

Paper to the Symposium
Education & Training in Explosives
at
Shrivenham 15-17 June 2005

Theory in Practice

Author: Hanne Randle
Researcher at
APeL in Lindesberg, Sweden
PhD student Karlstad University, Sweden

hanne.randle@apel.nu

<i>Introduction</i>	3
The urgent need to upskill employees	3
Lifelong learning and employability – the European model	4
Tacit skills and learning from trial and error	5
<i>Vocational Qualifications and perhaps a European model for occupational standards?</i>	6
EUExcert	6
<i>How can learning, education, and training be demand-led?</i>	7
Demand-led training	7
<i>The Pedagogical model</i>	9
A combination of formal and informal learning in the process of learning	9
Definition of the term competence	11
<i>Workplace learning</i>	12
Qualified Vocational Training Programme QVT	12
Developing workplace learning as a pedagogical model	12
<i>Conclusions</i>	14
<i>References</i>	16

Introduction

In this paper I shall present some ideas of how education and training in the explosives sector can be organised at the workplace. The paper shall also present ideas of how company managers can communicate their demands of learning to education providers. Workplace learning creates new opportunities for employees to access learning in flexible ways, where learning programmes are based on individual prerequisites and needs and adjusted to company demands.

This paper will focus on workplace learning as the arena for learning and highlight a joint initiative in the explosives industry in Sweden where a government agency, several companies and a municipal learning centre develop a vocational and education programme together in order to train and educate new and old employees to work in the explosives sector.

The urgent need to upskill employees

There is a great need in the explosives industry to find new ways and methods to maintain and develop skills and competencies which exists among the employees in the industry as they are about to lose many of their highly skilled employees as they are due to retire. However the situation on the labour market in Sweden gives mixed signals, on the one side there are many people unemployed who are highly educated and on the other hand companies cannot recruit people with sufficient skills¹. There exists a mismatch situation on the labour market with high levels of unemployment and skills shortage at the same time (Faurbaek 2004). The ongoing restructuring of industries is one cause to unemployment as many companies have downsized and displaced workers. Many young and well-educated employees are forced to leave companies because of labour market regulations. People cannot find work on the labour market as they lack sufficient qualifications to meet the demanded requirements in basic education or they lack entry-level skills. Many companies experience they cannot find people to recruit with sufficient skills to qualify for entry-level requirements. (European Commission) Younger people are no longer seeking career opportunities in these sectors of the industry. During periods of restructuring, few newcomers are allowed to enter the businesses as company manager's focus too much on short-term results.

This situation is getting an acute dilemma for many companies as they are experiencing it a difficult task to replace the older generation of workers. These older workers have devoted their entire life to the company and the industry and they are regarded as highly skilled and key employees. Many of these tacit skills are not easy to access. Many of the employees for example in the explosives industry have in order to learn how to become a skilled worker participated in training programmes at the workplace, where they have learned the jobs from their peers. This is a problem in the downsized companies of today as there is no slack in the manufacturing process to allow for people to work alongside each other in order to learn a job. In the end, this trend to focus too much on profits could lead to a skills shortage and a lack of knowledge of the trade, as skilled older workers leave the company and there are no newcomers taking their places (Randle 2004).

Lifelong learning and employability – the European model

The expression lifelong learning is widely accepted and introduced from the European Commission as a tool for increasing individual employability and as a mean to increase company competitiveness. Living in the new society entails learning in order to be employable and flexible in the labour market (European Commission 2001). People around Europe will have to get used to the idea that their future work life will include participating in learning activities in order to be able to maintain employable skills (Jacobsson 2004). The task to supply learning initiatives should be a shared responsibility between the company owners, company managers, and the community's agencies. The European Commission simply states that;

Companies have a duty to maintain the employability of their workers, while workers have a duty to participate fully in the training to maintain their own employability. (CEC 1998:6)

There is an ambition in the European Commission to make Europe the most competitive and dynamic knowledge based society in the world by introducing the European Employment strategy. Ways to reach the objectives are to increase the citizen's level of education, by offering each member tailored opportunities for learning during their entire life. By investing in citizen's knowledge's and skills employability and social integration can be promoted. Lifelong learning is to be realised through activities that are set up as a combinations of formal, non-formal and informal education. The definition of the term lifelong learning is expressed from the European Commission as:

all learning activities that are carried out during a persons life that aims to increase knowledge's, skills and qualifications from a individual, citizenship, and social or employment perspective". (KOM, 2001, 678:10).

However, the responsibility to create conditions for increased employability is to be divided between the company owners, company managers, and the workers. The European Commission state;

Companies have a duty to maintain the employability of their workers, while workers have a duty to participate fully in the training to maintain their own employability. (CEC 1998:6)

The globalisation and technological development affect many companies economically. To be able to increase or sustain economic growth a few changes need to be introduced in the industry. The manufacturing process is changing from a labour intensive to a knowledge intensive production. Social skills and problem solving will become ordinary tasks in work. Reading, writing and numerical skills are classed as basic requirements in many jobs of today.

Brown, Green and Lauder (2001) have made extensive research to find evidence which can support that one nation can prove to be more competitive than another nation by investing in learning. Brown point out some critique toward human capital theory for its narrow minded economically motivated approach to developing higher skills in the work force (Brown et al, 2001). His opinion is that investments in human capital must mean investments in the self. He can see how the situations in the slimmed organisations of today are at risk of failing in the

task to motivate employees to work along tedious assembly lines. It will be necessary to organise workflow to more advanced work tasks where workers have real influence in planning the production. This can lead to, if combined with investments in lifelong learning, that workers can see a meaning in doing the job. Brown also states that individuals have the potential to become skilled in socially constructed activities and that learning is to be seen as the new form of labour. Brown wants to make it clear that learning is not to be seen as something that happens exclusive of work.

Tacit skills and learning from trial and error

To work in the industry of explosives is not a child's game. To learn to do the job through copying how others do the job can turn out to be fatal. Working in the industry requires from the employees that they can reflect on their tasks and calculate for risks. Accidents with explosives have claimed the lives of more than a thousand people around the world since the turn of the millennium (Nilsson & Wallin 2004). The loss of lives can lead to a significant loss of skills and production. Human failure has caused many accidents, which often has its roots in the lack of skills and training. As the terms of manufacturing are related to hazard, it is linked to jurisdiction and legislation. The organisation NIEF makes up the supervisory and inspection board. They authorize explosives and issues licenses to manufacturing companies.

In many other manufacturing companies in other sectors of the economy like the steel sector, the way to learn to do the job goes through years of practice and trial and error. Employees learn the ropes from their colleagues and by experience (Boud 1999). Mistakes can sometimes result in personal injuries and in increased manufacturing costs as the manufactured items have to be scrapped, however they do not very often result in fatalities. To learn the hard way is very often the way to learn in life but it is not the right method for learning in the industry for explosives. So why do not all company managers demand company adjusted training for all their employees? We can list a few bullet points to why this is not a simple task:

Following issues can function as barriers for long-term planning of learning initiatives;

- Managers lack the skills for knowing how to demand learning from the communities agencies
- There is a lack of experience in organising learning activities in the organisation
- Managers lack motives for organising activities relating to competence enhancement issues.
- Slimmed and downsized organisations only provide for small chances to spare the employees to participate in learning during working hours.
- Middle management not in favour of developing work contents.
- Reluctant learners – the learning environment is not in favour of organised formal learning.
- Static work organisations where general knowledge and skills are not required.
- Low levels of autonomy in work teams and employees.

How can the demands for learning be communicated in a more general way where the issues of both the needs for competency development and a platform of basic skills are addressed? The aim should be to develop a systematic approach for learning and education for the next generation employees in the industry of explosives? In the next section I shall describe a developmental project in the explosives sector in Europe funded by the European Commission through a Leonardo da Vinci programme called EUExcert.

Vocational Qualifications and perhaps a European model for occupational standards?

The transnational Leonardo project EUExcert² is running from 2004 to 2006. By developing a competency framework and occupational standards each country can develop education programmes to fulfil the requirement in the occupational standards. The ambition is to develop a European model and standard for Vocational Qualifications for the explosives sector in Europe.

EUExcert

EUExcert has the ambition to provide a comprehensive framework for developing competency programmes for the industry. This will include several steps such as; training programmes, education programmes based on a particular curriculum of subjects, topics, and knowledge necessary to generate and develop the competencies demanded from the industry. Based on this it is necessary to develop training and education contents, which will be general enough to be applicable to the different countries in Europe but specific enough to provide a general knowledge for working in the industry for explosives. The idea is to make the training contents available in modules to reach a high degree of flexibility. It is necessary to adapt the contents to suit employees at all levels in the industry but particularly to each individual's educational background. (Nilsson & Wallin 2004) By collaborating with competence and research centres EUExcert can develop tools for assessing competency and skills needs in the industry adapted for long-term planning and future demands.

The present task is to develop the grounds where the demands for competency development can be discussed between the branch organisations in Europe, the company managers, human resource personnel, trade unions and the communities' agencies when can provide an infrastructure for learning at the workplaces. The basis for such discussion should be the dilemma of the ongoing restructuring of the business, which requires slimmed organisations, the introduction of new technology and at the same time skills enhancement (Bengtsson & Berggren 2001). The risk of skills shortage in the industry of explosives is also important as new technology is used to handle material manufactured in the old days, which requires the skills and knowledge from the past. EUExcert can carry the role of a speaking partner to start discussion about the consequences of focusing too much on short-term profits in relation to sustainable development and to highlight investments in learning compared to corporate competitiveness and sustainability. To initiate discussions about introducing limits in the entrance of low cost manufacturing enterprises on the European market could be additional tasks for EUExcert, as this could jeopardize the development of safe workplaces and the continuous development of low-risk manufacturing conditions.

Companies in the explosives sector must maintain a high level of safety in the manufacturing processes as a secure production is key factor for survival not only figuratively speaking. So are there any simple solutions to finding ways to adjust investments in learning to company demands and at the same time learn more about the whole process? In the next section I shall illustrate how thinking demand-led education and training gives another meaning to both company managers as to education providers when organising learning based on assessed learning requirements at the workplace.

How can learning, education, and training be demand-led?

How can the company managers solve the problem of finding skilled people to employ, just in time when they need to recruit? One way is to organise learning activities at company level together with the communities' agencies in a partnership approach as part of labour market initiatives. Unemployed people can participate in training where they learn company specific skills together with generic skills. By working in partnership with the communities agencies unemployed people get a chance to get practical experience from working in the explosives sector and the company can recruit future employees.

Demand-led training

Svensson & Åberg (2001) argues that workplace learning is a good way to introduce demand-led learning for adults. The workplace can be the arena where training and education is provided and based on both company and individual demands.

The training activities should be based on the specific needs found in the workplace and build on the employee's earlier experiences and skills. Learning should take place and be planned as an integral part of work, where people participating in training feel a strong connection between training and their work tasks. It is also important to make sure that people feel that they can use their newly acquired skills in their work. Reflection³ should be part of learning to develop skills that can be used in both work life and in everyday life.

The system of education is not very flexible when it comes to supply vocational education and training matched to company requirement (Svensson 2004). Education agencies often supply formal education in packages suited for larger homogenous groups which becomes a problem for company managers, as they cannot afford to invest in huge vocational programmes. Organisations and individuals seldom demand these ready-made packages instead they demand customised and flexible solutions. Company managers lack skills to make an analysis of their own demands and their demand is often to train and recruit only a few people at the time. Another problem is that organisations and individuals seldom demand these ready-made packages; instead, they demand customised and flexible solutions adapted to each situation and company. This matching problem can be described as a gap between the demands set from the companies and the supply of learning services provided from education institutions. The education providers are not flexible enough in their variation of programmes and courses especially when it comes to time and place. They cannot provide programmes that are easily adapted to company or individual requirements. In addition, there is often a mismatch between the contents in courses and the required skills necessary when learning to carry out a task.

Education agencies that are successful in supplying demand-led vocational and educational programmes know how to broker between company demands and the supply of learning activities. They have the knowledge and tools to assess employer's demands for competence. They organise demanded training and education into activities that are both flexible and accessible. They provide courses, which are flexible in both length and content. Individually adjusted study plans reflect previous knowledge and skills, which are assessed through a system for accreditation of previous education and work/life experience. Courses are flexible enough to provide an opportunity to study part-time, at work, at home or at a local learning centre. They create support structures for distance studies if and when based on computer technology. Trained facilitators make up support structures for individuals. Finally, they are successful when integrating individual learning activities as part of an overall organisational

change process. They make sure that company managers have a plan for each employee to use their newly acquired skills in their work. (Randle 2002)

The gap in matching different demands with the supply from educational institutions is illustrated in figure 1 below.

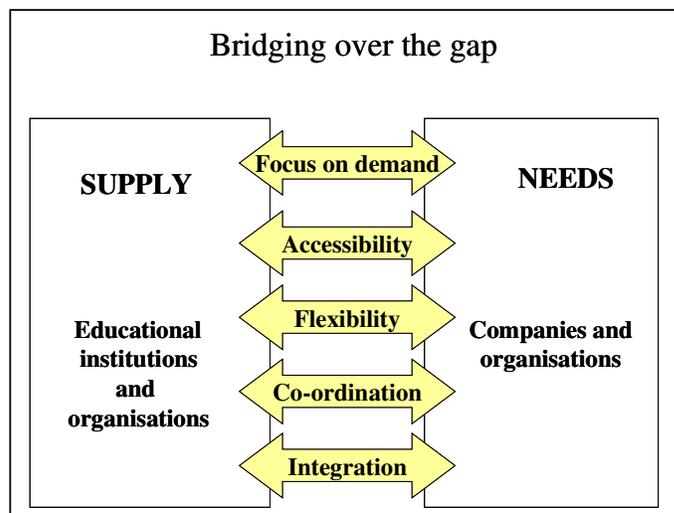


Figure1. Gap between system of educational supply and educational demand.
Source, Svensson L & Åberg C, 2001: 176

The supply-side, the traditional system of education and their agencies, is illustrated on the left and the demand-side is illustrated on the right. The picture shows a gap between supply and demand. As seen in figure 1 this gap can be divided into five different components such as; Focus on demands, Accessibility, Flexibility, Co-ordination and finally Integration.

The model is used to illustrate the theoretical gap and a way to reach a greater understanding that the idea of organising demand-led learning requires a systematic approach.

To put *focus on demands* it is necessary to make an analysis of the employer's demands for competence. Few of the steps require the knowledge and usage of certain competency analysis tools such as the assessment of individual and organisational needs and accreditation and validation of previous skills and knowledge. Individual study plans could be the result of analysis.

Next step could be to organise demanded training and education into activities that are both flexible and accessible. A way to make the learning activities more *accessible* is to adjust them to the unique needs found in each organisation and to base them on individual prerequisites. To further organise activities that reflect different learning styles and need to study in own pace are pedagogical models adjusted for personal requirements. When setting up individually adjusted study plans previous experience should be reflected and result in customised *flexible* courses for each person in both length and content. Previous knowledge and skills should be valued and based on a system for accreditation, validation of previous education and work/life experience. In order to offer the possibility to study part-time, at work, at home or at the learning centre it requires *flexibility* in the learning activities in time and place. When arranging for learning activities and distance studies based on computer technology it requires *organised support* for learners. Personal support can be organised by trained coaches or by competence advisors or instructors. Education agencies can provide

tools to help the management in organisations, in the process of assessing individual and organisational demands and then *co-ordinate* activities in order to satisfy the demands⁴. They can also co-ordinate learning activities between enterprises and individuals. Another important step is to *integrate* learning and training with work. Is it possible for the employees to use their newly acquired skills in their work, will the learning make a difference in how they carry out their duties in their work? The individual learning activities should be part of an overall organisational change process and a vital component in the process of assessing demands.

In the next section I shall describe how demand-led learning can be illustrated as workplace learning in a pedagogical model.

The Pedagogical model

Are there any good pedagogical models for learning that can be used to illustrate learning at the workplace? In this section I shall describe a theoretical model for describing the learning experience for adult learning which includes previous and practical experience as the foundation for learning new skills and competencies.

A combination of formal and informal learning in the process of learning

To establish an interaction between the work and educational system we have to get a deeper understanding of learning – both of the formal learning (in the educational system) and the informal learning (at work). In figure 2 we have illustrated how a combination of formal and informal learning will lead to a competence, which can be seen as an interrelationship of theoretical and practical knowledge.

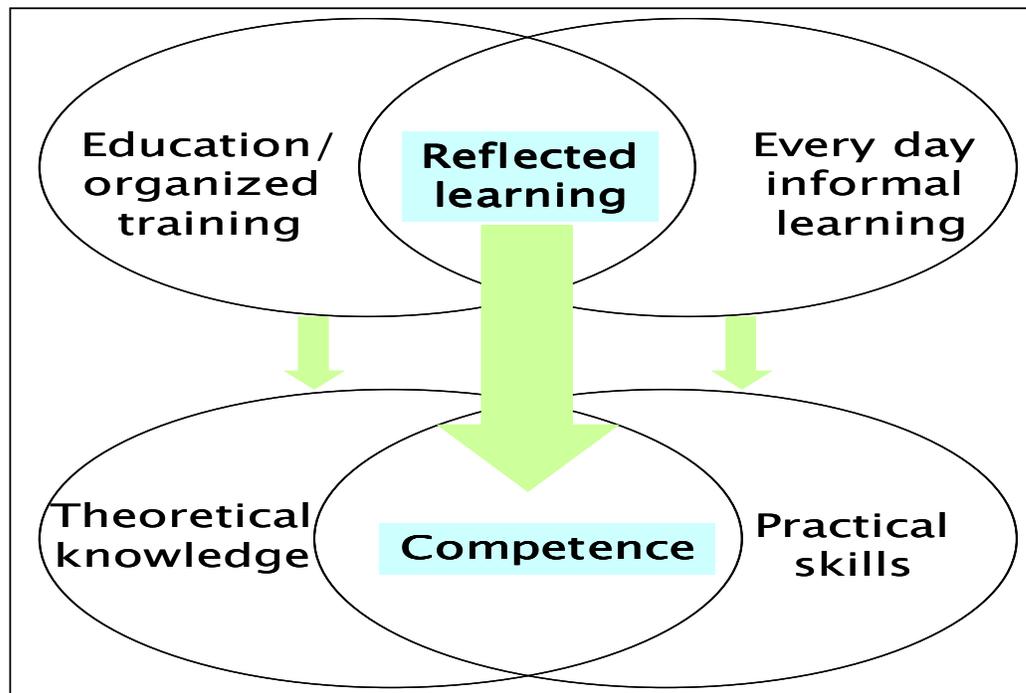


Figure 2. Competence as a Result of Reflective Learning (Svensson & Åberg 2001).

As used here, the concept of formal learning refers to planned and goal oriented learning which occurs within the boundaries of particular educational institutions (schools, colleges, universities etc.). The concept of informal learning refers to learning that occurs in everyday life or at work. Everyday learning occurs spontaneously for the most part, but it can to some extent be organized – by work rotation, work exchange, field trips, bench marking network meetings, input from supervisors, mentorship support, guidance etc.

In modern work life neither formal education nor everyday learning alone is sufficient – both are needed and the two modes of learning should be viewed as complementary. Formal learning can be effective only if backed up by informal learning (Boud 1985, 1999). Conversely, informal learning could be made more effective if supported by formal learning. This is the case as informal learning presupposes conceptual tools and explicit knowledge about the task and the work process that cannot normally be acquired through experiential learning at work. Rather, the knowledge that is acquired through informal learning has typically an implicit character (Ellström, 1992).

It is in this combination of formal and informal learning that results in reflective learning (see figure 2). The distinction between formal and informal learning is important in order to emphasize that learning is not to be equated with education. Education offers explicit, theoretical knowledge so-called propositional knowledge. This can go on without the participants learning anything that can be used in a practical way in everyday life or at work (Ellström 1996:87). Competence does not necessarily come out of formal learning – i.e. education (see figure 2).

When previous experience and knowledge is assessed and accredited as valuable ingredients when planning individual study plans, it will work in favour of people actively choosing to participate in learning activities. Elkjaer (2000) argues that each person participating in learning activities have different prerequisites to bring into the situation. This should mean that when organising learning at workplaces people's previous experience should be considered at a large extent, especially when planning contents and activities.

It implies that all present experiences grow out of past experiences, which in turn leads to future experiences. We do not enter an educational or learning process as a blank page. We have experiences we bring into the learning process. (Elkjaer 2000:93)

Boud (1985) argues that if learning situations were created where earlier experience is systematically introduced, as a vital part through reflection it could contribute to a higher understanding for learning. This could also add to the sense of meaning, as the participants feel motivated to use their earlier experience in the learning situation. A way to develop practice is to use reflection as part of the learning process. Boud (1999) argues that time should be allocated for reflection as part of learning activities. His idea is that learning by using reflection will create opportunities for each person to actually relate to the learning experience by using their previous experience and by combining mind, heart and actions into the experience as a platform for further elaboration. By allowing individuals to reflect on their learning process together with an instructor or a coach and in groups together with other learners they can understand the meaning of their activities.

Modern, integrated production systems mean intellectualising work, i.e. increased demands for theoretical knowledge and intellectual skills – e.g. the ability to discover, identify and

solve problems. The new production systems put greater demands on integration of different types of knowledge, i.e. the ability to discover correlations and understand the whole work system and the production flow. The Swedish trade unions stress the importance of formal learning as a way to increase the general employability of the employees (LO-report 2001, 2002). What does it mean to become more competent in working life? In the next section I shall try to define competence.

Definition of the term competence

Competence can mean several things. It can be understood as a description of a persons ability to act and it can be understood as description of a person intellectual capacity as in knowing things and finally it can be understood as a combination – a person knowing when and how to do things. The workers and members of the trade union for steel and metal workers in Sweden have defined the term competence (Metall 2000) and it gives another understanding of the concept which goes beyond a person's ability to carry out a task and the ability to develop the task (Ellström 2002:1). The trade union definition emphasises a person's aspiration as part of their competence. Competence describes what a person *knows*, what a person is *able to do*, what a person *wants to do*, and what a person *dares to do*. *Knowing* is to possess theoretical knowledge. The *ability* to carry out duties is to possess previous experience and informal knowledge. A person *wanting* stands for ambition, attitude, and approach and for setting up goals. *Daring* stands for self-confidence and self-esteem. By using this concept of competence the person behind knowing and doing is coming to shape.

In the next section I shall describe how reflected learning can be made possible in a workplace situation where the ambition is to combine formal learning with informal learning practices. Practical experience is developed into skills and supported by theoretical knowledge in a real working environment in order to develop individual competence.

Workplace learning

This scenario is developed and tested within the framework of a pilot study in the explosives industry in Sweden. The education programme is developed together with national education agencies, a municipal learning centre and several private companies⁵ and aimed for both unemployed people and employees from each participating workplace. The participants receive a Qualified Vocational Education Certificate, Technician degree, after their 40 week training programme.

Qualified Vocational Training Programme QVT

The employees who wish to take part in the training programme need to apply for a training position. Each participant has their own individually set up study plan, which is based on earlier education, experiences, and skills. The study time is divided between on-the-job training together with colleagues and studying in the learning centre using distance-learning techniques. Company demands and individual requirements and aspirations decided the contents in the vocational education and training programme. However the course includes certain compulsory parts; subjects like knowledge of explosives step 1 and step 2. In addition they can study subjects such as team dynamics and other specific skills required when working with explosives. They also have the opportunity to participate and develop work processes and develop quality standards. The estimated time for on-the-job training is at the minimum 26 weeks out of 40. The participants experience a strong connection between training and work and in some companies' organisational changes has been the result of employees taking part in qualified education and training. Each person has the option to study the compulsory courses in his or her own pace. The bases for all theoretical learning is distance studies with the help of ICT or live sessions by web cameras broadcasted from the learning centre or from other plants presented by video communications. Study materials are especially written to suit flexible studies at distance.

A trained study facilitator (provided and trained by the learning centre) is always available for the participants. Instructors come to the mini learning centre on a regular basis either to support the students or to give traditional lectures. The students can always communicate with instructors and study facilitators either by e-mail, phone or by fax when they are not present. The members in the groups support each other in their learning. The learning centre coordinates the activities between the companies in order to supply demanded learning activities.

Developing workplace learning as a pedagogical model

The programme was developed and based on the experiences learned from the initial pilot programme however the vocational training programme is developed both in length and contents to suit national requirements and individual and company needs. The introduction of a national certificate, built on a national standard required the prolongation of the programme, which also means that the participants get more time to learn the job.

The pedagogical model has also been changed as a result of evaluations and dialogue with the students, the company managers, study facilitators and instructors. Today they run an introductory study programme where the participants can get a feel of what adult learning is all about, where they learn how to learn. They have also discovered the importance of developing support structures for both social and technical support. This is important

especially when it comes to how participants value the experience of learning. Building support structures can mean to build up ICT-support, well functioning communication, developing social skills in instructors and facilitators, well organised training, etc.

The participants study theoretical subjects in mini learning centres at the company in much smaller groups and during times they prefer and when it suits the company. Students who have no colleagues to study together with go to other companies to study in their mini learning centre in order to have learning companions. The number of subjects to study has increased. However in the initial pilot programme the participants could study basic/core skills as an option, this was part of a government initiative for adult education in order to promote upper secondary qualifications for adults. This kind of funding does not exist any longer and it is reflected in the QVT-programme. The theoretical subjects are work related. As the participants are scattered around the country the learning centre organises for joint learning sessions where all the participants can get together as a group.

The practical training includes working in a real situation – where a (trained) mentor is guiding the on-the-job training previously a specific production line was set up for the participants.

Below in figure 3, is a description of the pedagogical model for workplace learning.

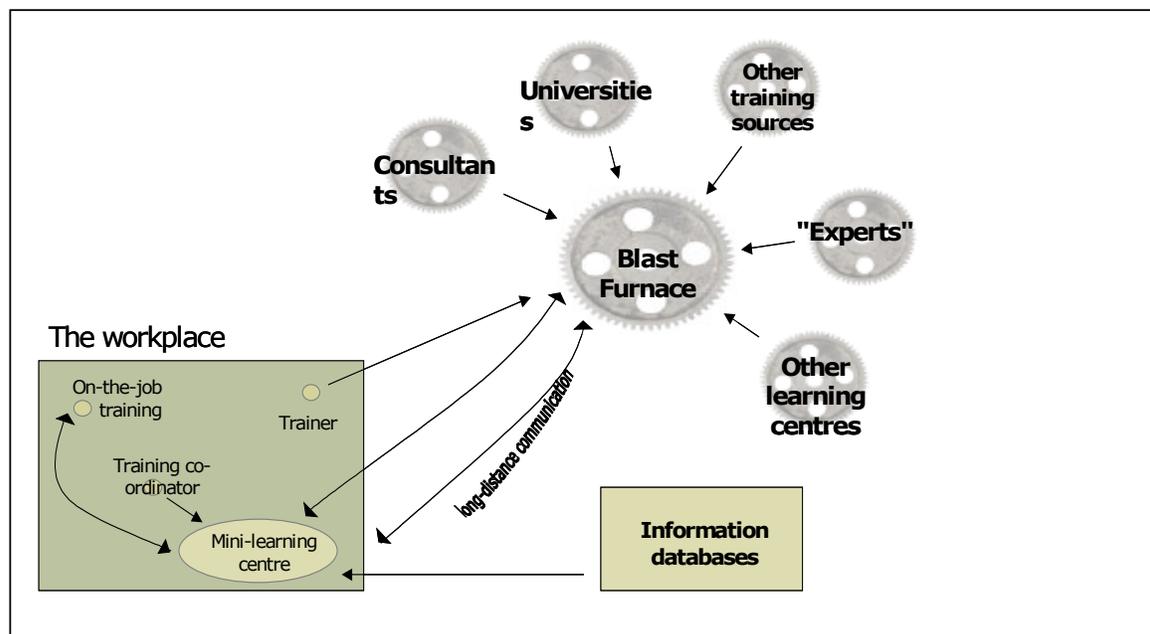


Figure 3, The pedagogical model for workplace learning

The figure (3) above describes a model for workplace learning as it is practiced in the example described in the paper. As you can see the Learning Centre is placed in the middle and surrounded by other agencies in the community. The workplace and the learning arena – where education and training meets in the mini-learning centre and on-the-job training are placed to the left to. The arrows mark the communication between the components.

Conclusions

The Swedish cases show that it is possible to find ways to recruit people to work in the explosives sector if people are provided with learning and training programmes that are untraditional and flexible. To place the learning environment and arena to the workplace level makes it possible for the participants to complement theoretical education with practical training. It is easy to access both formal and informal learning and this is especially appealing for company managers and adults in the labour force and a true challenge for adult education providers.

To organise for learning at the workplace can create new opportunities where old traditions, skills and experiences can be transferred to newcomers in the industry and this is becoming a problem for many companies as many of their old employees are about to retire. By combining practical training in a real life situation together with workmates the participants can bring in new ideas and critical reflection based on their theoretical understanding of the job situation instead of just copying old behavioural patterns from their colleagues. This can lead to the development of work tasks and workflow. To allow employees to become more inquisitive in order to develop work contents and the workplace they need to be provided with new opportunities to participate in workplace improvements.

By introducing facilitated mini learning centres as part of workplace learning it is easy to adjust training to company requirements in time, place and cost efficiency. The employees need not leave the company in order to participate in learning. Mini learning centres are cost efficient as employees from other firms can use them. Collaboration with education agencies and other companies in the same or other sectors develops a joint and better understanding of the competence development and skills enhancement needs in the industry. This can lead to the development of new agencies and education and training programmes such as the QVT-programme for technicians in the explosives industry in Sweden.

For the individual the idea of learning while working is not new as informal structures for learning is still the basic model for learning at many workplaces. However the opportunity to be able to combine practical and theoretical learning at the workplace is new, as it requires from the participants to use new learning techniques. This requires from the individuals that they can take charge of their own learning processes and progress. With the help of instructors, facilitators and other participants they can learn how to learn. We have also support from evaluations and follow up studies that the introduction of pilot programmes can lead to more employees wanting and desiring to participate in education and training programmes (APeL Rapport 1, Jacobsson E, 2004, Randle 2002).

There is also a challenge to create an understanding among company managers of the idea to invest in workplace learning in order to create a learning environment where practical and theoretical learning can be combined. Many company managers and education providers lack the knowledge and skills to organise for demand-led education and training. The two systems are accustomed to the old traditions of education and training where companies send their employees off to courses provided by the education agencies and where the participants sometimes have to study courses they already know. In order to create a learning culture in line with the thoughts of lifelong learning the arena for learning could be placed at the workplaces. The workplace is the most important learning environment for many people. The way companies invest in niches and core expertise means that the task-oriented expertise must for the most part be acquired at work (Aronsson & Sjögren 1995). This could become an

incentive for future collaboration about learning initiatives between companies and education providers. The government is funding pilot projects as a mean to initiate collaboration between companies and education agencies and providers in Sweden. To change the system for education and work (in Sweden) seems to a bigger issue to solve – however it is a challenge.

References

- Aronsson, G., & Sjögren, A.** (1995): *Samhällsomvandling och arbetsliv*. Stockholm: Arbetslivsinstitutet.
- Apel Rapport 1** (2001). *Utbildning ger möjlighet kriga på global fredsmarknad, (translated Education gives a chance for warfare on the global peace market)*
- Bengtsson, L & Berggren, C (2002):** Produktionens förändrade roll – mager klickfunktion eller kunskapsfabrik? In *Lärdilemman i arbetslivet*. Lund: Studentlitteratur
- Boud, D., & Garrik, J** (Eds.) (1999): *Understanding learning at work*, London: Routledge
- Boud, D; Keogh, R & Walker, D.** (1985): *Reflection: Turning experience into learning*. London: Kogan Page
- Brown, P** (2001): Globalization and the Political Economy of High Skills. In Brown, P; Green, A & Lauder, H (2001): *High Skills. Globalization, Competitiveness and Skill Formation*. Oxford University Press.
- Brown, P; Green, A & Lauder, H** (2001). *High Skills. Globalisation, Competitiveness and Skill Formation*. Oxford University Press.
- CEC** (1998): *Managing change*. Commission of the European Communities.
- Elkjaer, B.** (2003): Social Learning Theory: Learning as PARTICIPATION IN Social Processes. In Easterby-Smith, M. & Lyles, M. (eds.). *Handbook on Organizational Learning and Knowledge Management*. London: Blackwell.
- Ellström, P-E** (2002:1): Lärande i spänningsfältet mellan produktionens och utvecklingens logik. Abrahamsson, K (Eds): (2002): *Utbildning, kompetens och arbete*. Studentlitteratur
- Ellström, P-E** (2002:2): *Workplace Learning, Reflection, and Time*. Centre for Studies of Humans, Technology, and Organizations. Linköping University
- Ellström, P-E.** (1996). *Arbete och lärande*. Förutsättningar och hinder för lärande i dagligt arbete. (translation: Work and Learning. Prerequisites and Obstacles to Learning in Daily Life). Stockholm: Arbetslivsinstitutet.
- Ellström, P-E.** (1992). *Kompetens, utbildning och lärande i arbetslivet*. (translation: Competence, Education and Workplace Learning). Stockholm: Publica.
- European Commission** (2001): *Making a European Area of Lifelong learning a Reality* Communication from the Commission
- Faurbaek, L** (2004): Competition versus Regulation in (Eds.) *Learning to be employable*: Palgrave, London
- Garsten, C & Jacobsson, K** (2004): (Eds.) *Learning to be employable: New agendas on work, Responsibility and learning in a globalizing world*. Palgrave, London

Jacobsson, K (2004): A European Politics for Employability. The political discourse on employability of the EU and the OECD. In Garsten, C & Jacobsson, K; (Eds.) *Learning to be employable*. London: Palgrave, pp 42 - 62

Jakobsson, E (2004): Draft. *Utvärdering Kvalificerad Yrkesutbildning – KY – För Tekniker inom Explosiva och Brandfarliga ämnen*. APeL Lindesberg

Nilsson, A & Nyström, Ö (2001) *LO – Rapport, Kompetensutveckling*

Nilsson, E & Wallin, H (2004): *Vocational training for personnel in the Swedish Explosives Sector*. KCEM

Metall (2000): *Kompetens och Kompetensutveckling, Metalls policy*

Randle, H (2004:1): *Learning at work: - A mean to creating company competitiveness*. Lindesberg: APeL : published at www.euexcert.org

Randle, H (2002:1): *Conditions for learning, - flexibility to promote learning and education*. Paper to the First International Conference on Training Employability and Employment – in London

Randle, H (2002:2): *Lärande på arbetsplatsen i flexibla former på Nammo Vingåkersverken*. APeL Lindesberg

Randle, H; (Ed) Eriksson, I; Haunch, P; Bennett, T (2004): *Learning to become employable by learning to work in the health & social sector. A new career path in life*. Paper to The International conference on Workplace Learning, the learners' perspective. Copenhagen Denmark

Randle, H & Svensson, L (2004): *Team work and restructuring – self-exploitation or empowerment?* Paper to conference on Teamwork in Trier 2004

Svensson, L (2004): Lifelong learning – A clash between a production and a learning logic. In Garsten, C & Jacobsson, K; (Eds.) *Learning to be employable*. London: Palgrave

Svensson, L & Åberg, C (2001): *e-learning och arbetsplatslärande. (translated e-learning and workplace learning)* Bilda Förlag, Stockholm

¹ Recent figures show that 25 percent of the unemployed people in Sweden have acquired academic exams, the level of unemployment is measured to 5,8 percent of the labour force in June 2005

² www.euexcert.org

³ For more details about tacit knowledge, informal, non-formal, formal training and education connected to a learning situation, see Svensson L and Åberg C, 2000.

⁴ In Sweden professional consultants have taken on this duty to make Step 1 needs analysis for companies, often in connection to competence enhancement in accordance with objectives of European Social Fund, Objective 3.

⁵ Masugen i Lindesberg KY utbildning – för tekniker inom Explosiva och Brandfarliga ämnen