practice this is one of the bottlenecks for VET. In the end, the rationality of production prevails over the rationality of learning in the workplace (cf. Nieuwenhuis & van Woerkom, 2007). All kind of coordination and collaboration mechanisms are designed and tried in practice, but a lot of problems have to be solved in this field yet.

A major problem is assessment of competence development: teachers do not have to possibility to follow competence development in detail for all the students, whereas mentors from the enterprises are not well trained for this part of the job.

Many of the innovative initiatives challenge the practical cooperation between teachers and mentors. In most interviews this is seen as a positive development: both teachers and mentors report opportunities to improve workplace learning and to professionalise themselves. In some cases we observe community development in the extended teams, which is a promising development for future improvements of vocational education and training.

5.3   On learning processes and sequencing.

Asking extended teams on their education theory in use for the design of learning processes and sequences of practical learning situations, turned out to be difficult to answer for them. The teams do not have an explicit theory in use. Most arguments used for designing and delivering training are quite pragmatic. Past performance and practice is the most used argument to design trajectories for the future. The search for solutions for new problems is pragmatic as well: nearby solutions are welcomed the most, whereas the search for optimal solutions is seen as time consuming (this fits with problem solving processes of other groups of experts, like entrepreneurs; cf. Gielen & Nieuwenhuis, 1999). There are high expectancies from chosen solutions, without much evidence based knowledge. So lot of educational design is trial and error, and not professional innovation, embedded in learning processes.

5.4 Towards comparative and experimental research

Based on the preliminary results of the first investigations and on intensive debate in two integrative workshops, the extended teams, together with the research team have decided to choose for six themes, which will be leading for comparative research in the next school year.

Collaborative learning.
In the projects several configurations of collaborative learning are developed. How can apprentices learn in a setting where they have to work with other students and apprentices. Which impact will be expected from these experiments?

Comparison of different work-learn environments
What kind of learning results do we expect from differently organised work environments? How is this related to different stages of learning trajectories: can we develop arguments for sequencing of work-learn environments?

Train the trainer
Which skill requirements can we detect for teachers and mentors in workplace learning? What kind of tools and support do they need for improving their impact? How do we have to deliver skilling trajectories for teachers and mentors?

Formality and informality of learning
What are the opportunities for formalisation of workplace learning (steering from the curriculum) and when do we have to deal with the informality of learning (organising post-hoc reflection and explicit learning)?

Adult learning
Do adult worker learn differently from youngsters? What is the impact of practical experience on the possibilities for learning engagement? Do trainers need different tools and skills for adult education in comparison with youth education and training?

Comakership and collaboration
How to organise effective collaboration between colleges and enterprises? What kind of requirements (institutional appointments; governmental support) are needed to enhance mutual commitment and learning processes?

Appointments are made to organise small research projects on these six themes. Research activities will be spread over the 39 courses; possibilities for comparative research will be organised. Each colleges has committed itself to join at least three of these themes, so the conditions for mutual learning have been shaped. At the moment of writing this paper, the preparations for this research adventure are in full run.

6 Concluding remarks

Although not all results of the interviews are analysed yet, the starting point for the evidence based programme for workplace learning in Dutch VET seems promising. The teams (and courses) offer a wide variety of practical learning schemes and the commitment of the world of work is great. Pragmatism is stronger than scientific educational reasoning, in deciding on

designing workplace learning and sequences, but the teams and colleges are eager to learn from each other and to join collaborative research and experimentation.

The improvement and innovation of workplace learning in Dutch VET can have a boost from this project, because of it integrative and integral approach. Interestingly, the project is also about workplace learning of teachers and mentors: they are learning and improving their own professional routines. During the programme this will be an extra agenda for research: how do professionals learn during collaborative researching their own professional behaviour. This will be a subject for the next RWL conference!

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