

# UNDERSTANDING WORK BASED LEARNING

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*This paper discusses the understanding and acceptance of the methodology of Continuing Engineering Education integrated into the organisation as Work Based Learning facilitated by university teachers. The model is based on years of experience with Problem Based Learning and Work Based Learning. The discussion is based on outcome from a survey including questioning engineers, managers and university teachers about their acceptance of Work Based Learning. An EU Leonardo project funded the work on this new methodology for Continuing Education.*

## 1. Introduction

Most innovative companies are aware of the importance of improvement of professional competence, but even though professional development is identified as vital for the future of the company, the individual engineering staff member often tells that he must find the time for such courses himself – they are not integrated in the time-plan for the project. Money for financing the course is normally no problem – but *time* is (Nørgaard and Fink 2006).

A challenge for many Higher Education Institutions' (HEI) world-wide is to start delivering continuing education (CE) to private organisations. This challenge has provoked universities to move to new forms of CE methods among which Work Based learning (WBL) has attracted much focus and interest. However, the definition of WBL is not unambiguous but covers a broad range of work related education. Ranging from University students participating in courses partly taking place in a private organization to employees in private organizations attending a well defined 'on the job' learning programme defined from employees and employers (company) demand. The focus in this paper will be the latter definition related to continuing education, which still covers over different definitions.

Boud and Solomon (2001) define WBL as a partnership between an external organization and educational institution. The Learners involved are employees of the external organizations and the programme followed derives from the needs of the workplace and the learner rather than being controlled or framed by the disciplinary or professional curriculum. A Significant element of work based learning is that the learning projects are undertaken in the workplace. The educational institution assesses the learning outcomes of the negotiated programme with respect to a framework of standards and levels. "Work is the curriculum" they say.

Burns and Chisholm (2003) define WBL as a methodology that can be adapted to address undergraduate engineering education at pre-university, university, postgraduate and continuing professional development stages of education.

The most essential diversity of the above mentioned approaches to WBL are - how the demand for learning is defined. Is work the curriculum? Or is the programme controlled and framed by the university curriculum? Within the partnership of our project (Leonardo-project 2003) a new approach was introduced - WBL inspired by problem based learning (PBL). This approach - Facilitated Work Based Learning (Fink and Nørgaard 2006) recognizes that 'work is the curriculum' but the pedagogical method - the facilitation of WBL - is based on PBL.

Therefore the partnership agreed on a short definition of WBL to be used in the research on the knowledge and understanding of WBL. This short definition of WBL was presented within the interview and the questionnaires:

*Work Based Learning (WBL) is Continuing Engineering Education integrated into the daily engineering tasks. The learning objectives are defined in collaboration with the company, the engineer and the university based on the company strategy and preferences of the individual engineers. The university professors will facilitate the learning process and supervise the engineering staff in the learning process and how to apply new knowledge into daily engineering tasks.*

The main aim of the EU Leonardo funded work on new methodology for Continuing Education (Leonardo-project 2003) was to bring the theoretical concept of WBL to real-life work places and to test it in practice. Furthermore, we wanted to investigate the general attitude towards WBL within the target group. For this purpose, one task within the project was to conduct interviews and a survey with teachers and companies concerning Work Based Learning and Continuing Engineering Education in the participating European countries. The following is an evaluative summary of these interviews with a focus on common understanding and acceptance of Continuing Engineering Education implemented as Work Based Learning. The research was carried out in the two main target groups, namely the university teachers as facilitator on the one hand and the companies as provider of the work place on the other hand.

## 2. Results from interviewing university teachers

Based on a common interview guide a number of university teachers were interviewed in each partner university. The teachers were questioned about their interest in and experience with teaching CEE courses, about their knowledge about Work Based Learning and their immediate interest in being involved as a facilitator in WBL. Also the teachers experience with interaction and cooperation with industrial partners was investigated. As the sample is relatively small and the answers of the participating teachers were not very detailed it would not be adequate to take this as a representative sample for a quantitative survey. Therefore, this qualitative evaluation rather addresses some central and more general points to get a feeling for the overall attitude. We decided to focus on some crucial topics. For structuring the outcomes the answers and conclusions are grouped by topics and contents.

### Importance of CEE

According to our interviews, importance (the meaning) of CEE is in most cases rated very low by the university teachers. However, it is interesting to notice, that the interviewed teachers are either very much involved in CEE or not at all interested in it. Normally university teachers and researchers are very busy doing research and teaching regular students. They therefore question why they should be involved in this extra task.

University teachers involved in CEE will normally be contributing in the field of their research interest. Teachers normally experience that links to engineers in industry can be very fruitful for their research and be an inspiring input also for their teaching obligations. Furthermore, the interest in CEE seems to be dependent on good conditions including sufficient payment or adequate application. Those who are already doing CEE of course attach more importance to CEE, as some of the interviews show.

### Knowledge/Importance/Comprehensibility of WBL

Concerning this topic, there seem to be the most significant differences between the partner countries involved. In *Hungary*, for example, the concept of WBL is - at least according to our sample - not widely known among teachers, and they only show interest in WBL if they are also interested in CEE in general. The interviewed teachers in *Austria* do know a bit more about this new concept and most of them are interested in it. That is probably because most of them are already involved in CEE and therefore are familiar with the special requirements of this kind of education. From their point of view, WBL would be a good answer or solution for this field. In *Finland*, the concept of WBL also is not very well known but most of the interviewed teachers are at least interested. Probably this is because the acceptance of new methods that could solve certain limitations of CEE or other fields of education generally is rather high. Although the interest in CEE in general is not very high in *Portugal*, the concept or at least the notion of WBL seems to be familiar for some of the teachers and most of them also show some interest in it. One reason for this might be that most of them are involved in some kind of industry cooperation. In *Spain*, some of the teachers have experiences in CEE. WBL is only known in a few cases but there is some interest.

We can observe that in general one idea is very dominating: course content and learning objectives are normally defined by university professors. This means that when learning objectives are defined by the learners' need, the teachers will question whether the learners will

learn the right thing, whether they can keep focus etc. Some of the answers also indicate that teachers believe the learning outcome should be a Degree or at least some credits.

### **Pedagogical Training**

It is noticeable that in most of the countries involved there seems to be no compulsory pedagogical training for university teachers. This kind of education will normally depend on the teacher's own initiative and even more often it is learning by doing. Especially in the classical engineering sciences obviously pedagogical background is not regarded as necessary. However, you might question whether it is possible for the teacher with poor pedagogical skills to improve by just practicing? Only in one partner university assistant professors must follow a 175 hour pedagogical course to qualify for an associate professorship.

### **Benefits of WBL**

Although the concept is not very well known in most of the partner countries, it seems that many of the possible benefits are obvious to the interviewed people. We grouped the benefits by topics which certainly are not independent from one another and have some overlaps between the named features and possibilities.

#### Industry/University cooperation

Under this heading all benefits related to industrial contacts or cooperation are collected. A central benefit for some teachers was that it seems to fulfill the requirements of both sides: time saving for companies and adequate for the need of the engineer. It looks like a win-win situation if it is well prepared and well done. WBL is identified as a basis for a stronger relationship with the industry, a closer interoperation between industry and research. It provides support in the company and brings new insights from research to daily working place. By this methodology even senior developers can be trained. Establishing a close contact to industry will give the teachers a better understanding of the work place and of the conditions for application of their research results. This new knowledge will improve also the more traditional course based CEE. For all the interviewed university teachers it seems to be obvious that the WBL methodology will be a good way to facilitate application oriented learning, a lifelike learning with a good connection between theory and practical context.

#### Appropriateness and Effectiveness

It is also a general understanding that WBL is learning on demand, where you only learn what you need to learn at the time you need it, and that the learned material can be directly used and implemented by the learner in his/her job. Such a tailor made learning process is well suited for reflection on actual problems and questions and addresses the concrete situations the learners are facing. Work Based Learning is rated to be more effective learning, more flexible and better focused on the learners and his company's needs.

#### Problem/Solution-orientation

With learning supporting the process of problem solving it becomes much easier to communicate about the learning problem. Teaching is tied more tightly to relevant and real problems when based on identified needs in daily business. The problem can be explored more broadly.

#### Individual benefits for learners/teachers

Coaching and learner centered individual mentoring based on real engineering problems gives the university teachers a deeper insight in the tasks engineers are meeting in real engineering activity. This will be an important inspiration for them in their on-campus teaching for students. Work based learning gives good opportunities for the learner to blend his practical experience with new theoretical and academic inputs. This is a perfect method for actual and future demands of personal development.

### **Disadvantages of WBL**

Although the concept was frequently not known, the interviewed teachers saw many possible disadvantages (!) First of all, the teachers expect the methodology to be very expensive and time consuming, and therefore lack of resources could be a problem. This is an expected immediate reaction. Tailoring programmes for individuals or teams takes time. Another concern is the organization and the implementation of a WBL programme. This will involve teachers and learners from two very different organizations with tight schedules and with different ways of activity planning. CEE is normally not given a very high priority in the daily business, and this might have negative effect on the planned learning activity.

Facilitation of learning related to daily engineering problems will often give a deep insight in topics of high importance for the company. The teacher must therefore be prepared to sign a non disclosure agreement (NDA) and make sure that he will not be in a conflict with other present or coming contacts or activity.

Planning and facilitation of a learning process meeting learning objectives defined by some specific industrial needs is not easy for many university teachers. The industrial needs are normally defined using other words (tools and solutions) than professors normally use in their courses (methodology and theories)

Even though we plan to integrate the learning process in daily engineering activities, the engineer will still not see learning as working time. Finding the right balance between work and learning might therefore be difficult. The learning method will require quite a firm commitment from the learner, and this will only be possible if we succeed in keeping a strong connection between learning material and identified competence needs.

As mentioned the answers were not necessarily based on any experience from the teachers. For teachers it is quite normal to believe that lecturing is the most important thing in a learning process. Therefore they were very concerned about the learning outcome, and more teachers expect that the learning in WBL will be limited, that learning will be concrete but not in deep. They also question how such an activity should fit into a well planned academic year.

Focus on quality is another crucial point: Will all university teachers be able to do this, and do we have quality of service of education methods adequate for this?

### **3. Interviews with Company representatives**

The following summary of the interviews with companies is primarily an analysis of the general climate for CEE and consequently for WBL in companies in the different partner countries. Here, we want to re-emphasize that the sample for the evaluation of the companies is very small and not representative. Therefore, we tried to concentrate on some general outcomes and insights.

#### **Size and Age of company**

Most of the interviewed companies are quite large except for Hungary and some of the Portuguese companies. A similar partition seems to be true for the age: Most of the companies are older than ten years or are an amalgamation of older firms except for Hungary where many of the companies are younger than ten years due to the political changes and for Portugal where in most cases, the industry still seems to be more small-structured than in other European countries according to our small sample.

#### **Importance of CEE and WBL and connection to context**

In Austria, especially the big companies rate the importance of CEE rather high. Most of them have their own strategy for CEE or even an own department. And even if there is no explicit strategy, there is of course a certain orientation. In most cases, there is also a budget for CEE and the average employee spends at least a few days per year for Continuing Education. The emphasis lies on Continuing Professional Development with technical courses that are sometimes in house and compulsory. They should preferably be cheap and efficient, e.g. a special and self-developed "Skill Development Programme" in one company. One reason why these companies value CEE quite high is probably their size. Another associated reason is that they want to keep their employees for a longer time and therefore see CEE as an investment in

the company's future. Consequently, the concept of WBL is very interesting for them because this may be a new possibility for implementing their strategy.

In Hungary only 2 out of 10 interviewed companies have a clear strategy for CEE but more than half of them have at least some kind of budget for CEE. The engineer must take the initiative, but the manager must approve it. All employees spend some days per year for CEE, mainly for professional development. Less than half of the companies know the concept of WBL and the same ones are interested in it. As the size and the structure are different from Austria, Hungarian companies generally don't rate the importance of CEE as high. This is probably because they are small and the employees usually don't stay longer than a few years.

In Finland, nearly half of the interviewed companies have a strategy for CEE and nearly 40% have their own budget for this issue. Thus, all employees are spending a few working days (2-10) per year on some kind of Continuing Education. Like in other countries, the engineer himself has to take the initiative. Although most of the companies don't know the concept of WBL yet they would be very interested in working with it. It seems that - similar to the teachers - companies in Finland are more motivated to test new or innovative methods.

In Spain, approximately two third of the companies have some kind of global strategy for CEE, but it is not very specific for the individual engineer. Often Continuing Education is budgeted with no specific amounts for each engineer. The amount of time spent per year is mainly dependent on the economic situation. Traditional courses - often in house - are the basic method for professional development. Sometimes, additional multimedia material is used. Most companies show some interest in the concept of WBL but they do not state very clearly, why.

In some of the small Portuguese companies, there seems to be no strategy and also no budget for CEE. It mainly seems to be a private activity, but at least some companies do have both. The decision whether to invest in CEE seems to have nothing to do with the size. The same is the case for big companies: one for example spends 1% of the salary and 3 days per year for it. In this case, the courses are for professional development of the everyday tasks.

Some of the companies have heard about the concept of WBL and are also interested in it; one already has experiences with it. The possible benefits of such a method from their point of view are lesser efforts for traveling and supervising and that it could suit the needs of the company and the employee. It would also be cost effective and flexible. But like the teachers, they see problems with establishing the process between companies and universities. Furthermore, they see difficulties in the definition of objectives. Most of the companies in the participating countries have some kind of co-operations with universities: mainly via joint research activities, internships or sometimes also for continuing education.

#### **4. Conclusion**

Initial results from pilot projects on facilitated work based learning show that bridging the gap between learning and working is a very difficult process. There is still a great deal of research to be done to develop effective methods for universities to disseminate research-based knowledge to applications in society.

#### **5. References**

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## **Curriculum Vitae**

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