Coop PBL in VET

Report

Evaluation of the sustainability of the implementation of PBL/PJL based on e-learning cooperative learning in VET

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1. Introduction to Project's sustainability

Project sustainability is one of the major challenges in the project's development phase. Sustainability can be defined as the ability of a project to maintain its operations, services, results and benefits during its projected life time. In this case, the project can be considered as sustainable if its outcomes continue after the end of EU funding.

The Oxford English Dictionary states that something sustainable is "[c]apable of being maintained at a certain rate or level". Sustainability is a very broad subject which in one of its senses may include topics like maintaining a website, updating the contents of the project products, seeking funding, building lasting partnerships, developing new adaptations/versions of the project products, going deeper in pedagogical level, share technical solutions and tools, share benefits, etc.

It can be said that projects have to be sustainable with the human and financial resources available, but criteria for success are not only linked to institutional resources but also to the availability of expert know-how and the skills to motivate key multipliers to participate in the project extensions.

When the sustainability has been evaluated by Coop PBL in Vet partners, several issues have been considered:

- Level of feasibility of continuation of delivery/using main project products.

- Changes stimulated or caused by the project

- New initiatives and ideas caused by the project

However, the issue of sustainability should also be seen within time, and in this case, educational context, including not only VET centers, but the different VET national systems and policies of countries of the transfer's receivers partners participating in the project, in this case: Spain, Germany and Hungary.

For that, CooP PBL in VET partners have discussed during meetings, filled a common sustainability questionnaire and analyzed external factors having influence in the future.

In order to prepare the following report, two criteria have been considered to be key factors to ensure this sustainability:

1. The intensity and diversity of the use of the main outcomes and achievements after the end of funding. In this case, the main outcomes are the main products:

- the developed pedagogical model describing how Project Based Learning and KPE tool has been applied in Vocational Training of Mechanical Manufacture, described in the Pedagogical Guide.

- the KPE, developed as a collaborative tool to support the development of collective projects.

- the PjBL Based e-Learning Toolkit including useful and methodolgical materials to help and guide the implementation of PBL in VET training.

2. The intensity and enlargement of the cooperation, considering the opportunity:

- To enlarge the local networks (at regional/national levels) in order to encourage, animate and support the implementation of the project's outcomes

- To maintain and/or enlarge the partnership in order to incorporate in the futures other domains of entities to go deeper in the done work or to develop new project connected or based in the results of Coop PBL in VET.

In the present report, project level factors considering the quality and feasibility of the final products has been considered to evaluate the sustainability, as well as the capacity of partners to allocate adequate resources to continue applying the products in their every day respective training practices.

Other context level factors have been too considered, understood as external elements to the project itself, but that will influence the sustainability in the future. In this case, it is the possibility to obtain institutional and socio-economic support.

According the Handbook on Sustainability of International Cooperation Projects in the Field of Higher Education and Vocational Training (2006, European Commission Directorate-General of Education and Culture), an important sustainability factor is the quality of project in meeting academic, professional and/or social needs.

In this case, it can be said that Coop PBL in VET is accomplishing with this factor, due are facing real needs of students, socio-economic actors and labour market, as has been expressed in the rationales of the project.

Coop PBL in VET faces the changes that are constantly taking place in the organization of the work, in the technological environment and in the innovation practices of companies, have motivated a demand in the labour market of Mechanical sector of other competencies added to those of purely technical character.

As example, we can mention competencies related to teamwork, communication, self work organization, resolution of problems, self learning in the work place, individual time management intertwined with the collaborative time management or creativity. To have this type of competencies are in addition to those who facilitate the mobility, both labour and geographical, and the capacity of learning all along the life. To answer to these demands of the labour market, and to train profiles adapted to the needs of the companies, the vocational training systems and institutions must overcome the challenge of being able and willing of providing interdisciplinary competencies (cross sectoral), and to adopt to the different models of learning that focus on working with the "real life problems'. To make this effort of adaptation, they need to update their curricular programs in order to provide a major flexibility and multifunctionality to their training activities, applying didactic/pedagogical methodologies that reduce the distance between the theory and the practice, the planning and the implementation, the thought/reasoning and the action.

To be able to carry out this process, didactical/pedagogical methodologies that are based on practices used in the enterprises and in the projects that occur on the real work have been outlined as suitable to provide the interdisciplinary competencies and to facilitate the integration of vocational training and real work life. Through the former practices, it is possible to provide new experiences and competencies that are essential for the future professional development of the students

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2. Main project's outcomes and achievements overview

Changes in companies related the work organization, ICT and innovation, are motivating in the labour market an increasing demand of other competencies added to those of technical character - team working, communication, problems resolution, self-learning, time self management or creativity. To answer to these company's needs, VET Schools must to innovate their educational approach. Experiences at technical university level have demonstrated that Project and Practice-based-Learning (PjBL&PBL) methods and e-collaborative training IT are suitable to provide these interdisciplinary competencies, with the involvement of industries and the active participation of the students in learning processes.

CooP PBLinVET developed experimented and validated a pedagogical model to implement Project & Practice Based Learning didactical methods supported by collaborative e-learning tools in VET Mechanical Manufacturing. This pedagogical model is composed by several main products:

-**A " PjBL Based e-Learning Toolkit**" with didactical contents , resources , tools, assessment procedures and user's manuals, to be used in practices sessions with VETstudents and teachers.

-A on line software for collaborative working, adapted from KPE, to facilitate VET students the development of their assigned projects during their practices stages. It is available on line, and can be supported and monitorized by their VET teachers and practice trainers and tutors.

-**A "Pedagogical Guide to Implement e-Collaborative Project and Practice-based-Learning in Initial Vocational Training Programs"**, that describes the pedagogical model, completed by other resources to be used by teachers, tha are available in a Moodle eLearning plantform.

2.1 . Description of the PjBL Based e-Learning Toolkit

This toolkit is basically composed by pedagogical tools and documents to support the Project Based Learning Methodology in VET practices.

The central idea of the education based on project development is that the trainees learn in team, analyzing and developing a project based on real premises situations, being employed as much individually as in the team depending on a few objectives and a clearly defined distribution of tasks, and problem-solving capability. To develop the project, they must develop their aptitude to apply knowledge and skills acquired before.

Practice Based Learning tries to involve the trainees as active subject of their own learning process. Since they will be constructing and adapting knowledge and developing competencies as they are looking for solutions to the raised problems in real work situations, they will go deeper into the matters of study and practice. This method promotes the synthesis, application and co-construction of new knowledge.

The classical PjBL method has been adapted to VET needs to develop this Toolkit, in order to guarantee that:

- The proposed tasks and problems to be solved by the project are directly related to "real-life" situations inherent to work on Mechanical Production.

- The issues of the proposed project are relevant to practical areas of Mechanical Production.

- The interests and needs of the apprentices and the need of the sector/labour market have been considered.

- The defining of objectives, planning, implementation and control should in the greater degree be the responsibility of the apprentices themselves.

- The students/apprentices should learn and work collectively during the implementation out of the project.

By using this method, the students/apprentices should carry out specific activities independently, on both intellectual and practical levels. This project method should combine cognitive, affective and psychomotive learning objectives.

This method and the use of the toolkit should be previously explained in a specific training sessions Trainer's first task is to make sure that students are familiarized.

The toolkit facilitates to develop the project considered by different phases:

Informing and compiling the necessary information

In the first phase, students/apprentices should compile the information needed to solve the proposed problem or need, making use of available sources of information (technical textbooks, specialized publications, manuals, videos, images, etcetera.).

Planning, adapting or changing

The planning phase is characterized by the setting up of the work plan, the structuring of the methodological procedures and the planning of the tools and resources to be used. As simply preparing the work plan does not always guarantee that this will be correctly implemented, in the tools for planning are included methodological instruments to distribute tasks and revise the planning.

Deciding

Tools for collective decision-making involving trainer and group members, because before commencing the practical work phase, students should take group decisions about the alternatives or problem solving strategies to be pursued. They allow to students learn to evaluate the potential problems, risks and advantages presented by each possible alternative.

Implementing

Tools guarantee that creative, independent and responsible activities are carried out and analyzed. The will help students carry out their tasks independently, or through the allocation of tasks, in accordance with their established work-plan, as well as to compare partial results with the initial work-plan and any necessary modifications made.

Controlling

Thanks to the Toolkit, the students themselves will be able to control and evaluate the results of their work. If necessary, they can use too other tools they themselves can developed during the planning stage.

Evaluating

The tools are useful for students to collectively evaluate both the process itself and the results obtained.

2.2 Description of the KPE on line collaborative software

Knowledge Practices Environment (KPE), a basic platform supporting collaborative knowledge creation, that has been previously developed in another EU funded Knowledge Practices Laboratory (KP-Lab) project (see http://www.kp-lab.org) , has been adapted and appplied as shared working environments for projects and assignment. In the Coop-PBL in VET the shared spaces of KPE have been used as the primary working environment for the trans-national project and for the pilot activities as the screenshots below demonstrate.
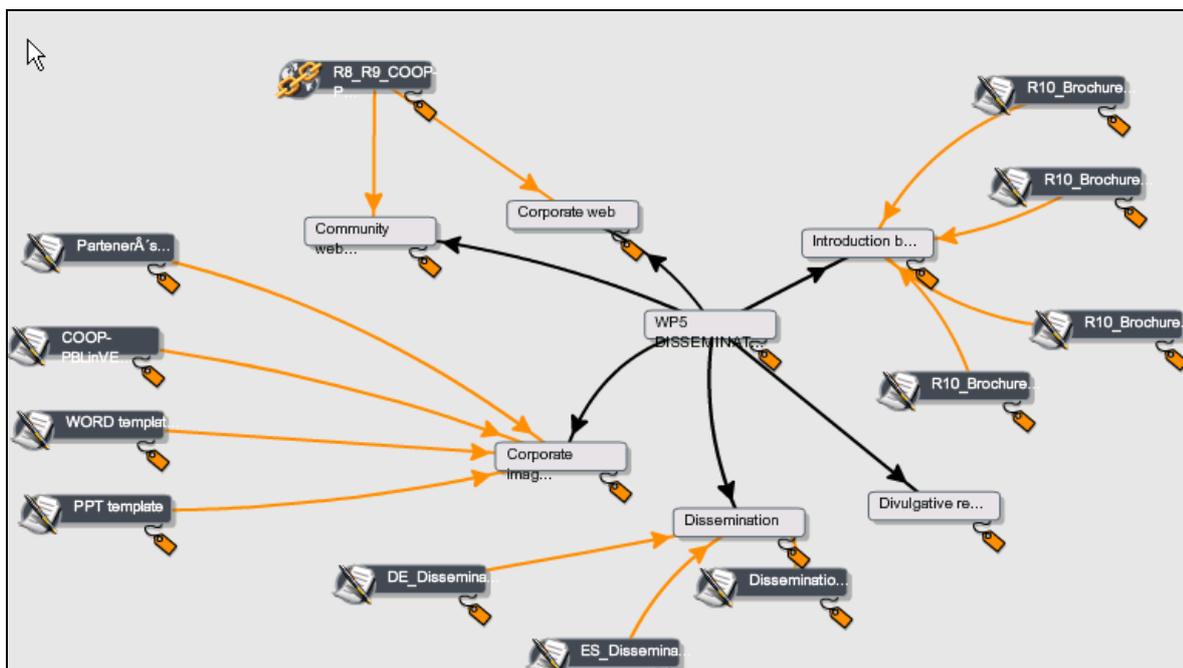
During the project, all the main features of the KPE has been maintained, but other new has been built on, basically related to:

- Improvements in the menus

- Inclusion of a light box in several functionalities

- Language's versions

- Visual improvement in Gantt diagram

- It was solved the problems related to "notes" and copy-paste functions

- Graphical improvements in the user's interface

- A searching function has been included.

KPE enables object-bound and threaded commenting on all items (task items, files, web-links, notes) in a shared space, as well as viewing of knowledge objects and their relations from several perspectives. Three basic perspectives are Content, Process and Community Views. Various tools and functionalities are highly integrated in the basic views to enable versatile and flexible connection, organization and reflection on all information related to the knowledge objects, processes and people concerned.

KPE is designed to mediate various aspects. It provides a shared knowledge space with versatile tools for developing and managing knowledge artefacts, organizing processes and people, and reflecting on practices from several perspectives. Main perspectives consist of the Content, Process and Community views. KPE includes a set of tools (e.g. real-time and history based awareness, note editor, commenting, chat, semantic tagging and semantic search) for working with the shared knowledge objects.

A central view in KPE for working on knowledge artefacts is the Content View that allows free visual arrangement, flexible restructuring, and linking of its content. KPE is not based on folder structures or hierarchical presentation of the content. Instead of providing only a space to store and manage vast number of documents, KPE enables the users to organize knowledge objects (represented by graphical icons) through visual representations. For example, spatial arrangement and linking of items.
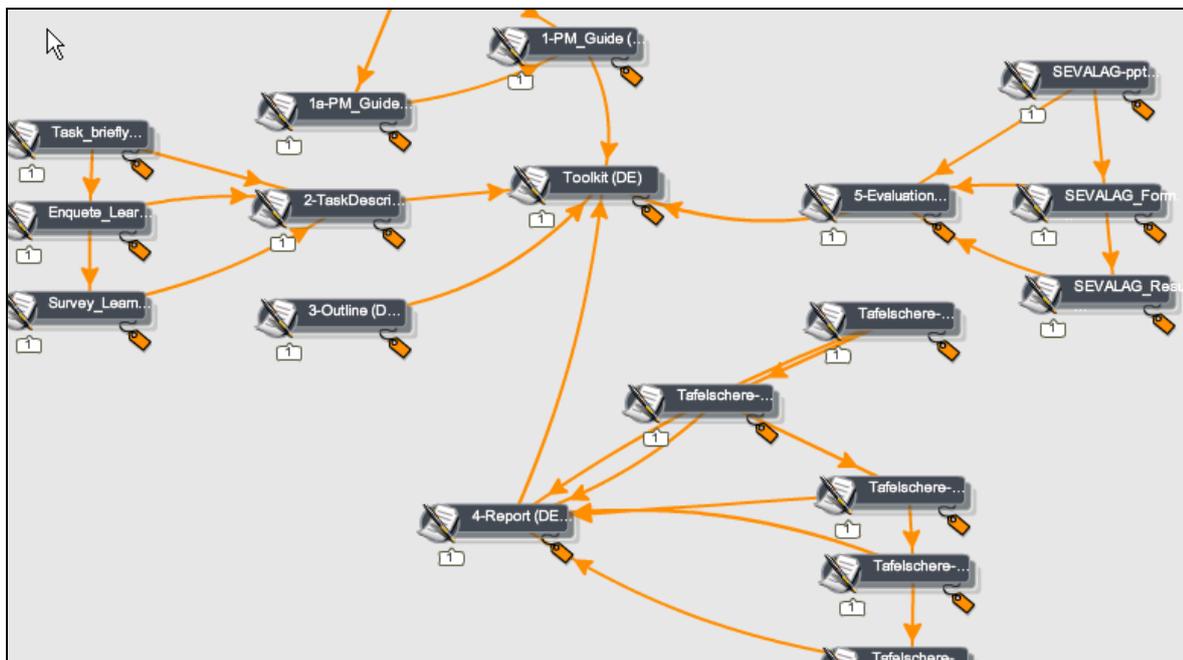
In addition to a possibility to upload files in a Content View, some specific tools are built in or integrated in KPE to support easy production of texts and sketches as well as co-editing and comparison of text versions. With Note editor, users can directly write their ideas and thoughts as content items in a shared space, without the labour of creating and uploading an external text file.

All members of a space can open and edit the created notes and view their previous versions. Furthermore, users can open many notes simultaneously for comparison and integration, and link notes to other content items in the Content View.

In the Content View, object-oriented collaboration is emphasized by content-bound commenting functionality that allows asynchronous, threaded discussions attached directly to knowledge objects. One object can have many comment threads, thus enabling users to discuss various aspects of the objects, directly, in context. This object oriented aspect places KPE beyond isolated discussion forums, threaded notes or argumentative discussion supports, which concentrate on the dialogical aspect of collaboration and so lose the context; KPE answers the need to have individual contributions attached in collaborative work that is organized around shared knowledge objects embedded and embodied in a shared space. Similarly, object-bound chat enables synchronous interchange attached directly in the content items at hand. Chat log is saved and linked to the targeted content item, therefore keeping the log attached to its object for possible re-use and continuation.

In the Content view, all items can be tagged the tags or concepts that users define are implemented in the underlying technology in a way that allows search and filtering using the tags. Such functionalities allow the users to create their own cognitive and conceptual tools and instruments.

In addition to content items, in KPE, users can explicitly define, modify and arrange task items to fit their process and domain, including, e.g., descriptors of title, responsible users, start and end dates, and status. The same tasks that are displayed in the Content View with their relations to content items can be viewed in Process View, (in the form of a GANTT chart) and Alternative Process View (which is based on presenting e.g. iterative processes spatially and semantically).

For each content or task item visible in the Content or Process Views, it is possible to define persons responsible for that item. In addition, a third basic view of KPE, called the Community View, is especially meant to support the coordination of tasks and responsibilities between participants. It presents a list of users with indications who is on-line. Detailed user information includes a list of all tasks and knowledge objects that have been created and modified by or assigned to a particular member. KPE offers means to keep in contact with others, such are asynchronous commenting possibilities, or general chat and context bound chat to enable synchronous discussions.

2.3 The Pedagogical Guide

In this training context, the trainer's role moves from that of a "teacher" simply transmitting knowledge and skills, to one of a learning process advisor, coordinator and supportperson. The trainer should instigate, organize and stimulate the learning situations. The student is led towards self-learning and motivated to plan independently and collectively, and to implement and evaluate the learning process.

The Manual for Promoting Project-and Practice-Based Learning in Vocational Education and Training (VET). It provides short answers to the following questions:

- Why has the value of "learning through work experience" been rediscovered in the recent European educational debates?

- What kinds of approaches to problem-, project- and practice-based learning can be identified and how have they been put into practice?

- What is the role of collaborative learning technologies as support for such pedagogic approaches?

- What kinds of new initiatives and pilot activities can be reported from the participating countries and what lessons have been learned?

The Manual has been prepared as introductory material for vocational teachers, in-company trainers and decision-makers who are responsible for the development of vocational education and training. The Manual gives a compressed picture of current issues and main developments across Europe. The Manual helps the stakeholders (from schools, enterprises and policy bodies) to identify key messages that arise from the work of the European project.

The Manual and its complementary resources are edited in digital version and are on line available in a Moodle Platform in the project website www.coop-pbl.com

3. The context of future use of PjBL based on collaborative Web 2.0 technologies

3.1. The framework

Reports such as "Corporate Recruiters Survey 2007" or the "Fourth Report of the Expert Group on Future Skills Needs 2008" the Irish Institute of Employment confirm that 60% of industrial companies are incorporating into their recruitment processes criteria related with skills, such as teamwork ability, communication, problem solving, learning and self-education, self-management of time or creativity. In the case of Spain, 46% (EOI 2007

The European educational policies are trying to adapt their respective systems to meet these demands. As sample, the Spanish Ministry of Education collected it in his "Roadmap for Training" (2008) which provides vocational training orientations to meet the reality of the labour market and the needs of all students.

The European Parliament also highlighted the importance inclusion of "soft skills" in the European Qualifications Framework in its Resolution on the creation of the MEC (2006/2002 (INI), and the European Commission has foreseen a significant growth in its demand until 2020 (COM (2008) 868 final).

But most European VET schools and education systems have been traditionally only prepared to provide technical skills. This means they must make during next years and important effort to adapt and innovate their teaching methods and training approaches, as outlined in the Commission Communication COM 318 (2000) "e-Learning/Designing Tomorrow's Education" and COM 678 (2001) "Making a European area on Lifelong Learning a Reality "and Resolution of the Council of the EU UE 2002/C 163/01.

At a time in which each new cycle of innovation is increasingly brief, training institutions need to become more versatile and flexible, adapting themselves to the new structures developing in the professions. Internationalization, the globalization of markets and increased competitiveness oblige companies to tailor their products to new technological requirements, productive processes, services and demand for skills. Vocational training must become multipurpose, multifunctional and flexible.

In this context, one of main challenger of vocational training is to provide too flexibility, thus enabling students to benefit from an interactive and self-directed learning process – one with a capacity for continual evolution and occupational re-adaptation.

Project Based Learning and Practice Based Learning appear as methodologies appropriated to provide these soft skills. But traditionally they have been applied in the educational areas related to the sciences of sanitary, engineering, energy, transport, especially in the University engineering level, or in the business promoters training. Scarcely experiences exist in the area of the vocational training, but they can be equally applicable, in view of the technical character of the matters since they facilitate the support and enhance the interdisciplinary and transversal competencies.

3.2. The Project-Based Learning methodology

The project-based learning (PBL) plans to flee the traditional teaching model in the sense that it does not look that students are able to memorize concepts or solve problems (usually individually), but seeks to develop a skills in students so that they can develop their own knowledge in a personalized way by solving a problem in a common way by collaborating in a project's team.

The methodologies of Project-Based Learning (PjBL) stem from methodological innovations provided by the constructivist approach that evolved from the work of psychologists and educators such as Lev Vygotsky, Jerome Bruner, Jean Piaget and John Dewey. Initiated in Canadian and American universities in the 80s (McMaster, Queen's, Harvard, Stamford ...), they have been applied in areas related to sciences of education (medical and engineering courses) or entrepreneurial training (www.teamacademy. fi). The higher education sector in Finland (Kajaan Polytechnic Universities of Jyvaskyla, Helsinki Metropolia) and Denmark also quickly embraced these methods in the 90s, and then stand in application engineering universities in the UK (Univ. of Nottingham, Loughborough and Montfort).

Training based on PjBL are mainly located in Universities and Educational Innovation Centers oriented to higher education. Danish Aalborg University offers one of the Master in PBL methodologies and PJL most famous and is leading a European Working Group that supports the implementation of PBL and PJBL in Universities, sponsored by UNESCO. There are also isolated cases of interest in Eastern Europe, such as the National Association of Language Teachers of Slovenia and the University of Brasov (Romania).

3.3. The Practice Based Learning methodology

The latest developments in education and training shift the emphasis to partnerships and both-sided cooperation between educational actors and work organisations. This is needed at the level of higher education and in the education and training of skilled workers. The key point for shaping project- and

practice-based learning is to bring real life problems to the centre of vocational and professional learning cultures.

The practice based learning has been largely developed in University education in all Europe. But in the case of VET, even if the European framework is orienting all them in the same direction, the approach related to practice system is very different by countries. Each system gives different educational frameworks, in which the role of companies and VET School is very different concerning the VET practices. Different conceptions about the way in which students acquire competences generate different methods and procedures to carry out these in each country.

In the case of Spain, PjBL is being recently included in high VET level courses. In this case, the curricula are very closed and given by the Regional Educational Authority (Basque Government). But the idea is to improve their educative richness by providing transversal skills:

- Creativity

- Team work

- Communication skills

- Self-discipline

- Organization skills

- Problem solving

- Self learning

In all degrees it is compulsory for each student to accomplish 360 hours of job practices in an industrial company, from march to June, seven hours by day. At the same time, the students shall develop a Project (depending the speciality) that will take 50 hours.

In this case of Hungary, the VET educational model is modular. Each student can compose he/she is own curricula. If he/she wants to change the speciality, he/she can complete the missed modules. This system it is very interesting in the case of specialities belonging to the same family – f.e. mechanical/electrical - because in this case they have common modules, and are complementary.

Secondary vocational schools offer the opportunity to learn a profession and provide general education as well. In the 9th–12th grades, students are taught mainly general subjects. This is a preparatory phase for the secondary school-leaving exam and further studies. The vocational orientation

starts in the 9th grade. From the 11th grade on, theoretical and practical basic knowledge is taught in workgroups. The real vocational training begins only after the secondary school leaving exam (ISCED 4). Students complete their studies with final exams in the prescribed vocational subjects.

College basic and supplementary programs (ISCED 5).These programmes are offered by cooperating with secondary vocational schools for students with a secondary school leaving certificate. During the training students get credit points, which are taken into account when they apply for places at universities and colleges. But practices in companies are not compulsory. Students only have to pass the exams to have the certificate, but the exams have an important practical part. It is possible for them to participate in practices programmes organised by VET schools, but they are not remunerated. Then, students prefers to arrange by their side paid stages in enterprise. But in these cases, VET schools are not involved.

The VET German context is the Dual System, where apprentices are learning basically by working in companies, and VET Schools give them only complementary support (1 or 2 days of 5 by week). The corresponding Lander are managing and controlling this system in each region. Companies are responsible of the apprentices learning, and have the heavier role in the process, and VET school are only a provider of training services for them. It is a very good system for companies to have very good prepared workers, but the system follows more the criteria and needs of companies. But for apprentices, could mean a lack of other competencies (p.e. transversal) or more difficulties to change their speciality profile.

Due this situation, now is a moment of a re-thinking and of a reallocation of responsibilities of vocational schools. A process of Re-establishing the cooperation of vocational schools with new sets of partner enterprises has been launched. In this context, the COOP-PBLinVET Project results could be integrated in the future in the Dual System, and could be an opportunity to involve more companies with VET Schools.

3.4. The new role of VET teachers

In this framework, the role of the VET trainers should not be limited to the transmission of the theoretical knowledge. Trainers must turn into facilitators, designers and learning advisors, and provide support for the learning process that is in constant relationship with enterprises.

The trainers must follow/track, orient and coach the students, facilitating the most active participation. Trainers must instigate, organize and stimulate learning situations

Apprentices are led towards self-learning and motivated to plan independently and collectively, and to implement and evaluate the learning process.The support and monitoring by companies' representatives in the Practice Based Learning must be ensured too.

The changes in the VET teacher's role will be related with:

- to prepare deeper the learning process.

- to remain in the background as much as possible, just taking note of what works and what doesn't.

- to be on hand in order to answer questions

- to encourage students to learn for themselves and to formulate "correct" questions.

- to encourage students to selfevaluate their work and experiences

- to enable "the forgotten" to be remembered and, develop with students the corresponding technical theory based on practical experience.

- to pay special attention to the areas of cooperation, organization of tasks and group or teamwork methodology, addressing them through conversations with the students.

The collaborative learning technologies are being developed to support and facilitate this kind of learning process. By relaying and communicating participation and knowledge creation are facilitated among the VET trainers, VET trainees and enterprise representatives. In addition, support and affordance for appropriating the transversal competences related to self and shared learning; collaboration, researching or creativity is provided when facing authentic problems.

4. Analyse of CooP PBL in VET sustainability

A reflection about the possibilities to maintain, use and put in value the results, product and outcomes has been developed in the partnership of Coop PBL in VET during the 4th and 5th transnational meetings of the project. In order to systematize and collect the different positions of the partners, a common Sustainability Questionnaire has been developed and fulfilled by the partners. It is considering different aspects related to the products and results as well as future expectations and willing. It is reproduced in the next pages, as well as the feedback of partners.

4.1. The Sustainability Questionnaire

1. Pertinence and quality of results					
Please rate the pertinence and success of the results and achievements					
	1 **Very bad**	**2** **Bad**	**3** **Fair**	**4** **Good**	**5** **Very Good**
In what level the obtained results are pertinent to the main objective of the project?	☐	☐	☐	☐	☐
In what level the products, activities and results of the project meet your corporate partner expectations?	☐	☐	☐	☐	☐
In what level the didactical final products and other results accomplish your personal expectations?	☐	☐	☐	☐	☐
How would you personally assess the level of information and experience gathered with the implementation of Work Packages?	☐	☐	☐	☐	☐
How do you appraise the match between the expected results, the invested resources, and the goals/outcomes achieved?	☐	☐	☐	☐	☐

Please, rate your general opinion on the achievement of the main products					
R1: Comparative analysis of the educational contexts of the transfer's receivers and the specific requirements to implement PjBL /PBL and the KPE."	☐	☐	☐	☐	☐
R2: Joint report of "Conclusions of transfer possibilities and the framework of this transfer"	☐	☐	☐	☐	☐
R3: A Pedagogical P&PBL Toolkit (Spanish, German and Hungarian integrated in KPE System.	☐	☐	☐	☐	☐
R4: Adapted KPE and User's Manual	☐	☐	☐	☐	☐
R5: A Trainers Guide	☐	☐	☐	☐	☐
R6: Common Report of Results of Experimental Implementation	☐	☐	☐	☐	☐
Please, rate the global quality of the Pedagogical P&PBL Toolkit					
Contents	☐	☐	☐	☐	☐
Structure	☐	☐	☐	☐	☐
Graphical layout, edition and "communicational interface"	☐	☐	☐	☐	☐
Usability	☐	☐	☐	☐	☐
Usefulness	☐	☐	☐	☐	☐
Possibilities to be adapted to different contexts and adopted by others.	☐	☐	☐	☐	☐
Please, rate the global quality of the KPE and User's Manual					
Contents	☐	☐	☐	☐	☐
Structure	☐	☐	☐	☐	☐
Graphical layout, edition and "communicational interface"	☐	☐	☐	☐	☐
Usability	☐	☐	☐	☐	☐
Usefulness	☐	☐	☐	☐	☐
Possibilities to be adapted to different contexts and adopted by others.	☐	☐	☐	☐	☐
Please, rate the global quality of the Trainer's Guide (All Moodle system)					
Contents	☐	☐	☐	☐	☐
Structure	☐	☐	☐	☐	☐
Graphical layout, edition and "communicational interface"	☐	☐	☐	☐	☐
Usability	☐	☐	☐	☐	☐
Usefulness	☐	☐	☐	☐	☐
Possibilities to be adapted to different contexts and adopted by others.	☐	☐	☐	☐	☐

Strong and weak sides

In general, which strong sides of achievements and outcomes would you mention?
In general, which weak sides of achievements and outcomes would you mention?
What do you think are the main opportunities and threats given by the project?

Benefits

Could you express the main benefit you consider have the results of the project for your entity, at corporate level strategies?
Could you express the main benefit you consider have the results of the project for the VET students?
Could you express the main benefit you consider have the results of the project for the VET teachers?
Could you express the main benefit you consider have the results of the project for your educational sector /environment?

2. Interaction – Innovations

Do you consider you and your entity have gain added value with your participation in the project? Detail please.
Did the project and their results have any specific impact in your entity? Please, detail.
Did the project and their results have any specific impact in the targets and educational environment of your entity? Please, detail.
What kind of formal or informal feedback (relevant to the project) did you experienced during the project implementation from actors in the field (users, enterprises, VET centres, governments and policy makers....).
Which new aspects, approaches, tasks, ideas do you think have emerged during the project realisation – in comparison with the initially used ones?
On basis of your experience, what kind of interrelations, synergies could be observed with other similar initiatives during the project development?

5. Lesson Learned

In your opinion, what could be the lessons learned during the development of the project?
In your opinion, what are the points you have appreciate more during the development of the project?

3. Exploitation possibilities

Do you think the developed products, outcomes and results could be included in the teaching activities of in other training purposes of your entity?	☐YES	☐NO
If yes, please describe how could be. If not, please explain the reasons:		
If yes, please list the main advantages you consider have the project's outcomes to be used by your entity in the future.		
Do you think the developed products, outcomes and results could be included in the teaching activities, learning objectives, targets of other external third entities?	☐YES	☐NO
If yes, please describe what kind of targets and entities could be interested in the project results.		

Please identify issues/ factors that may cause difficulties in the future use of the didactical product, in your entity or in thirds.
Please identify future needs in terms of changes and resources (infrastructure, expertise, technology, developments, advertising, etc.) you think could be necessary to use and maintain the results or to exploit them.
What are the interests of your entity related to copyright and intellectual property?

6. A look forward –Sustainability actions
What kind of future actions would you find relevant in related to the valorisations/exploitation of project results?
What would you propose concerning potential continuation/extension of the project?
What would you propose concerning potential continuation/extension of the partnership in related projects?

4.2. Partner's Feedback about the sustainability

1. Pertinence and quality of results						
Please rate the pertinence and success of the results and achievements						
	1 Very bad	2 Bad	3 Fair	4 Good	5 Very Good	Average From1-5
In what level the obtained results are pertinent to the main objective of the project?	☐	☐	1	4	1	3,5
In what level the products, activities and results of the project meet your corporate partner expectations?	☐	☐	☐	5	1	4,1
In what level the didactical final products and other results accomplish your personal expectations?	☐	☐	1	3	2	4,1
How would you personally assess the level of information and experience gathered with the implementation of Work Packages?	☐	☐	☐	5	1	4,1
How do you appraise the match between the expected results, the invested resources, and the goals/outcomes achieved?	☐	☐	☐	4	2	4,3
PERTINENCE AND QUALITY TOTAL EVALUATION						4
Please, rate your general opinion on the achievement of the main products						
R1: Comparative analysis of the educational contexts of the transfer's receivers and the specific requirements to implement PjBL /PBL and the KPE."	☐	☐	☐	5	1	4,1

	1	2	3	4	5	Score
R2: Joint report of "Conclusions of transfer possibilities and the framework of this transfer"	☐	☐	☐	3	3	4,5
R3: A Pedagogical P&PBL Toolkit (Spanish, German and Hungarian integrated in KPE System.	☐	☐	1	3	2	4,1
R4: Adapted KPE and User's Manual	☐	☐	2	3	1	3,8
R5: A Trainers Guide	☐	☐	1	4	1	4
R6: Common Report of Results of Experimental Implementation	☐	1	3	2	☐	4,1
DELIVERABLES TOTAL EVALUATION						**4'1**
Please, rate the global quality of the Pedagogical P&PBL Toolkit						
Contents	☐	☐	☐	2	4	4,6
Structure	☐	☐	☐	4	2	4,3
Graphical layout, edition and "communicational interface"	☐	☐	2	4	☐	3,6
Usability	☐	☐	☐	6	☐	4
Usefulness	☐	☐	☐	5	1	4,1
Possibilities to be adapted to different contexts and adopted by others.	☐	☐	1	5	☐	3,8
PEDAGOGICAL P&PBL TOOLKIT TOTAL EVALUATION						**4**
Please, rate the global quality of the KPE and User's Manual						
Contents	☐	☐	2	1	3	4,1
Structure	☐	☐	2	1	3	4,1
Graphical layout, edition and "communicational interface"	☐	☐	3	2	1	3,5
Usability	☐	☐	2	3	1	3,8
Usefulness	☐	1	2	2	1	3,5
Possibilities to be adapted to different contexts and adopted by others.	☐	☐	2	4	☐	3,5
KPE AND USER'S MANUAL TOTAL EVALUATION						**3,75**
Please, rate the global quality of the Trainer's Guide (All Moodle system)						
Contents	☐	☐	☐	4	2	4,3
Structure	☐	☐	☐	4	2	4,3
Graphical layout, edition and "communicational interface"	☐	☐	1	5	☐	3,8
Usability	☐	☐	2	3	1	3,8
Usefulness	☐	☐	☐	4	2	4,3
Possibilities to be adapted to different contexts and adopted by others.	☐	☐	1	5	☐	3,8

TRAINER'S GUIDE (ALL MOODLE SYSTEM) TOTAL EVALUATION	4
TOTAL EVALUATION	3,97

Strong sides

- The experiences that were acquired by Mai and the way these were transformed into practices, manuals and visually strong guidelines and handbooks.

- The project was based on the assumption that PBL (problem-, project- and practice-based learning) could be seen as a highly coherent Europe-wide set of reform ideas and change agendas. This is more the case with Higher Education but with VET there is a need to get the ideas grounded in the national VET cultures. In this respect the partners made serious efforts to develop key activities and support materials to get the ideas grounded.

- Equally, the project expected that the KPE software would provide a common framework for shaping pilot activities across Europe. Here again, the use of software and web applications has to be derived from the VET context. The partners tried to link the use of KPE and other web applications to new pilot activities, training of teachers and trainers and to mutual learning with parallel projects. The fact that this work has been documented in different ways – written reports, contributions to moodle, podcasts and video clips – has provided European added value.

- The project facilitated to obtain good materials, with high quality, to be used in any project based training experiences in other VET branch.

- Transfer has been successful. Adoption of the pedagogical approach and the new technology has been very successfully done especially in the Spanish pilot.

Weak sides

All of the partners did not execute the same amount of work with the same drive for quality

- The project concept overestimated the transferability of PBL-ideas into different VET contexts and at same time underestimated the efforts that were needed to launch pilot activities across Europe. In this respect the achieved level of activity (including local projects, local training measures and local dissemination activities) is already very respectable for a transfer project. In a similar way the project concept overestimated the transferability and adaptability of the KPE software environment for complex VET projects that involve multiple organisations (both

vocational schools and enterprises). So far, successful adaptation has taken place in strong VET schools (like MAI) but wider adaptation has been problematic.

- Finally, the project was not in the position to anticipate the rapid transition from holistic multi-purpose software environments (like KPE) to networked use of dispersed applications and services (in the style of Web 2.0, now that it has become everyday life practice).

- The degree of involvement of the partners has been very different, due national constraints in terms of different VET systems, different degree of the adoption and use of TICs in VET training and different level of culture of innovation of VET teachers.

- KPE was a tool no easy to use initially and the method of collaborative net e-working was really so new in VET environments, in all the participating countries.

  - To apply PBL and KPE take much more time to prepare materials for students, but if it is ready much more convenient, than the traditional way of teaching.

  - The piloting could have been more extensive, but VET educational context impeded it very much.

  - The web technologies used in KPE are becoming outdated and their maintenance is problematic.

Opportunities and threats

The main opportunities considered by partners have been:

- to make transparent the pedagogic work (concept development during the preparation of different deliverables, videos etc and the efforts to put the ideas into practice). The project is an important pilot in getting a deeper understanding, what 'transfer' of innovative ideas really requires from actors in the field to get new ideas properly grounded.

- to work together in common teams /students-teachers, stakeholders/

- to obtain more practical knowledge about social and ICT competences for teachers and students-

- to collect and use new methods in VET education

The main threats considered by partners have been:

- to get stuck with a simplistic idea of 'transfer' as transportation of ready-made ideas and tools from the original context (e.g. higher education) to a new and more complex context (e.g. VET). The risk that I see here is that the above mentioned achievements in "grounding" are belittled and the main emphasis is given on 'transfer' of ready-made ideas and tools (as such).

- to ensure the sustainability of the particular technology used in the pilots, due taht KPE has been developed several years ago and the advancement and evolution of TICs and Internet technologies are requiring to update or renovate this tool.

- the need to make previously VET teachers know more about the PjBL methodologies and the potential use of collaborative technologies in training, and to gain them to try this kind of experiences with students by increasing their awareness to improve didactical methods and to incorporate TICs in training.

Benefits

Main benefits highlighted by partners related to their own entities have been:

- To have established new contacts, new insights and possibility to exchange didactic about practices of didactic methodologies.

- This project has given rise to series of interviews and exchanges between parallel projects that

    a)   promote project-based learning in vocational schools,

    b)   develop interactive platforms for apprentices,

    c)   develop teachers' aid for producing user-generated content (by teachers and learners) and

    d)   promote the use of ICT and web resources to support (informal) learning in SMEs. In this respect the possibilities of this project were discovered at a late moment but nevertheless they will be utilised more consequently in the final phase of the project.

- The project provided the way to exploit the results of previous EU funded R&D work, and gave new insights into the sustainability of the software solutions developed in the R&D projects (in this case, related to Metropolia).

- The project provided a strong pedagogical approach and the supports developed for it.

- The opportunity to experiment with e- learning methodologies both for VETstudents and teachers.

Main benefits highlighted by partners related to VET students have been:

- The reflection and potential to renew practices. The possibility to see different perspectives has enabled to see the needs, potentials and adaption possibilities of different practices, evaluation methods etc., and abilities to execute them.

- The main pilot activities in the Bremen region are run by the parallel projects with focus on project management and project-based learning and on developing a platform for apprentices. The experiences of the Coop-PBL in VET project (analyses and pilot activities) serve as point of comparison for specifying the success factors and shortcomings. In particular this is the case with stimulating active participation and in overcoming the problems with insufficiently user-friendly tools and applications.

- The project has offered new perspectives about the potentiality of daily using new ICT technologies in vocational education-

- The project provided good materials to be used with students.

Main benefits highlighted by partners related to VET teacher have been:

- The opportunity to reflect about to improve didactic methods and the daily use of ICT in vocational education.

- The experiences of Coop-PBL project serve as point of comparison. In the light of this project and parallel projects, there appears to be a wide gap between enthusiastic pioneers and more reserved 'traditional teachers'. In this respect the project has brought into picture different innovative practices to promote wider teachers' involvement in project-based learning, uses of ICT and Web resources and getting active in producing user-generated content.

- The availability of new materials and e-Collaborative ICT obtained as results of the project.

In the case of educational sector, the main benefits expressed were:

- The opportunity to renew values and more up-to- date practices. What this could mean for environment is way too broad a question to answer after two years.

- For the moment the work with PBL and uses of collaborative learning technologies has been promoted at a highly generic level (projects based on Higher Education or general schools have dominated). As a contrast, the pedagogic development of VET has not been addressed in such project designs. In this respect there is a need for specific projects on VET. However, also in such projects there is a need to compare and cross-fertilise experiences from different domains in vocational teaching and learning. In this respect the involvement of wider range of parallel experiences and testimonies has been adequate.

- Gaining knowledge on the practise of implementing PBL in other sector (VET).

- The result of an experience on transfer of the pedagogical approach and technologies developed in higher education to VET.

- Learning in practise to collaborate between Universities and VET organisations.

- The results of project show the opportunities and potential of the daily use of new ICT technologies in Vocational Education

Innovation

The added value of the project considered by partners was perceived as follow:

- The project has given rise to series of interviews and exchanges between parallel projects that:

    - promote project-based learning in vocational schools,

    - develop interactive platforms for apprentices,

    - develop teachers' aids for producing user-generated content (by teachers and learners) and

    - promote use of ICT and web resources to support (informal) learning in SMEs.

The exchanges and interviews have proved to be very useful and revealed a gap in knowledge sharing on work in progress. There is a need to organise such knowledge sharing activities on a regular basis.

- The project gave the opportunity to experiment on new didactic approach with teachers and students and obtain learned lessons and conclusion for future didactic innovations.

- Partners obtained a better knowledge about vocational education system and different VET situation in partner countries, and about new technologies available useful for this kind of education.

- A further development and maintenance of KPE as well as improving the training and support resources for it has been obtained.

- The collaboration between University and VET sector and knowledge about applying PBL and new technologies in another sector.

- New valuable contacts and insights have been provided.

The specific impact the partner entities have been:

- Due to the Coop-PBL in VET project the institute (ITB) has had more exchanges between projects that focus on problem- and project-based learning in VET and on project management training in vocational schools. In a similar way there have been exchanges with projects that focus on development and utilisation of collaborative learning technologies. These exchanges have provided a basis for some video interviews for Coop-PBL in VET.

- The opportunity to improve and updating training materials used in VET.

- The opportunity to include innovative training in competences related to common team work.

- •Having obtained means to analyse the web technologies for PBL which has lead to a decision to re-engineer KPE in order to guarantee its sustainability.

The identified impacts of the project in the targets and educational environment have been:

- The inclusion of the use of ICT in practical education of metal industrial skills.

- Obtaining lessons from pilot activities with PBL-initiatives and with collaborative learning technologies (with KPE or with alternative solutions) that will be studied carefully in the framework of new major educational projects in this field, in which some partners are involved or will be involved in the future.

- What kind of formal or informal feedback (relevant to the project) did you experienced during the project implementation from actors in the field (users, enterprises, VET centres, governments and policy makers).

The main feedbacks received by partners were:

- The contact persons who have been promoting project-based learning and project management training in vocational schools were interested in the KPE software architecture but pointed to the fact that the general trend is moving from 'big package' solutions to networked applications and services. They were mainly interested in solutions that supported more directly domain-specific learning initiatives.

- To discover a different concept of collaborative technology that could be used as complement of more common e-learning technologies, as Moodle.

- New perspectives for the design of adaptations and the maintenance of KPE, that were done in continuous collaboration with the users in the VET sector. Several inquiries from other educational institutions on the KPE were received.

- The received feedback of KPE's benefits in different educational levels was highly important to better evaluate the real benefits the tools provide for future development and adaptations of this one or similar tools.

New ideas emerged during the project were related to:

- Suggestions and ideas related to the improvement and sustainability of the KPE due to the software technology development for web applications (see more below).

- The idea that of the use of ICT could reinforce the training practice in metal industrial skills by providing new soft skills.

- The partners were working in different circumstances and VET cultures. Therefore, the written reports (for the transfer framework) could only partly contribute to mutual understanding (= learning to know the boundary conditions and challenges for each other's

initiatives). At a later stage the project learned to use video material (in original language and international language) as means to promote knowledge sharing. This is clearly a pattern worth developing further in such transfer projects.

Related synergies and interrelations have emerged too during the project, it can be said that:

- Given the difference of starting points in the participating countries, the project could not profit that much of direct synergies between partner institutes and networks. Instead, each partner was working with a somewhat different pilot agenda. However, the collaborative work packages (transfer framework, pedagogic concept including toolkit and moodle, the work with the KPE environment and the work with video material) helped the partners to understand each other and to provide mutual support.

- VET partner have discover a more interactive possibilities of e-learning methods, and a clear need to develop better technical environment to support PBL in vet.

- The experiences of use of KPE have provided a way how new free ware and open source tools could be used to potentially cover and evolve further the best ideas of KPE.

Related to Lesson Learned, partner considered:

- The main lesson is that 'transfer of innovation' should not be seen as transplantation of good practice from model countries to receiving countries or as mere implementation of agreed ideas into practice (in terms of 'one size fits all' or 'one format fits all'). The experience of Coop-PBL in VET shows (once again) that transfer projects can best work as 'transfer forums' in which the partners are working with similar innovation agendas and share experiences how different parts of the agenda can be put into practice in their VET contexts.

- In the case of VET Centers, they have learned more about Project Based Learning Method (not used until now in their training activities) and stimulate a reflection about how to implement it in VET practices in the future.

- The differences in educational cultures are a significant barrier for transfer of results from one country to another.

- The main focus should be on practices and methods rather than on technology, although the technology can be a critical factor in the implementation of a particular pedagogical method.

- The transfer of a specific, not widely used technical platform is a very difficult task, as it hard to motivate the new users to adopt it.

- The EU funding schemes are lacking feasible and easy means to support the sustainability of the technical solutions developed in R&D projects

- The Co-operation, value of different teaching and evaluation practices in different environments

The more appreciate points appreciated during the project development have been:

- With the founding activities and respective deliverables (transfer framework, pedagogic concept, toolbox, pedagogic manual, Moodle etc.) the transnational project provided coordinates for the partners to locate themselves into a network of initiatives and change agendas.

- With the help of the video materials and virtual community the transnational project provided an opportunity to share thoughts and experiences (within the project and more widely). These both possibilities could have been utilised more consequently from an earlier stage onwards.

- The collective, easy going and productive atmosphere that the contractor was able to establish right from the first meeting.

- The professional management and coordination of the project.

- The interculturatlity: having the opportunity to know different cultures, specially Basque one.

Future exploitation

Related to future exploitation, all the partners agreed that the obtained products and results could be used in future training activities in their respective entities or similar others

Given the transitional situation in which the development of PBL-concepts and collaborative learning technologies is heading from 'big package' solutions towards more user-and context-oriented tutorials, the work of the Coop-PBL in VET appears as 'earlier generation prototyping'. In this respect it is worthwhile to make comparisons with parallel activities (e.g. the TACCLE and TACCLE2 projects) for shaping the follow-up activities.

VET Centers, both have other training specialities where Project Based Learning and KPE could be used, as wooden industrial, tourism or environmental protection. In the case of MAI, PBL must be compulsory included in all kind of VET training cycles, due its Regional VET System has been recently been updated to include it.

KPE and the training materials are directly applicable in the project-based courses in Metropolia, in technical training activities of higher education. KPE could be also used in other collaborative and social learning scenarios and adapted to be included as facilitator tool in other teaching activities.

According above mentioned points, the main advantages of future use of the project's outcomes by the partner entities seems to be:

a) working with an innovative pedagogic concept and having the opportunity to prepare standard and unified materials to teach by using PjBL and

b) working with software solutions support for the implementation of pedagogy in practice. In this context the project has given a voice for teachers and learners in the field. KPE provides baseline implementation of a web environment that supports collaborative learning, but the main stream web environments provided by the university was not suitable at all for such a pedagogical approach, which is used more and more by teachers. This conclusion has motivated to rethink about this tool and how could be improved and better adapted to these need.

Concerning the possibility to transfer in the future the results to third entities, partners considered it feasible because PjBL is widely used pedagogical approach in all levels of education and it is each time more extended in VET education and it can be said that is a increasing tendency.

But partner are conscious that such kind of transfer can not be assumed –one-to-one transplantation of model practice or ideas. Therefore, further use of the results is more likely to happen in the next generation innovation projects that learn from the transitional experience of this project.

But several factors that may cause difficulties in the future use of the didactical product have been identified:

- The Coop-PBL in VET project was not conceptually prepared to deal with such differences in the VET contexts (regarding the implementation of PBL-ideas and collaborative learning technologies) as were experienced during the project. Also, the preconditions for vocational schools to implement project- and practice-based learning (together with enterprises) vary to great extent (and even greater extent when new countries are involved). Furthermore, the

transition to further domain-specific models and initiatives requires more pedagogic support than could be provided by the materials and tutorials of the project.

- KPE –if it is not a free tool and need technical support.

- The fast change in the technologies used in KPE results in difficult maintenance of the system.

- It is difficult to find a growth path for software developed by a EU funded R&D project.

The future needs in terms of changes and resources (infrastructure, expertise, technology, developments, advertising, etc.) that partners think could be necessary to use and maintain the results or to exploit them are:

- The Coop-PBL in VET cannot be based on transferring the general concepts and the software environment (KPE) as such. Instead, there is a need to go into more specific applications of project- and practice-based learning in different domains of VET and into the use of networked applications of collaborative learning technologies.

- KPE should be ported to use the state-of-art software technologies/frameworks. It should be open enough environment to freely test and adopt different social media and open source tools. In addition, There is a need for expertise and instruments that support the exploitation of technical solutions that have resulted from EU funded projects.

- The culture of the institution, school or company willing to use these results, should be future oriented in the sense of allowing bottom up practices to be tested and former/developed further.

The interest of the partner entities related to copyright and intellectual property was basically in sharing knowledge with reference to Creative Commons licenses. KPE has been developed on free software basis.

As future actions to valorisate or exploit the project have been proposed:

- Continue and increase de dissemination of results and products in social media.

- Continue reporting and describing how the practices evolve, what tools will be adopted into use later on and what affordances, features and functions are good in these tools in relation

to the wanted practices and values. This discourse could be active in the created site, Vimeo, Twitter etc.

- To present the results in sectoral and educational Conferences

- To create a basis for a follow-up project that makes use of the pedagogic groundwork of the Coop-PBL in VET but is more open for different occupational sectors and for different uses of collaborative learning technologies.

Finally, several potential extensions of the project and partnership have been suggested:

- Extension for re-engineering of KPE to update it to the era of social media and the state-of-art software technologies.

- Further reporting on the continued renewed practices adapted, feedback on them and especially the tools used and what issues in these tools resemble the features and functions of KPE.

- It would be nice to have a project where the pilots would be extended to become more widely used approach in the VET schools.

- A follow-up project that draws upon the Coop-PBL in VET project (inasmuch as it addresses the context of VET and gives voice for active teachers and trainers as pedagogic actors) and upon the TACCLE projects (inasmuch as they provide support for using web resources and creating user-generated content by teachers and learners).

- To try to involve partners from different organisations (that would bring together the strengths of Coop-PBL in VET and of the TACCLE projects).

General Conclusions

In global, partners seem to be satisfied with the results of the project, due the majority of averages of their evaluation concerning the pertinence and success of the achievements and the quality or products are around 4 points (from 1to 5), it is said "Good", and the average of all this aspects, is 3,97. Then it could be said that the quality of products, considered one of the prior factor to ensure de sustainability, have been accomplished-

The implementing was more complicated than previewed, due the lack of technological knowledge of VET teachers, of habitude to use work collaborative tools in VET training, the small experience in PjBL methods in VET in the case of Spain and Hungary, and just the opposite in the case of Germany.

The constraints du the different VET national systems (official programs), that are not so flexible to experiment and introduce new methods, especially in Hungary and Germany.

The lack of resources, in terms of time and teachers with disposal to try new training methods was an important handicap.

The most innovative point was the use of collaborative technologies to support PjBL.

The project concept overestimated the transferability of PBL-ideas into different VET contexts. Successful adaptation has taken place in strong VET schools (like MAI) but wider adaptation has been problematic. Finally, the project was not in the position to anticipate the rapid transition from holistic multi-purpose software environments (like KPE) to networked use of dispersed applications and services (in the style of Web 2.0, now that it has become everyday life practice).

September, 2012