Transnational analysis for mobility implementation at Metal companies

March 2014

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1. Introduction

Europe is living a stage of great changes, provoking a sectoral and occupational restructuring in the Metal Sector: there is qualification tension in emerging sectors, with scarce offer of qualified manpower and other sectors with high rates of unemployment in groups of low-qualified workers and an increasing requirement of qualification for the replacement of the vacancies (qualification to be achieved on new learning concepts based primarily on skills training).

At the same time the globalization and technology are transforming the way the economy works, so increasingly easy and rapid access to the Internet - including via ever more sophisticated mobile devices - is having a significant impact on education and is beginning to challenge more traditional modes of teaching and learning. [1]

The opportunities brought to education by technology are unprecedented. New online tools and resources enable learners and workers to be active co-creators of knowledge and to collaborate with their peers, wherever in the world they may be. They can access knowledge from any place and at their own pace, whether studying full-time or combining study with work or any other activity. Such a potential might be exploited also to face skills mismatch and shortages, to ensure an improved human resources management and to support small and medium sized enterprises in identifying needed skills and providing training[2].

Therefore it is necessary to act firmly on the relation between training and labour market to progress realistically towards the so called Knowledge Society, while there is an increasing requirement of qualification for the replacement of the vacancies.

In these circumstances the job mobility becomes an effective training tool to meet these changes. However, mid-term studies show that despite the efforts of all EU initiatives, workers mobility do not increase as expected. In fact, intra-EU labour mobility is relatively low when compared to the size of the labour market and the active population of the EU. Annual

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[1] Open Educational Resources and digital learning, Presidency Discussion Paper, Annex to Open Educational Resources and digital learning - Policy debate (Public debate pursuant to Article 8(2) CRP [proposed by the Presidency]), n. 15591/13, 6th November 2013

[2] World Economic Forum Global Agenda Council on Employment, Matching Skills and Labour Market Needs: Building Social Partnerships for Better Skills and Better Jobs, Davos-Klosters, Switzerland 22-25 January 2014

mobility within the former EU27 is 0.29%, below the rates of Australia, (1.5% between 8 states) and the United States of America (2.4% between 50 states)[3]. Only approximately 7.5 million of the European labour force of around 241 million (i.e. 3.1%) is economically active in another Member State[4]. At present high unemployment rates in some Member States coexist with high numbers of open vacancies in others.

In this scenario and based on the practices developed in the academy cooperation for transnational learning, the **virtual mobility** plays a supporting role to improve training of the adult population, integrated in the labour world and to enhance workers' up-skilling, in the context of quickly changing labour markets.

MeVeL partnership encourages virtual mobility adaptation to job places, applied to Metal workers, to allow them undergo sector changes taking advantage of the knowledge acquired in previous trainings and jobs, as well as to allow them to move from low-qualified jobs to others requiring higher skills level with in the same sector, thus providing higher added value to their performance.

In MeVeL project framework we have defined "**Virtual mobility**" like:

Learning activity in the distance (not physical) in order to share experiences, information and knowledge between professionals within an international context; taking into account that:

-this exchange can be done among workers located in different contexts and places or between a training center (VET center) and workers;

-it includes also a learning activity, not only limited to the exchange of professional experiences (telework)

And the core professional category in which we are going to focus the research is the: **"Production Managers and Engineers bearing controlling" responsible.**

As with anything new, Virtual Mobility poses challenges too. How can it best be exploited? Did the state of art advanced since the first report on virtual mobility practices in Europe5? Can it be combined with more traditional forms of teaching and learning, and if so, how? What are

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[3] OECD: Economic Survey of the European Union 2012
[4] This figure excludes workers residing in one Member State and living in another (cross-border workers)
[5] Europace IVZW, European Cooperation in Education through Virtual Mobility, A best practice Manual, Heverlee, 2006

the implications for companies training, aside from higher education? And the implications for the trainers education? How do we assess and validate any knowledge, skills and competences acquired? And not least of all, how can their quality be evaluated?

MeVeL project will contribute to answer to these questions, through a theoretical and empirical approach. This report we present below, in the initial stage of the project, aimed at researching the state of the art, key strengths and weaknesses and main obstacles regarding the Virtual Mobility, specifically in Spain, Turkey, Austria and Italy, by using available tools and series of surveys and questionnaire.

The approach, defined at partnership level and adapted in Italy, considers:

1) A first investigation to collect experiences adopted by companies or training centers to favour the virtual mobility in partner countries, particularly in SMEs;

2) Three in-depth interviews with metal companies to define the importance of the virtual mobility for the SMEs and the main problems manufacturing SMEs encounter when managing the virtual mobility methodology;

3) Investigation of workers´ point of view concerning virtual mobility through questionnaires.

The final aim is to prepare Analysis and Recommendations for metal enterprises, especially for the production line management on regulations necessary to implement virtual mobility.

2.Contextual considerations:

2.1. Context of use

It is common in the four researches, that most of the experiences using this kind of methodology are within the training field, not productive and, more concretely, in the field of higher education, namely as cooperation among universities or higher education institutions. However, few experiences can be found mixing both fields. In Spain, one case was identified (Leonardo Project CSVM1 – Cross Sector Virtual Mobility), which is focused on the survey of different practice patterns – virtual ones – university students are performing in the companies.

The advantage of the virtual practice (where visual contact is not necessary) has made it become a new way of knowledge transfer between companies and universities (although higher coordination between them is necessary), thus offering important feedback to University institutions. Just a little time ago, the company practices required the student's physical presence in the working place, but nowadays this is changing thanks to a kind of practice where the student might be thousand kilometres away.

Another characteristic of this research is how people understand the Virtual mobility. When applied to manufacturing or business companies, the virtual mobility concept is understood but not applied as training tool at international level, rather to support regional or national inter-companies training. Therefore, the experiences analysed in Italy are to be considered much more as Blended learning, rather than Virtual Mobility as defined by MeVeL Project.

Austrian research also shows that virtual learning is, almost exclusively, offered by educational organisations and booked by individual persons (employees). They were not able to find a company that was working with the virtual training concept. Whenever a company was working with virtual technology, it was used as a conference tool to communicate with other sites etc.

The same happens in Turkey. Joining to international forums for exchange of knowledge and experience and knowledge exchange within small private group of international colleagues who we met during abroad practice were two sample usage of the concept. Reponders were more mentioning about „exchange of knowledge and experiences" rather than learning dimension. This may be mostly because of the perception of „learning" phenomena as

business/working life is mostly solution oriented. This is extremely true for production process which involves quite number of issues regarding to trouble shooting and finding technical solutions.

This is an important context-based information to include in the planning of further activities, as the language related to the virtual mobility's concept is not widespread nor common.

2.2. Institutions / organizations involved in the virtual mobility.

Here again, the conclusions are quite similar among countries.

In Spain, nowadays the main actors are linked to the training world and, in this field, the universities have used this methodology the most. In VET centres, this methodology is not so widely expanded. In the productive field, the big companies, with different geographic sites, spread in different geographical areas use their intranets, but not the like virtual mobility is understood in Mevel (learning tool), but as a communication tool (knowledge management).

Following the Italian conclusions, the term Virtual Mobility (VM) or Collaborative Online International Learning (COIL) underpins four essential dimensions: it is a collaborative exercise of teachers and students; it makes use of online technology and interaction; it has potential international dimensions; and it is integrated into the learning process. Insofar, the institutions involved in virtual mobility are mainly Universities, although some training agencies started to test such an approach. Large companies use online cooperation tools, which might be used for virtual mobility, mainly for knowledge management purposes.

As mentioned at the earlier section, there are not clear and achievable data indicating that industry is utilising „virtual mobility" in the context of MeVeL Project in Turkey. However, brain storming and experience exchange virtual meetings have been realized within the multinational production companies, especially who have multiple parallel or complementary production facilities in different parts of world. As they need to exchange working practices, they realize video conferencing based meetings when they are able to have this knowledge exchange, such as Mercedes Benz.

Austria has gathered some experiences from EU projects where we worked and work with virtual learning.

- For example ADAT: Antidiscrimination awareness training for trainers, coaches

http://www.adatproject.eu/

- Q-Bicon: A Qualification scheme for BIomass CONsultancy) supports this by creating and providing an innovative training course for professionals working in the field of BIOENERGY.

http://www.q-bicon.eu/

Training organisations: (nearly all big training organisations in Austria offer some virtual trainings. This Trainings include the possibility of virtual mobilty, but mostly are used in a national frame). See some examples on the next pages.

Bfi Steiermark: we offer virtual learning parts in the training „Metal Apprentice with A-level" mainly in German and English lessons and communication paths within the participants and trainers.

It would be possbile to share these lessons with participants from other organisations and other countries, but it is not part of the learning concept.

www.bfi-stmk.at
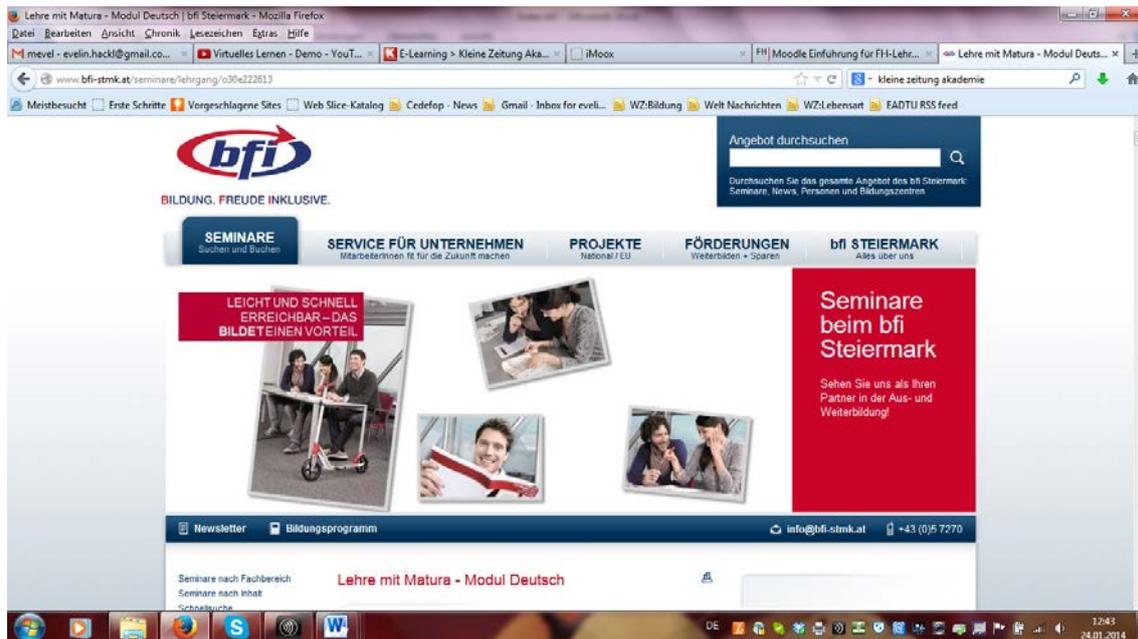
In the next months it is planned to offer the ECDL (European Computing Driving License) with parts of virtual learning.

Kleine Zeitung Akademie: English courses/Italian courses with virtual class room

Open classroom for participants from different enterprises or private learners

http://www.kleinezeitung.at/allgemein/akademie/elearning/index.do
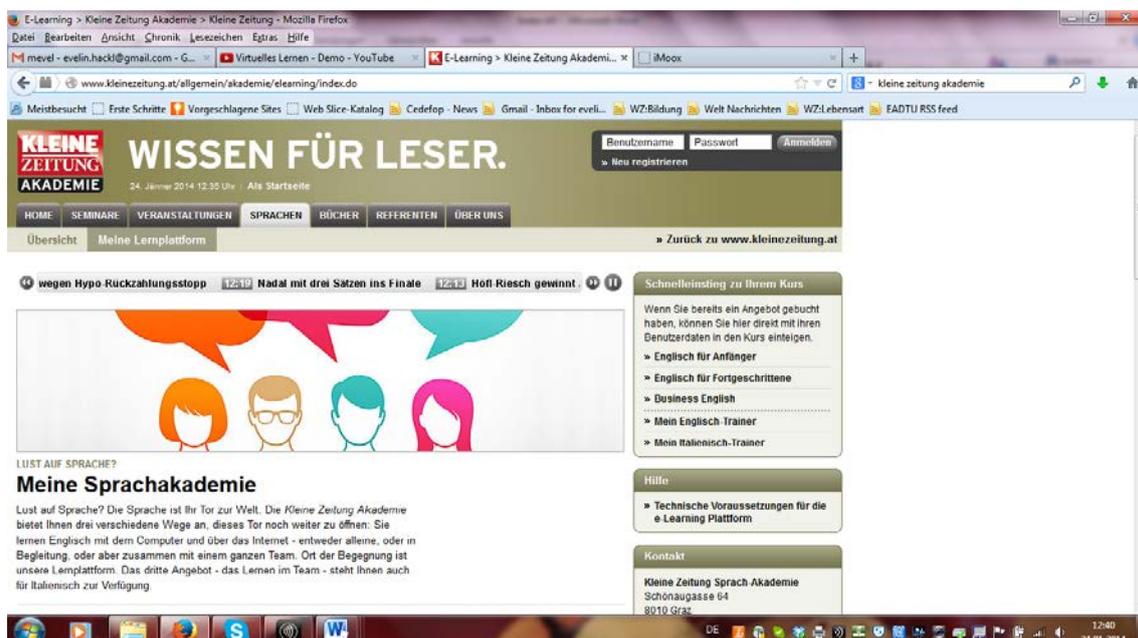
Universities:

FH Joanneum, Example of virtual camp for trainers

http://www.fh-
joanneum.at/aw/home/leitbild/organisation/Zentrale_Services/zml/News_Events/zml_events
/~cdbi/Moodle_Einfuehrung_fuer_FH_Lehrende/?lan=de

http://www.imoox.at/

Immox offers Open source courses from the university of Graz and Technical university Graz.

All contents are free for use for everybody.

www.immoox.at

Berlitz: A Global Education Company: Language courses also with virtual classrooms

www.berlitz.at

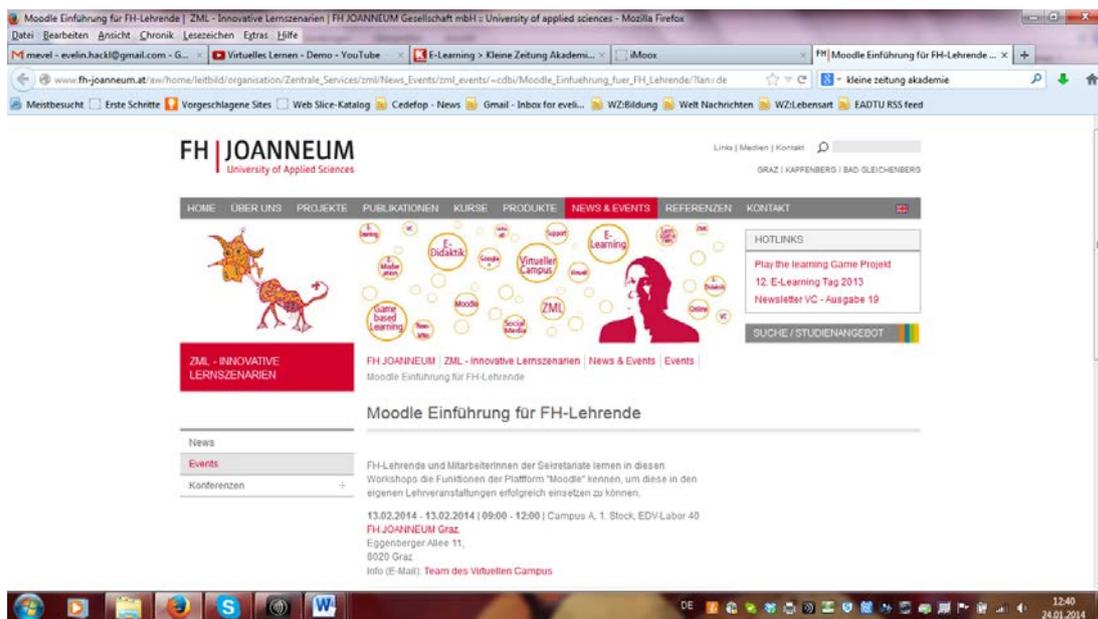*Chamber of commerce, Austria: Webinar1-3 to the topics of Management, Human Resources Management; Innovation*

https://www.wko.at/Content.Node/Service/Unternehmensfuehrung--Finanzierung-und-Foerderungen/Unternehmensfuehrung/Strategie--Organisation-und-Marketing/Interaktive_Expertengespraeche__Personaleinstellung__Innova.html

Webinar 1 „Einstellen von Personal – aber richtig"

Webinar 2 „Innovationspotenziale erkennen und nutzen"

Webinar 3 „Mit Content Marketing Kunden erreichen und gewinnen"

2.3. Strengths and weaknesses of virtual movility

Despite having not much literature on the subject, in the four countries the advantages of this approach far outweigh the weaknesses, as players who have used it say:

Some *strengths* mentioned in Spain:

- Access to the best talents, no matter their origin
- Better productiveness than in traditional practise
- Reduction of the inefficiency (it avoids free riders).
- Possibility to approach multidimensional, transnational and multicultural projects (through ICT)
- Minimising the costs of traditional grants
- Improve innovation.
- Improve professional development
- Get to know new people
- Share ideas
- Collaborate and take part in learning projects

Weaknesses:

- Technical limits: lack of information on the possibility to perform this kind of practice.
- Organisational limits: it depends on the culture and structure of the company; lack of agreements to carry out virtual practice.

From Italin point of view, according to the Best practice manual for Virtual mobility[6] „*Indeed, through the use of ICT, students and teachers can experience international exchanges of expertise while staying at home. As mobility and internationalization are becoming increasingly important in today's society, this is a significant evolution for those not able to enjoy any physical exchange.*"

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[6] Ibidem, 2006.

On the one hand, in 2006 the main challenges identified concerned the organisational features of the VM. The increase of VM initiatives in Higher education and the exponential growth of MOOCs[7] could be use as a proxy to demonstrate such a „disadvantage" has been solved.

On the other hand, training centers did develop online cooperation experiences, although they cannot be considered „pure" VM, according to the MeVeL definition, as the international dimension is completely missing. Online cooperation experiences through platforms is subject to the quick development of technology, which maks the platforms an obsolete tool in few years.

When launching an innovative program it is essential to spread the idea among the main stakeholders and opinion leaders. It is important to implement a launch program (meetings, webinars, phone calls, email campaigns) so that key people can understand the importance and urgency of the activities. Finding the right sponsors for the program will facilitate and speed up the process of recruiting participants.

Well-designed solutions can't exist in an organizational vacuum. Commitment, support and reinforcement by senior leaders must accompany employees' learning efforts with major business initiatives. Effective virtual mobility learning compels to think about a business problem to be solved. On the contrary, many organizations start with an abstract idea of the learning intervention model. Instead, we need to start having in mind the business objectives. Unlike traditional education, virtual mobility programs shall improve competences of the participants and at the same time increase business performances, improve change management and speed up the innovation process.

Online learning must be used in right doses. According to SIAV experience in a Blended Learning project[8], managers prefer to have the opportunity to discuss face to face about their problems and issues. Learning is also a social process. Technology is not as "easy" or "ubiquitous" as people would think. Many people and companies don't have the required level of knowledge and infrastructure (for example, broadband, language competences).

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[7] Massive Open Online Courses. MOOCs and VM are considered two key dimensions of the Open Education revolution in higher education.

[8] LEONARDO DA VINCI BELT – Blended Learning Transfer: Rationalising, learning and transferring the use of technological platforms to enterprise-based learning strategies, project n. LLP-LDV/TOI/2007/IT/197, www.leonardobelt.eu

Based on the available literature about VM, the experiences and the questionnaires collected, the main *strengths* identified in Italy are:

- Access to a wider number of learning opportunities
- Shared learning within the company
- Cost reduction and better time management
- Team building
- Effective cooperation about business-related issues

The main weaknesses identified:

- Access/use of fast internet connection
- Use of ICT tools and hardware
- Language barriers
- Unclear organizational aims or lack of commitment and relation with the business scope
- Lack of "human"/ face–to-face relationships might led to weaker ties

In Austria, implementing new systems brings change processes because the roles are changing. Whether HR development manager, trainer or teacher: they all come from learning concepts that used to be strongly externally controlled. The new social learning and e-learning systems, however, are mainly self-organised. Therefore, self-organisation is becoming a key competence. There is a focus on competence goals rather than on knowledge and qualification goals. Within the self-organised approach, the participants mainly define their own goals, which must, of course, match the strategic objectives of the enterprise.

For trainers, e-learning or virtual learning means that they need to hand over control; that might initially result in uncertainty. Therefore, it is important for trainers to get to know these new learning models as learners themselves. That way, security and understanding can be built up.

Since the participants' self-organisation becomes a key competence, they might easily feel the pressure of excessive demand. Therefore, it is important to decide on the learning areas

together with the managers. Furthermore, a partner (tutor) must be available, who can bring the learner back on track if she/he demands too much of herself/himself.

When companies implement the new forms of learning they need to be careful not to simply tell, for example, their IT department to choose a learning management system; the systems must meet the needs of the learners. The focus lies on the learning itself. The motto is: Leave the externally-organised behind, move towards the self-organised.

3. Practice of virtual mobility development in the Metal companies.

3.1. Their knowledge about the concept, systems, methods, tools...; reasons of using it or not

The first conclusion shared by partners is that it is really hard to arrange interviews with enterprises to the topic of Virtual mobility. The reason is the fact, that virtual mobility is not well known in the enterprises of the metal sector.

In Turkey, although it exists some numbers of organizations would be aware about existence of virtual mobility concept and even practicing them, their successful contacts in visited factories did not seem to have such background. Three factories were contacted/visited in Turkey during the survey, number of employees ranging from 200 to 2500.

Negative reply was received from all regarding to their knowledge about the concept, methods, tools of virtual mobility. Therefore none of them were practicing such a virtual mobility activity. However, after explaining the definition of virtual mobility within MeVeL Project, almost all responders have found the concept familiar from experience exchange point of view.

In Spain, the knowledge of virtual mobility methodology is not known by companies and this is because they don´t know the methodology. The largest ones can use an intranet, such as an internal communication and management tool, but not as a learning tool as we describe within the project.

This is the example of one company interviewed. Through this tool they make annually a comparative study of different ratios reported by the different units of the company (geographically dispersed). As result, the units with worst and best ratio are identified. The action training is planned from this result (the best one teaches the leak one). The training is structured and afterwards, evaluated.

The same happens in Italy, where none of the companies have a specific experience about the VM and the concept is also unclear, although the use of online cooperation tools for knowledge management is well established, particularly in internationalized companies.

The tools are used to check the business performance against KPI or production objectives (eg. Competence matrix tool). One company, considered its internationalized organisation,

arranges online meetings, once or twice per month, in areas such as finance, production, sales and HR management, in order to ensure a common "language" and understanding of concepts at global level. The main tools include call conferences, skype conferences and webaccess (to share files and content remotely). Web conferencing so far has not provided an added value.

The second company has no experience of virtual mobility, as the training for production workers is provided on the job or according to specific needs shared with the general director.

In Austria, they could not find one enterprise, where it is used in our definition. Possible interview partners told them by phone that they do not use virtual mobility. So, in their opinion the necessary processes for developing virtual learning did not happen in this sector until now in Austria. This new learning management systems are not well known and self organised learning is not used.

3.2. Organization of virtual mobility in the training processes in the enterprise.

From a general point of view, according with Spanish´s companies, it is a good idea to include this kind of methodology in the training process, but they identify some risks. When they share the processes, problems, results … whatever (information) with other units of the company the competitiveness arises among them, because the different units/ companies fight for the markets. "*The idea is good but sometimes is difficult to put in practice*".

In Turkey, none of the companies has a direct valable experience with VM according to the defintion of MeVeL.

Although all Italian responders stated that they do not practice virtual mobility, they commented to the concept as: „*If we do a partnership with another company abroad, this will help us*" and „*Competitiveness of production and self development of engineers would increase by the usage of this concept*", whereas one responder stated that they have already their own training programme and e-learning is not applicable in their field.

In Austria, they only found one learning activity which includes the possibility to extend it to international virtual learning groups.

In the bfi training center in Leoben, in the metal training sector, the participants of Hydraulik/Pneumatic trainings work with special software. For example they use a virtual construction plan and with a simulation programme they must build up a construction. The simulation programme shows then finally if the result would operate well or not.

We can imagine, that it would be possible to share this training with participants in other partner countries if it is possible to share licenses. The interviewed group decided **Programmers and Controllers in the production sector and maintenance/service workers as the best group using vitual learning opportunities**.

3.3. Curriculum design, training time and progression. Training needs

According with company´s words, the activity of programming and controlling is very concrete and very adapted to the company circumstances. Therefore to develop any specific (technical) training content transferable to other companies (situations) is almost impossible (each company depends on its own resources and has different programming and control management tool).

According with people interviewed, the training should be more general and they point out some of the training needs that our core group "Production Managers and Engineers bearing controlling" responsible could have; they are the following:

- People management: This worker has to know how to give instructions to his / her group and how to lead working groups. He / she must be respected by his collaborators
- Negotiation / conflict resolutions…...
- Quality measurement. It is important to include in the training something practical, such as basic tool in Excel which workers can practice with
- legal aspects
- production management, financial management and sales management
- Practical news/hints in new production technologies,
- new machine tools/models,
- new more durable and esthetical solutions in handbag accessories,
- compressor accessories production

3.4. Main advantages / disadvantages for using / applying the virtual mobility

Some *Advantages* mentioned by the four countries:

- Problem resolutions in common
- Learn from each other,
- Be updated
- More competitive workers and a better work organization
- With regard to the relationship with customers/suppliers it might be useful to understand/set the Electronic Data Interchange (EDI) for logistics or other way to manage changeable data sets.
- As support to training (on site, face-to-face) about PLM, as a "refresh" of the issues considered on-site.
- Strengthen the sense of belonging to a valuable company, overcome resistance to innovation and foster cooperation among employees.
- Increase the competitiveness and the efficiency of production process
- To have the newest information quicker
- Quick implementation of new contents
- Advantage in competition
- Saving costs for tools, software, instruments

Concerning the *Disadvantages*, from the sight of an Austrian vocational training center, they think that the most disadvantages in using virtual mobility are that the employees think they cannot concentrate on the self learning process because they do not have booked time just for learning when they are not in an present time seminar. If they stay in the enterprise for a learning process they always have an eye on their duties and tasks and can get disturbed by colleagues and by the manager.

Maybe another disadvantage is the fact, that many interviewed students with virtual experience said, they feared to stay alone with problems and to have no teacher all the time for explaining chapters more times.

Nonetheless, VM cannot substitute face-to-face training and cooperation among people. Moreover, it requires satisfactory levels of language competences and well-functioning internet connection.

3.5. How the virtual mobility, methods and tools contribute to develop workers' competence and companies' performance and competitiveness

As it is mentioned before in the responses to "advantages" question, the companies consider this methodology very useful to improve workers' competence. Many times this kind of workers learn a dispositive, tools, specific knowledge or whatever… but afterwards they express that is very difficult to implement it in their job. For those occasions, for ex, it would be very useful and interesting to take this kind of methodology (VM) to share the experiences and learn easier how to implement the new tool. Otherwise, many times we have to learn on their own.

One Italian company commitment is to enhance cooperation among geographically global units through physical mobility. Online or distance training might be applied to very technical training about operational tools (eg. New software) and scale up cost of transversal training. Otherwise, the company firmly believes it is more effective to provide on-site training and international training at the mother company. Virtual mobility might be applied with the international and also to strengthen company values and technical competences of sales force.

Other company, however, is rather open to the opportunity offered by VM, to support the salesmen of the commercial units abroad and to foster the cooperation among employees.

3.6. Main obstacles of company to participate in the virtual mobility

According to the interviewees, the main obstacle is the lack of commitment "*we never felt the added value of this training methodology*" and workers resistance to share their knowledge, as the methodology requires a cooperative attitude and approach.

Other *obstacles* mentioned by enterprises are:

- lack of time
- the reality of each company is different
- privacy policy of each company
- motivation of top level management,
- lack of information about the methodology
- few special training offers for the metal sector

4. Metal employees´considerations concerning virtual mobility.

We have got 80 answers from Production Managers and Engineers bearing controlling responsibility (27 Spanish; 29 Austrian; 10 Turkish and 14 Italian).

We have to highlight the positive answers about this methodology. Below, we show what they think regarding to:

4.1. Knowledge about the concept, systems, methods, tools...; reasons of using it or not.

In general, this methodology is not widely known by the companies or by this group of workers. The knowledge about the concept is minimal. If someone knew something about virtual mobility during the questionnaire then he had only an unclear vision of it. No knowledge about experience of virtual learning exists in the companies of the interviewed employees.

Nevertheless, once described, there are much more reasons to use it than problems. Some reasons are:

- Saving journeys
- Making it easy to collect knowledge
- Interesting exchange of knowledge in a wide geographical area, in order not to get blocked in routine working methods
- Sharing experience is learning and in daily work, we do not have the opportunity to share new knowledge, as the people we are with work in a similar manner
- Allowing training with lower time and money cost
- Flexibility
- Knowing different ways to do things, sharing experiences and different points of view are enriching.
- Support among the different companies in the group.
- Saving time
- Independent from time and location
- In some fields I can imagine to use it (no concrete answer in which fields)

On the one hand, all the companies with one exception are very keen to use VM as training tool, coherently with the strengths outlined above. On the other hand, most agreed not every

content can be shared or learnt through this tool. Moreover, there is no offer available at local level or from trusted training providers.

4.2. Curriculum design, training time and progression. Training needs

The mentioned training needs go from very <u>general</u>: communication practice, sharing similar problems, sharing experiences, used working methods, successful cases…; to more <u>transversal</u> ones: motivation, meeting management, project management, Human Resources management in managing skills, safety, people management skills; and to more technical ones: industrial management, production management.

The key training contents suggested by the Italian questionnaires are quite technical, such as software courses, maintenance of machinery, techniques and processes for production management, lean production, visual management, service for the update of technical staff. The informal feedbacks highlighted also an interest in tools to support innovation and foster cooperation among employees.

Suggestions generated by the interview include the use of new software and lean production, product life management (PLM) and Electronic Data Interchange (EDI) for logistics.

Stated training needs from Turkish workers point of view are:

- Metrology equipment;
- High temperature oven painting;
- Machine tool selection/market follow;
- CNC/PLC programmes for specific item productions with critical tolerances;
- Practical and recent techniques in production lane.

According with the Austrian responses, the Technical content (Gear technic, Hydraulic/Pneumatic, CAD-CAM) and the Logistic, transport seminars are the most important needs.

4.3. Main obstacles to participate in the virtual mobility

According to the answers collected, the main obstacles are:

- Technological means (a good internet connection, updated technology, start-up investment)
- Lack of time
- For some topics, being-present methodology makes understanding easier
- Direct contact is important to understand particular details
- Lack of knowledge of the methodology
- Management awareness
- Technical communication
- Lack of knowledge of the language
- Competences barriers: language skills, uncooperative behavior of participants;
- Organisational barriers: lack of commitment.
- No reference contact person in virtual learning courses
- Only few virtual training offers, few advertisements in this field

5. Transnational conclusions

Most of the experiences using this kind of methodology (VM) are within the training field, not in the productive one and, more concretely, in the field of higher education.

The "virtual mobility" concept according with Mevel Project definition is understood by manufacturing or business companies, but it is not applied as a training tool at international level, rather to support regional or national inter-companies training.

Almost all responders have found the concept of virtual mobility familiar from experience exchange point of view.

The use of online cooperation tools for knowledge management is well established, particularly in internationalized companies.

The language related to the virtual mobility's concept is not widespread nor common.
From metal companies´point of view, it is a good idea to include this kind of methodology in the training process.

Programmers and Controllers in the production sector and maintenance/service workers are cosidered as the best group using vitual learning opportunities.

Despite having not much experiences on the subject, in the four countries the advantages of this approach far outweigh the weaknesses:

- ✓ Some *strengths*:
    - Access to the best talents, no matter their origin
    - Better productiveness than in traditional practise
    - Reduction of the inefficiency (it avoids free riders)
    - Possibility to approach multidimensional, transnational and multicultural projects (through ICT)
    - Minimising the costs of traditional grants
    - Improve innovation
    - Improve professional development

- Get to know new people

- Share ideas

- Collaborate and take part in learning projects

- Access to a wider number of learning opportunities

- Shared learning within the company

- Cost reduction and better time management

- Team building

- Effective cooperation about business-related issues

✓ Main *weaknesses* identified:

- Access/use of fast internet connection

- Use of ICT tools and hardware

- Language barriers

- Unclear organizational aims or lack of commitment and relation with the business scope

- Lack of "human"/ face–to-face relationships might led to weaker ties

- Technical limits: lack of information on the possibility to perform this kind of practice.

- Organisational limits: it depends on the culture and structure of the company; lack of agreements to carry out virtual practice

- Lack of time

- Privacy policy of each company

- Motivation of top level management

- Few special training offers for the metal sector

The mentioned training needs go from very general: communication practice, sharing similar problems, sharing experiences, used working methods, successful cases…; to more transversal ones: motivation, meeting management, project management, Human Resources management in managing skills, safety, people management skills; and to more technical ones: industrial management, production management, software courses, maintenance of machinery, techniques and processes for production management, lean production.

6. Annexes

6.1. Virtual mobility experiences (ES, IT, AT and TR templates)

6.2. Interview results (ES, IT, AT and TR interview guidelines)

6.3. Questionnaire results (ES, IT, AT and TR questionnaires)