



Event on Education

Work virtually!

Boost your career at student speed!

Ljubljana, Slovenia
2nd of July – 13th of July 2010



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1. Bodies involved

1.1. Facilitators

Olga Iemkova (Lviv, Ukraine)
Salvador Caetano (Porto, Portugal)
Vasilij Savin (Uppsala, Sweden)
Zane Zondaka (Riga, Latvia)

1.2. Professors and experts

Antonio Comparetti
Christina Brey
Demetres Briassoulis
Erwin Heylen
Mariet Vriens
Miran Lakota
Slavko Dolinšek

1.3. Participants

Agnes Livia Bodor (Budapest, Hungary)
Alexis Oudeville-Dumont (Paris, France)
Alvaro Cañada Valverde (Madrid, Spain)
Anna Valyagina (Ekaterinburg, Russia)
Annamaria Jacso (Miskolc, Hungary)
Diogo Figueiredo (Almada, Portugal)
Duygu Bayraktar (Istanbul, Turkey)
Eike Alunurm (Tallinn, Estonia)
Gökhan Üngören (Ankara, Turkey)
Ivana Mladenovic (Skopje, Macedonia)
Ivana Cakonceva (Skopje, Macedonia)
Klimentina Straka (Sofia, Bulgaria)
Manuel Guillen (Eindhoven, Netherlands)
Marica Stojanov (Novi Sad, Serbia)
Olga Grebenshchikova (Ekaterinburg, Russia)
Olha Danylo (Lviv, Ukraine)
Raffaele De Lucia (Naples, Italy)
Silvia Tripsa (Timisoara, Romania)
Veera Narvo (Helsinki, Finland)
Zixiao (Aaron) Qiu (Liege, Belgium)
Zuzana Humajová (Bratislava, Slovakia)

1.4. Thematic Networks

1.4.1. EuroPACE ivzw

EuroPACE ivzw is a European non-profit association of universities, educational organisations and their networks.

Their main objective is to foster networked e-learning

- for virtual mobility,
- for internationalization of higher education,
- for knowledge creation and sharing, and
- for lifelong learning.

EuroPACE has built up a long history in research, development and demonstration in technology enhanced teaching and learning, mainly through its active participation in regional, national and international projects.

Through these activities EuroPACE wishes to strengthen the connection between regional, national and European bodies and universities throughout Europe.

Therefore the EuroPACE team is in an excellent position to give its members information on specific programmes, to help members with project management, to provide technical support or to contribute on a content level or to coordinate the full development of own projects.

The EuroPACE projects that were discussed by the students present in Ljubljana between 2nd and 13th of July are EU-VIP, Move-IT and EPICS.

1.4.1.1. EU-VIP (Enterprise-University Virtual Placements) – is a two year EU-funded project (October 1st, 2009 until September 30th, 2011) under the Lifelong Learning Programme (ERASMUS). Its goal is to enhance the quality, efficiency and impact of international work placements by focusing on how to organize these placements.

The EU-VIP project will design models and services for:

- virtual mobility activities to prepare students for a stay abroad and to sustain the experience after they return,
- fully virtual placements.

These models and services will be developed through a process of testing and improving.

Project website: <http://www.euvip.eu/>

1.4.1.2. **The Move-IT** - is a one year project supported by the European Commission under the Erasmus, Lifelong Learning Programme (November 2009 until October 2010). It focuses on blended/virtual mobility and e-coaching methodologies for the support of physically mobile students by promoting and disseminating innovative initiatives, best practices and activities of former projects in the field.

Move-IT is aimed to maximize the impact of physical mobility of students, teachers and staff by:

- disseminating innovative initiatives
- bringing together projects and potential users
- emphasizing the transfer and take-up of project results by new users and main-streaming them into higher education practices.

The partners involved will exchange the outcomes and good practices of its predecessor VMBASE and other related projects such as REVE, Being Mobile, More VM, E-MOVE, SUMIT, ESMOS, Europe Now, Mobi Blog, etc.

Project website: <http://move-it.europace.org>

1.4.1.3. **EPICS (European Portal for International Courses and Services)** is a project, funded by the European Commission, the supporting infrastructure of Virtual Mobility (VM- is improving accessibility to other university courses European wide and enables students to individualise and specialise their study programmes) (1 Oct 2008 till 30 Sep 2010).

EPICS offering international courses as integral part of the university study programmes. The main objective is to work from Virtual Mobility projects towards a Virtual Erasmus programme.

Project website: <http://www.eadtu.nl/epics/>

1.4.2. **ERABEE (Education & Research in Biosystems Engineering in Europe)**

The ERABEE Thematic Network, is a follow-up of the USAEE Thematic Network and is co-financed by the European Community in the framework of the LLP Programme. Its lifetime began on October 1st 2007 and will end on September 30th 2010.

The innovative and novel goal of the Thematic Network is to promote the critical transition from the traditional discipline of Agricultural Engineering to the emerging discipline of Biosystems Engineering, exploiting along this direction the outcomes accomplished by the EU funded predecessor, the USAEE - Thematic Network. It also aims at enhancing the compatibility among the new programmes of Biosystems Engineering, aiding their recognition and accreditation at European and International level and facilitating greater mobility of skilled personnel, researchers and students.

2. Abstract

A BEST Event on Education (EoE) is a public event of the Board of European Students of Technology (BEST).

“Work virtually! Boost your career at student speed” EoE was organized by BEST and was held in Ljubljana between the 2nd and the 13th of July 2010.

This event was a symposium, where 22 students from the entire Europe met for 10 days and expressed their opinion on topics related to education. The Symposium was led by the Educational Committee of BEST (EduCo) with the help of EuroPACE, ERABEE and the hosting Local BEST Group of Ljubljana. During the event the discussions were usually held in groups facilitated by BEST members. Prior to the working sessions, topic presentations were delivered to the participants by experienced professors or thematic networks’ representatives.

The event was focused on virtual mobility of students of technology. We discussed about existing programmes led by EuroPACE – EU-VIP, Move-IT and EPICS – in order to improve the existing methods used in virtual programs and to develop new ones for the future. Another topic that was discussed was about the innovation and creativity in university settings and how it contributes to raising the attractiveness of engineering among students. The last topic discussed was delivered by ERABEE and its focus was on Knowledge Management and methods that could be used in order to preserve the information during longer time periods.

The students who were involved in the discussions received sufficient background knowledge to participate actively to each session; BEST provided topic introductions and organized preparatory sessions, where several professors had speeches and presentations about the projects, topics and working methods used during the symposium.

3. *Virtual Mobility*

The use of information and communication technologies (ICT) to obtain the same benefits as one would have with physical mobility but without the need to travel is called virtual mobility. It implies that physical travel is to some degree replaced by online activities using the new ICT.

The key applications that are making an impact on our travel behavior and the way we transport things are:

- e-work (telework, telecommuting - all the forms of remote work using ICT)
- e-business & e-commerce (business to business and business to consumer online transactions and service/product delivery)
- e-services (e-government services, e-learning, telemedicine, etc)

3.1. Pilot Projects

3.1.1. Outcomes of presented pilot projects

During the Symposium organised by BEST in Ljubljana between 2nd and 13th of July several pilot projects were presented and discussed together with the 22 participants willing to take part to the developing of the educational online system in Europe. In the following the outcomes of the sessions and the students' expectations and preferences will be detailed:

3.1.1.1. Online education and evaluation tool

This pilot project is the most attractive one from students' point of view, the main reason being the concept of being able to test their knowledge before going on exchange and identify any knowledge gaps they might have. Therefore students coming on exchange will be more aware what academic level is to be expected and objectively assess if they can manage it.

Some students that took part to the Symposium in Ljubljana misunderstand the concept of this project and consider this online teaching tool a replacement for preparatory one. Many participants think that such online teaching tool could be useful for master student who are older and often work and study at the same time. In this way, they can study at their own pace. Students liked the ability to stay at home and study courses offered in foreign universities.

3.1.1.2. Virtual buddy system

Being in a foreign country, experiencing a new culture and a new educational system might be very difficult for everyone that is why all participants agreed that using local student to help incoming exchange students is very helpful. Local students usually help with solving practical issues, since they are used to administrative systems of their universities and countries. They help to adjust to local educational system and can advise what courses to take or avoid.

However, such practice is already quite well-spread, so it was marked as not too innovative.

3.1.1.3. Go Abroad

It was voted as one of the most exciting pilot projects. It is believed to be really useful for students planning to go abroad for exchange. The special part of this programme is the fact that it could offer the chance to find and exploit experiences of previous generations of students. However, because students are not that interested in were concerned that it would take a lot of time and effort to maintain, especially writing Go Abroad diary, that they have to fill regularly.

3.1.1.4. Exam Aquarium

Students think that it is a very progressive technology and more universities should be equipped with such rooms. Since room is monitored, cheating becomes very difficult. It is quite convenient that student can take exam at any time.

If student fails an exam during his exchange, instead of coming back to host institution, he can re-take exam at home using such environment.

3.1.1.5. Virtual Window for Study Abroad

This was selected as one of more useful pilots. For incoming students it is an opportunity to learn important procedures, what to expect from the country. Quite often exchange students are a bit clueless in the beginning what they are expected to do when they come to study abroad.

The pilot also provides communication space where students can share their experience and ask questions or for assistance, so more experienced students can help their junior colleagues.

In addition, students can learn important terms that are used at university and across different courses that helps to minimise cultural shock.

3.1.1.6. Virtual Exchange of Students Mobility Experience

Participants liked this pilot, because it allows watch the life of exchange student abroad and ask questions easier. Since it is less moderated and censored area, students feel at ease and can express themselves more freely.

3.1.1.7. Support oral exams at a distance

Students were quite favorably predisposed towards this examination form. They agreed that logged sessions will help resolving grade disputes, if they arise. Also such exams can be convenient when student can not participate in exam physically, so if exchange student had to go home earlier due to different academic schedule, he can still take exam. It is helpful for students with movement disabilities, as they do not have leave house to take the oral exam.

3.1.2. Pilot Projects evaluations according to picked criteria Move-IT& VM-BASE

Pilot Project	Places awarded (1st, 2nd and 3rd by different teams)
Virtual Window for Study Abroad	1 3 1
Virtual Buddy System	2 2
Virtual Exchange of Students Mobility Experience	2 2
Online education and evaluation tool	1 1 3
Exam aquarium	3 3
Supporting oral exams at a distance	2
Go abroad	4.1

3.2. Pilot Cases for EU-VIP Evaluation

3.2.1. CASE I - Fully virtual internship for students from the Belgian university college KH Leuven

While discussing the fully virtual internship, in which a group of Belgian students conducted a market research for a Finnish company, the following points were approached: language and time barrier, ICT (skills required and technical failures), international experience, similarities to a non-virtual placement and advantages, disadvantages of this experience and finally some suggestions.

When discussing the time difference, although in this case it is of only one hour, one should take into consideration that arrival, lunch and closing times are shifted by that one hour which means a total of three hours of added unavailability.

As for possible language barrier participants found it not appropriate, as students taking part are supposed to know English and in most cases it would be beneficial for them as a learning experience. However a few problems were pointed out that should be considered: constantly switching languages could make communication more difficult and the translation of documents from one language to English and then to the other could affect their quality. Furthermore the need of a professional/business English to take part in the internship. But again the general opinion was that if you don't practice you will not learn.

The same general opinion exists for the need of ICT skills. You should try, fail and learn from mistakes and that, nowadays, students should already possess good technological knowledge. The problem would thus lie on the company's side where having an older worker, with less technological background, in charge of the internship could affect communication. On the other hand this would depend on the technology used.

When compared to an actual internship, where students travel abroad, participants felt it to definitely be an international work experience and detected a few important similarities:

- You still work with people from a foreign country. Cultural differences still need to be taken into consideration
- In this particular case, conducting the market research was much simpler
- Preparation for post-studies work
- Real/Usable work; Students see the benefits of what they do (very important)

However, this internship would not always replace a fully virtual one and should be seen as a separate experience. Added benefits of this experience are:

1. An increase in software skills
2. An increase in online communication skills; Nowadays many companies already have foreign contacts
3. Ability to reach markets such as Russia where it is very difficult to penetrate if you are unaware of the habits (this case fits the companies problem perfectly)
4. Reduced costs for students and for the company

The added value of an actual internship over a virtual one consists of the following:

- Getting to know the culture and not just the working culture/ methods
- It is easier to have an overview of students work

By the end of the discussion participants felt that this experience was a definite plus on the CV (i.e. in Estonia it would definitely be very appreciated by companies).

The participants also suggested the following ideas to keep in mind while developing these cases:

- Most of the problems proposed during the discussion are as valid for an actual internship as they are for a virtual one
- Even when problems differ you just end up changing a set of problems for another
- Students should have the chance to visit the company before the virtual internship begins
- A virtual internship is more appealing than a virtual student exchange

3.2.2. CASE II - Virtually supported internship for students from the Belgian university college KH Leuven

Almost everybody agreed that they would like to participate in this kind of experience. Students went on an internship abroad and kept in contact with the home institution, participating every week in seminars and exchanged experience and asked for advice.

The idea of completing courses abroad while staying in touch with the home environment was very appealing. The idea of sharing your experiences gives added importance to what the student is doing. It is no longer just the student and the company but also his colleagues.

An added benefit is that this gives the home institution a good oversight of what the student is doing and if he is having any difficulties, allowing them to know when to intervene and when to let the student on his own.

However, some were concerned with how time consuming keeping the portfolio up to date would be. It did sound like an interesting and useful idea, but it is also added work over the usual workload in an internship. The general idea was that if you had to spend more time on writing what you're doing instead of doing something, then it is not that efficient. But if this is not the case then the use of an e-portfolio was especially desirable.

Almost everybody present in the discussion has had the experience in communicating through Video Conference and in many cases technical difficulties were experienced. This would greatly affect this case as the whole experience is very dependable on Video Conference. Another flaw of Video Conference is the person talking is completely stationary which, as most people with presentation experience know, makes the speech seem more dull and make it harder for students to focus on the speaker.

Availability of videoconferencing systems is not broad enough but it is the general opinion that it will be in the near future especially with initiatives such as this internship.

At the end, participants liked the approach used in this internship as students still managed to go abroad and have a physical experience and had the added bonus of getting the experience in virtual communication and communication tools. The inconveniences of Video Conference are mostly tolerable and will be probably improved in the upcoming year.

3.2.3. CASE III - Fully virtual internship for a Latvian student in an European organisation with head office in Belgium

On the case of a Latvian student who, working from home and communicating mainly by email, developed an online registration tool for an international conference, participants enjoyed the idea of flexibility that such an internship would bring, like the possibility to structure your day much more freely, working during the night if desired and not having to always work during the same period every day.

Motivation was again a concern. Working from home can be prejudicial especially for someone with low to no work experience. It is hard to motivate yourself with so many possible distractions. Even though the student mentioned this work was motivating for him it would not be the case for many people. This student probably fit very well with this kind of internship.

On top of the motivation issue, a lack of focus can result from working from home if there are many distractions. However a student is not limited to working from home and can go work in the university or at the library, in this particular case the student must have opted for working from home.

You are free not just to work when you want, but also where you want.

3.2.4. CASE IV - Fully virtual internship by Danish students

While trying to determine what were the issues in the fully virtual internship of nine Danish students doing a market research for a South-American company the following conclusion were reached:

The motivation of the students was not enough. Students only took up this task as a last resort (no other internship positions where available) and not because they were motivated to do it. Also such a task would have given them a school feeling and not a feeling of corporate culture making it harder for them to grasp its importance. Without real motivation students would do only the minimum to get the credits. Seeing as how the big motivator in foreign internships is missing, socio-cultural interaction, other motivational measures need to be emphasized.

Technology is obviously very important for this experience and the use of only email and phone was found lacking. Better technologies should be applied in such cases (the use of Video conferencing and e-portfolios for example is highly recommended). It gives students a better sense of reality and importance when conducting their task.

Going to an office when there seems to be no need for it seems arbitrary to students and should be either avoided or preferably the reasons behind it better explained

An increase in supervision is not needed as the students would rely too much on professors however guidance should come from the company itself and, when compared to an actual internship, the goals of such an internship should be very well defined as well as the company's expectations.

Also support for the companies from the HEI is needed as many will not be fitted to deal with the needs of a student taking up their first job and, especially in this case, the technological requirements for such an internship.

4. Attractiveness of Engineering

There are few learning methods which have been used during the Ljubljana EoE. These techniques include case study and learning café:

Case study

Discussions, normally moderated by EduCo member while somebody is taking minutes on a laptop. Students divided into several groups are participating in these discussions. Duty of the moderator to provide equal opportunity for everyone to share their experiences and opinions, keep discussion on track and on time.

Learning café

Conversation where participants are taking part in it separated into the groups. The main idea of learning café is to follow the questions and to try to stay on the topic. Cafés are best for conceptualizing or brainstorming.

4.1. Case Study for improving the Attractiveness of Engineering

Key factors in developing of understanding of engineering among high school students are awareness about the benefits of engineering profession, influence of the teachers and support from the government.

The participants of the symposium participate in the case study about how to promote engineering studies among high schools.

Case study description

The participants were split in 5 groups, separately groups worked in the strategy of promotion engineering studies during 2 hours. Later they presented it. The object was to create a plan of promotion of the engineering studies among high schools students.

Outcomes

During the working session the participants found that the best way for attracting more students to an engineering career is to promote engineering as a profession, to increase awareness of the role of engineers in society and to show the benefits that students will gain when they are making the decision to study engineering. How do they want to implement it:

- To make something practical, touchable to show that science subjects are real;
- To increase the number of work in the laboratory and to show some interesting experiments;
- To show that to find a good job is very easy with the diploma of engineer;
- Providing of personalized presentations for schools, to invite alumni engineers as guest speakers which will explain career perspectives and opportunities during studying;
- Popularization of engineer studies by social networks; students organizations; posters in universities, flash mobs;
- Organization of promotional events (Open door days and Campaigns);
- Creation of special interest groups to let pupils join to make new friends in new environment.

4.2. Creativity and Innovation in University Settings

Through the Learning Café working method the students discussed about what is most important for them on next topics:

- Preferred learning techniques and methods
- Ideal learning environment
- Entrepreneurship in Universities

4.2.1. Preferred learning techniques and methods

All of people are different and all of them have their own preferred techniques for better learning and understanding of information what they need. The lack of knowledge of different learning techniques and methods can affect the perception of the information, languages learning. This will lead to problems in communication and further development in learning and personality in general. Because of this we decide to discuss this problem with participants.

Outcomes on learning techniques and methods used by students in day-to-day life

The answers on this question were different. In this section we would like to list general accepted ideas that came up during the discussions together:

- When there is the time for exercises students prefer to study in groups, there the motivation factor exist, students can discuss the topic and there is the possibility to help each other in this case; about the oral learning mostly agreed that prefer to study alone;
- It is easy to remember the information by putting notes on wall in the room so every time student is passing he/she can read it, recording studies to a tape and listening of it while sleeping;
- For better memorizing of the information is good to read everything, write notes and then just study the notes; actually the process of learning them is already starting by just writing it;
- Also some students thinking that if the subject is boring, not very useful then it is easier to cheat;
- Almost all participants agreed that the method of the visualisation helped for better understanding and learning of the subjects. It will help to organize main ideas in a system, and keep picture in mind; the same time trying to make connections with student's own life;

4.2.2. Ideal learning environment

Everybody can agree that ideal environment is very important part of the successful learning. Ideal environment is the place where teaching and learning can take place in the most effective and productive manner.

Participants were asked to share their thoughts on ideal learning environment:

- One of the biggest influence on the learning process have teachers- they should be motivated about the topic, bringing examples from everyday living and make some jokes, make examples about the topic;
- To learn is the best when there is freedom to explore;
- The space for studying is playing very important role too: a large room, with plenty of space to have a number of projects going on at once without feeling cluttered, and so there is space to get up and move around when there is need to;
- Wireless Internet access should be available for students who wished to bring their laptops to school across the campus;
- About the learning part- courses should be small, face to face, but taught in mediated classrooms and with full web support.
- The music is the part of the learning process too. From simple drumming to more complex music involving difference instruments, which is influence and bringing emotions into a learning process.

4.2.3. Entrepreneurship in Universities

One of the tables during Learning Café was dedicated to analyse entrepreneurial spirit among students in universities. Students were asked to share if they knew any programs that help to start their own small business or spin-off.

The results varied a lot, some countries like Spain had special grants for students that can be used to start a spin-off to commercialise research results. The conditions in general are fairly friendly, if startup succeeds, then the grant has to be paid back and also university is entitled to some percent of profits, however if it fails, then students do not have to pay any money back.

However, students from Romania are actually discouraged to start their own business, because teachers are afraid of increased competition and prefer their students working in some companies rather than starting their own.

In Hungary, if a student makes an invention using university equipment and then tries to commercialise it, he is legally liable to share his profits with his university. From students' point of view, such practice stifles interest in starting a spin-off.

One of the main obstacles that prevent more students from starting their own is fear of failure. Students agreed that too many people are afraid of failing, both because failed start-up scars them mentally and more often than not it caused significant financial losses. Since the access to venture capital is very limited in eyes of students, in order to start your own business they believe you need to borrow money either from your family or take a bank loan. Therefore, when business fails it will become a heavy financial burden on the former business owner.

Another important aspect for students is work-life balance. Many students agreed that running your own business is more than full-time job. Most likely you will have to spend weekends and evenings working on your business. Few participants were willing at this point to make that sacrifice. For many young people present at discussions having healthy lifestyle, capability to go out with friends and enjoy life was more important than being business owner.

5.2.3.1. What can be done to encourage students to take more risks and start their own company?

First and foremost, students need to learn that failing is fine. It goes against everything currently being taught at school, when any failure is treated as catastrophe with equally disastrous consequences. Learning how to fail is one of the most critical skills required for entrepreneur. As one of the participants suggested: “We should take the chicken out... [from us]”.

Even-though, many people know the proverb “nothing ventured, nothing gained”, too few actually dare to leave their comfort zone and confront the unknown.

Students expressed desire for better support of entrepreneurship at universities. They would like to have presentations made by successful businessmen to get inspired and soak in courage to start their own. In addition, some sort of organisation that would gather like-minded people and help them build a professional network would be of a great help. Such organisation could also run some basic entrepreneurship courses giving basic information what it takes to start your own business. It could employ some marketing and other specialists, who could give valuable advice for dabbling entrepreneurs. This would also decrease anxiety and fear about starting business, since people would be more aware what it takes to run a company, what are the risks.

Additional services this organisation could provide to students include access to more advanced courses, so that students can improved their business competences, virtual platform, where students meet other specialists and can share their ideas or ask for advice. Since everyone is different, such a platform would facilitate forming teams consisting of people with different talents and orienting them towards the goal. Universities could also organise more practical projects, where students have not only to make a prototype, but also make an evaluation if such a product could be commercialised. The best project could be then awarded with some grant to make it a reality or professional assistance from lawyers to create a spin-off and monetise the development of this prototype.

Since new businesses mean more taxes and less unemployment, every government should be interested in encouraging entrepreneurship as well. It could provide some tax benefits for small businesses, less red tape to start a company and other legal and economical benefits.

4.2.3.2. Entrepreneurship at schools

Other participants argued, that entrepreneurship should be taught as early as primary school. In their opinion, it is very important to instil risk-taking, leadership and presentation skills from a tender age. Leaving it to university is quite often too late, as students are already well-formed personalities that are difficult to reshape.

Pupils at school need to learn how to sell (ideas or goods), deal with money and people, so letting them run a lemonade or cookie stall at school would very much help that. Also there is a need for other practical exercises how to work in team, motivate and lead other people, so later young people are more comfortable using those skills in their adult life. Some students came up with idea development circle that can be used to describe evolution of start-ups.

5.2.3.3. Idea development circle

Start working on your idea.
Check your results

- a. If idea does not work out and out of funding - Close down, game over, try again.
- b. If idea does not work out - Start working on new idea
- c. If idea does not work out, but has some potential - Improve the original idea

Repeat circle
Financial success

5. *Cylindrical gear speed reducer design tool*

Students were acquainted with the tool developed in Ufa State University to simplify the design process of cylindrical gear speed reducer.

However, since developers provided only demo version of their product, it was difficult to get complete picture of tool functionality.

Several suggestions have been made to make this tool more user-friendly:

5.1. Use time trials instead of stripped down functionality

It was really annoying for users to keep getting warnings, that functionality is not available in demo version. Limited functionality prevents product users from understanding all benefits that this product has to offer and making them less likely to use it in the future.

5.2. Provide complete documentation

The downloaded version had no proper documentation included, so it was totally not clear how to use this tool properly and what this tool is capable of. That is even more important for limited functionality demo, where users need to have a way of figuring out what they can do with this tool.

5.3. Make a web service out of this product

The interface of this product seems to be simple enough, that it should not be too complicated to make a web tool out of it. The benefits of this approach are lack of installation, access from everywhere, fine granular user access control, ease of upgrade and maintenance.

6. *ERABEE Day* *- Knowledge Management*

During ERABEE Day, representatives of the Thematic Network had 3 presentations.

The first one was made by prof. D. Briassoulis, who presented current state of affairs in Bio-systems engineering and why is it going to play an important role in the world economy coming decades.

The main focus of the presentation was to highlight the importance of shifting from crude bio-processing, mostly producing bio-fuels, to more advanced and knowledge intensive fields, like pharmaceuticals and fine chemicals, that could have wide range of applications and more eco-friendly than currently existing solutions.

Some participating students were familiar with this topic, as they either had some courses related to the field or wrote a thesis on related topic.

Second presentation was done by Italian teacher from Palermo, A. Comparetti. He presented how historical farming sites can be preserved for future generations, so that our grandchildren keep knowledge of traditional farming techniques from previous centuries.

There are several ways to preserve old farming buildings, that fell into disrepair when they became obsolete. They can be renovated and repurposed for more relevant activities, transformed into agricultural museums, or rebuilt into agro tourism sites – places where city dwellers can get in touch with nature and traditional farming atmosphere.

During the last presentation, local professor M. Lakota presented the historical path in Maribor University from Agricultural studies to Bio-systems engineering. He also briefly presented how study programmes were restructured to conform to Bologna process.