

Work-based Learning – in Industrial Engineering

Bente Nørgaard, Aalborg University, Aalborg, Denmark

Donal Nolan, Institute of Industrial Engineers, Waterford, Ireland

Ton Polman & Alle Delfsma, VOAA, Veendendaal, The Netherlands

Hans-Dieter Schinner, Int. Industrial Consult IIC AG, Frankfurt, Germany

Elina Parviainen & Iikka Upanne, AEL Oy, Finland

Ove Bayard & Magnus Areskoug, KTH, Stockholm, Sweden

Corresponding author's e-mail: bente@plan.aau.dk

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INTRODUCTION

The development of employees' skills and competences has become the key driver of economic growth in the developed world. It is widely recognised that it is mainly through enhancing people's skill and competences that future competitive advantage will emerge. Consequently companies need to be able to identify precise areas where they have, or can build, distinctive competences that will enable them to compete and stay efficient in the context of a modern dynamic market place. However skill and competence development aimed at especially post-graduate employees is still an area of great potential for progress. Nowadays, with the European Qualification Framework (EQF), the tool to accredit such skills and competences is available - even if they (the skills and competences) have been achieved through in-formal or non-formal learning.

A partnership of seven industrial engineering institutes from Ireland, Netherlands, Germany, Denmark, Sweden and Finland have set out to develop and test a model for skills and competence development for employees within a company environment.

Inspired by the concept of Work-based learning (Boud, 2001) and a facilitating approach to learning (Kolmos et al., 2004)), the partnership will develop a Work-based learning model aiming at industrial engineering – a WBL-IE model, which will be pilot tested in the partner countries and the learning out-come will be matched against the EQF. The intention with this research is to bring new knowledge and models to the field on continuing education, primarily within an industrial engineering context.

The research approach is inspired by action research, which is defined by a participatory process concerned with developing practical knowledge in an attempt to improve e.g. life of human beings (Lewin, 1946; Reason et al., 2003) and a case studies methodology (Flyvbjerg, 2006, 2011).

The WBL-IE partnership is to pilot the WBL-IE model in order to gain feedback from industrial stakeholders. This paper will describe the WBL-IE model and provide insight into the results of the preliminary pilot's cases; how did the industrial stakeholders receive the WBL-IE model when introduced to the concept?

1 THE CONTEXTUAL OF WBL-IE

The WBL-IE project is a Transfer of Innovation project within EU's Lifelong Learning Programme (Id. 84E43B20). Where the '*transfer*' is e.g. supposed to be the Facilitated Work Based Learning model (FWBL) (Fink et al., 2006). However, through discussions among the seven partners of the WBL-IE project the intention (due to difficulties with the FWBL model) slightly moved away from this concept and more in the direction of Work-based learning (WBL) focusing additional on learning objectives and assessments/accredit into EQF.

This move however, has been aligned with the continuously developing FWBL, which has indicated some difficulties with the FWBL approach – especially the role of the facilitator. Since the original focus with facilitation was based on the experiences of academic staff from a problem-based learning environment where 'real problems' are guiding the learning process, instead of identified learning objectives. Nevertheless, the WBL-IE still introduces a facilitator 'person' e.g. – as a company internal person or external person from the Education provider organisation.

The WBL-IE model developed is inspired by the concept of Work-based learning accompanied by a facilitating approach of the individual teachers or trainers of the WBL programme. The following paragraphs briefly introduce the concept of Work-based learning and the role of a facilitator.

1.1 Work-based Learning

Work-based learning (WBL) has its origin in higher education aiming at developing employees' competences in a collaborative setup between companies, employees and higher education institutions. The concept is not unequivocal and explicitly defined, it is often used in different contexts with different meanings and there is a wide variation in the mix of elements included, but David Boud provides an operational attempt to describe the concept. '*WBL programmes meet the needs of the learners, contribute to the longer-term development of the organisation and are formally accredited as university course*' (Boud et al. 2001 p. 4). The involved partners in WBL collaborations are: the company, the employee, and the university academic staff and a long-term collaboration between the partners is often intended. The employees are the focal point, since they are responsible for negotiating agreements with both the supervising manager and the university (Boud et al. 2001). The WBL course is based on the experiences of the individual employees and the goal can be a degree or a nationally recognised qualification (Burns, 2003). Unlike most conventional courses, there is no fixed syllabus; core content or essential disciplinary materials in the WBL programme '*work is the curriculum*' (Boud et al. 2001, p. 4, 7). The university academic staff are connected to the course and in varying degrees contributes to the learning process.

1.2. A Facilitating Approach

In the WBL-IE application the concept facilitation was introduced due to its relationship with FWBL - and FWBL's relationship to problem-solving as a learning process. But since the WBL-IE does not identify 'real problems' but learning objectives the WBL-IE partnership have to identify the role as facilitation in this new context. A facilitator can be defined as:

'Facilitation literally means "easing". Its art is in drawing out the wisdom already embedded and lying dormant in the psyche of the learner. Facilitators are people with the skills to create conditions within which other human beings can, so far as is possible, select and direct their own learning and development. A facilitator is a "process guide" who works with a group to assist it to achieve self-defining purpose.'(Gregory, 2002).

When elaborating the teacher or trainer's role as a facilitator it suggests openness towards the learner and contains a more balanced power relationship between teacher and learner. It signals open space even though there is still the task of guiding, advising and teaching the learner to tolerate insecurity and guide them in start-up and closing processes, etc. However, to be a facilitator of learning Rogers (1967) point out that the most important basic attitudes are sincerity and purity and when the facilitator is an authentic human being who appears as he or she is and enters into relations with the learner without any exterior, the chance of being successful is greater. Facilitation invites many different roles and forms of involvement in the learning processes. The facilitator's different roles may be described in relation to the degree of participation in the learners' course – identified as learning objectives. Being a facilitator in WBL-IE is a new role and therefore it needs elaborations.

2 THE WBL-IE MODEL

The WBL-IE model refers specifically to the achievement of planned learning outcomes (learning objectives) derived from the experience of performing a work role or function. One of the main differences between learning in the formal educational system and learning at work is that the former is based on formal, intentionally planned educational activities, while the latter is mostly in-formal by performing everyday work – 'work is the curriculum'. The WBL-IE process model will design and create a framework around, which the in-formal learning achieves structure and focus.

2.1. The Major Stakeholders

The four major stakeholders in a WBL-IE programme are the training provider; the company; the facilitator and the learner they all have different obligations and interest for getting involved in a programme.

The training provider has the initial contact with the SME and identifies the overall theme for the learning and also the overall timeframe. If possible the training provider estimate the resources needed to fulfil the learning objectives and identify the facilitator from the training provider organisation. The training provider is responsible

for preparing the final contract in collaboration with the company and the learners involved in the WBL-IE program. The contract is recommended to be a three-part contract signed by individual learners, SME and training provider – in order to have commitment and ownership from all involved. The training provider will ensure the quality of the WBL-IE program (in reference to EQF), so that all local regulations are met.

The SME is seen as the contract giver for the WBL-IE approach. Starting point for the SME is to identify needs, competences and subsequently the SME identifies the individual learners who can enrol in the WBL-IE programme. Together with the learner the SME is the initiator of the WBL approach. The SME should have a focus on competence development – and also in a dialog with training provider identify learning objectives at an individual level (learner level). Within the SME possibilities will have to be created by ways of policy to make WBL possible and available for the employees (i.e. learner). Also possibilities need to be created to give the learner the opportunity to work on the WBL-IE programme along with their daily activities. This means supporting the WBL-IE throughout the entire period of the process – it is very important to provide the time need and support structures necessary for a successful process.

The facilitator is the key person to keep close cooperation between the SME and the training provider. The facilitator must have knowledge about the learning context, understand the SME's activities, and be able to communicate with, and have a general understanding of the SME's requirements. The facilitator is not a teacher, but a supporter of a learning centred approach. The facilitator must encourage the learner to take ownership of his own learning process and involves the facilitator when needed. The facilitator is supporting the process of defining the learning objectives for the training and also has dialogues / interviews with the individual learning to identify content and level of learning.

The learners actively participate in the definition of the learning goals and in collaboration with SME and facilitator in specify learning objectives. They must be committed to the program and positively contribute to the progress and the coordination. The learner takes ownership of his own learning process and involves the facilitator when needed.

2.2. The WBL-IE Process Model

The stakeholders involved in preparing a WBL-IE programme are all indispensable for the development, however they contribute to the process in different ways and at different time in the programme.

The figure 1; is an illustration of the process of a WBL-IE programme, where the process is divided into a strategic level (the blue process flow) and an operational level (the green process flow). This distension of organisational levels is to make sure the programme has a strategic aim and commitment from the management level of the company and the operational process, is conduction the programme within a the company context.

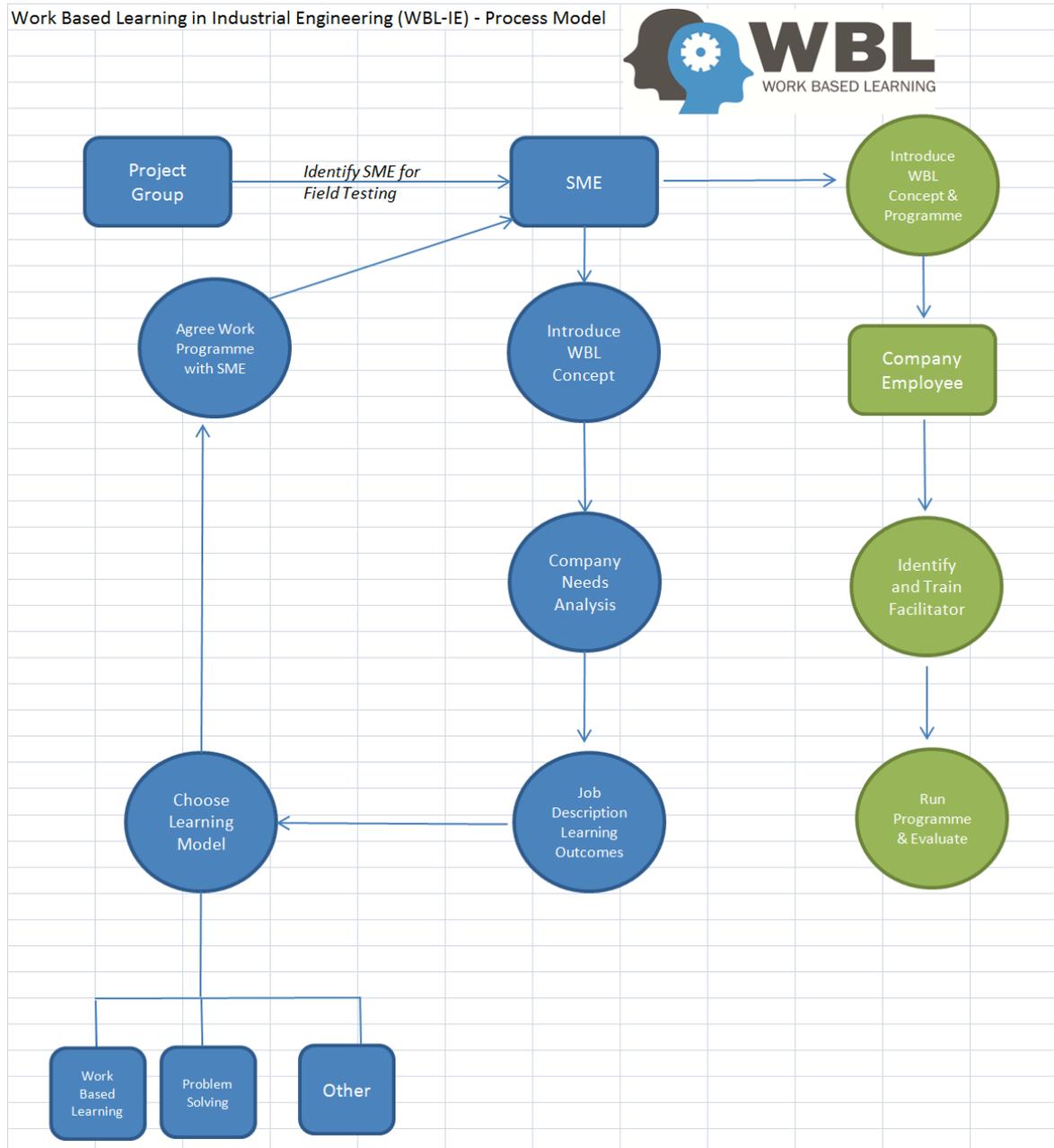


Figure 1: WBL-IE process model

The WBI-IE process flow is not to be perceived as a linear process; in fact it is an iterative process with the flexibility to be modified according to preferences and requirements of the organisation. The steps in the process are:

The strategic level

- WBL-IE partnership (training provider) presents the WBL-IE concept to the SME and the SME presents their initial identified needs for skills and competences, or area where training is required
- WBL-IE partnership performs a training need-analysis on the company based on an interview-guide prepared for the WBL-IE project

- The employees identified by the SME management as learner in the programme are interviewed and a 'Learning Outcomes Descriptions' prepared for each individual - based on which an individual job description with 'learning outcomes' is produced
- The most appropriate pedagogical approach is selected, based on the particular requirements of the SME and employee (learner)
- A WBL-IE training programme is created and agreed with the SME management and each individual learner – to ensure commitment a three part contract can be prepared by the training provider

The operational level

- The WBL-IE concept and process is again introduced to the learners and other stakeholders.
- If needed a internal facilitator is identified and trained according to the specific needs of the programme
- The training programme is initiated and evaluated.

The WBL-IE model is to be tested in the seven partner's countries to further develop the model and to identify possible cultural differences, which can be adapted to the process flow model. The actual implementation of the programmes has to develop through practise, which also will be a future activity of the partnership to analyse and conceptualise the process.

3 PRELIMINARY FEEDBACK FROM INDUSTRIAL STAKEHOLDERS

As the WBL-IE project is a bit behind schedule the partnership has so far visited a few company but have had several telephone contacts shortly presenting the concept in order to arrange a meeting. The collected reactions for industrial stakeholders so far, have been from very positive to reserve. These reactions though, are random according to who was responding and the person's position in the organisation. However, the focal matter of the introduction of the WBL-IE model - to base the learning on activities in the company - was generally appreciated. It also seems as if the SME's have been attracted to the possibility of having the training located at the company site and further more, that the WBL-IE concept has an element of being a tailor-made program designed to meet individual needs both in regards to the SME requirements and also the learners. However, it seems as if the message that a lot of the learning already is taking place in the companies - needs more explanation in relation to the WBL-IE concept as this can easily be misunderstood by the SME's. Although the amount of company contact to date is not statistically significant a general trend has begun to emerge. Many of the larger organisations contacted were particularly interned in the training needs-analysis aspect of the WBL-IE process, and view this aspect of the process as an efficient tool for identifying the key areas where their training strategies should be focused. On the other hand the smaller SME's did not think about their training needs in a strategic way, but more in a reactive way – once they were introduced to the WBL-IE process they recognised the advantages of systematically identifying the skill shortages in their organisations and delivering

training in practical and focused way. One small company with 20 employees appreciated the possibility to receive external support for the learning processes running within the company. They are small but active in complex problem solving in production of advanced components for industry.

Some quotes from the industrial stakeholders noted during meetings:

- *'this skills needs identification is important'*
- *'there is continuous change and it's difficult to identify the needs for know-how'*
- *'people are changing, situations are changing, it's difficult to identify what new know-how is needed and where'*
- *'yes, we need external help in identification and communicating that to workforce'*
- *'it's sensitive situation to talk to workforce about need for new skills and competences they start to talk about increasing salaries, unions etc. This cause problems at workplace external help could help us'*
- *'this matter is topical right now and very interesting. We need to take our HR in this'*
- *'we want to continue discussion. We have a need for this kind of activity. We hope and expect that the training provider is really interested about us, and our situation and needs in practice'*
- *'could we have the presentation? We'll discuss internally and get back to you'*
- *'challenging is to get workforce in co-operation. We need to get workforce committed to this'*
- *'this sounds like new way of acting for developing skills and competences'*

The companies signify that they have difficulties identifying the need for the right know-how [competences] likewise they want to make sure that the workforce [learners] are cooperating and committed to the process.

The general impression is that the WBL-IE concept was met by positivity and interest, which has generated plans for further actions. All of the companies were positive to more information and the impression is that the WBL-IE concept developed at the actual company is the best way for further actions.

4 CONCLUSIONS

The conclusions at this stage of the WBL-IE project period show that the industrial stakeholders generally are receiving the WBL-IE concept with a positive attitude. They seem to catch the core concept of founding the learning on activities and requirements within the company and they value that the training is located at the company site. Furthermore the element of WBL-IE being a tailor-made program designed to match the individual needs of the learner is also articulated as being positive. However, more descriptions are needed on the learning, which already is taking place in the company- some organisations were a little hesitant towards the collaboration and commitment of the learner resource to the process.

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