

# Europe-wide Co-operation for Efficient Vocational Teacher Education

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**Abstract:** *An overview of the main results of the last decade successful Leonardo projects supporting efficient development of Vocational Teacher Education will be given in this paper. There were three projects funded by the European Union Leonardo programmes during the period in question: 3L in 3T (Life-Long Learning in Technical Teacher Training), VELVITT (Virtual Electronic Learning in Vocational Initial Teacher Training) and MOTIVATE (Masters level Opportunities and Technological Innovation in Vocational Teacher Education). The two latter projects were co-ordinated by Óbuda University (the formerly Budapest Tech Polytechnical Institution) and the same consortium was formed by experts from Finland, Greece, Holland, Hungary, Portugal and the United Kingdom. The main impact of these projects was to enhance the professional status of teachers in vocational and technical fields by the provision of a coherent programme of initial teacher training and continuing professional development, incorporating Masters level elements, and increasingly using Web2 technology and VLE applications to support the efficiency of vocational teacher education.*

**Keywords:** *life-long learning; on-line community; common module delivery; technological innovation; virtual learning environment (VLE)*

## 1 Introduction

Most of the European partners in our three Leonardo projects had already participated in the first consortium formed to collaborate in the project entitled “Life-Long Learning in Technical Teacher Training”, abbreviated as *3L in 3T*. Towards the end of this first project we summarised the conclusions of using Information and Communication Technology (ICT) in life-long learning to give a perspective for further developments. Recognising the opportunities of new ICT developments experts from Huddersfield University (UK) initiated a new project supported by their experience on virtual learning environments. This second project, “Virtual Electronic Learning in Vocational Initial Teacher Training”, *VELVITT* in brief (<http://velvitt.banki.hu>) was co-ordinated by Bánki Donát Faculty of Budapest Polytechnic and the consortium consisted from eight partner

institutions from six European Union countries. One of the main results of VELVITT project was its Common module delivery. Two common modules: “Basic teaching skills” and “Computer mediated skills” were offered for students of initial vocational teacher training. All partner institutions having vocational teacher training participated in the common module delivery. The first experience was gained with the guidance of the British team by using Blackboard for the module “Basic teaching skills”. Due to the technical development and free availability of Moodle the consortium decided to examine the inter-compatibility of these VLEs. With Finnish volunteering the next common module delivery was completed for “Computer mediated skills”. Within the framework of *VELVITT*, students of vocational teacher training from Hungary, Great Britain, Finland and Portugal jointly elaborated these two subject modules, with the help of electronic communication. Tutoring the students’ work made it possible to model the learning process in VLE, to examine the communicative efficiency of the electronic learning environment, to see the advantages and disadvantages of the application of discussion board and the criteria for its efficient application as well as the basic types of participation in electronic communication. Making an account of the first results of execution of these competence modules contributed to planning the third project completed by the same consortium: “Masters level Opportunities and Technological Innovation in Vocational Teacher Education”, the acronym of which is *MOTIVATE* (<http://motivate.tmpk.bmf.hu>). The main project processes and products are to be disseminated in this paper.

## **2 The Role and Possibilities of VLE Usage**

Computer mediated communication – such as discussion among study groups, e-mail or synchronous chat – in VLEs proves to be very efficient. It enables students and tutors to develop interactive communication, thus avoiding the risk of isolation involved in on-line learning [4]. Nowadays several established companies are already creating VLE networks internationally. At the same time, however, there are solutions developed at training institutions using inner and usually outer networks, too. The advantage of the former is that due to the normally richer financial background of the developer company the products are many-sided and more professional. They are more expensive for the user and there are more limitations of use. To enlarge the circle of potential customers, generally much more of them are offered than needed by the user, therefore unnecessary excess expenditure appears on the side of the user. Local development usually works on a more modest financial basis and with simpler solutions, and its development demands a lot of time and energy of tutors. At the same time, however, such environment adapts itself very well to concrete needs. Particular demands may occasionally be met by local development only, in an inexpensive way. This circumstance makes local development not only justified but

indispensable as well. The advantage of locally developed electronic syllabuses is that they reinforce relations between training institutions both nationally and internationally. Relationship and co-operation which are really productive and long-term are established almost exclusively by local research and developments.

Combining the services of computers, local networks and the Internet, VLEs provide facilities for the flexible organisation of all aspects of the learning process, both in terms of access to resources and communication with others. The application of VLEs is of great significance to vocational teacher training in many ways:

- ◆ the content of vocational knowledge is rapidly changing; VLEs support a modular structure to the syllabus, which ensures that specific modules or their elements can be easily updated, and which allows efficient tracking of changes in the electronic documents;
- ◆ a major part of vocational teacher training and re-training is undertaken by adults, and the provision by the VLE of training content independent of the place and time of study is advantageous to ‘life-long learners’;
- ◆ the wide-ranging application of information and communication technologies is reflected in the safer handling of the informatics background to vocational services, that is the application of ICT in VLEs enriches ICT content knowledge and promotes its use in the vocational field.

Adequate ICT skills of vocational teachers are essential for the effective application of VLEs in vocational training. This imposes a dual task on vocational teacher training:

- ◆ on one hand, to develop the content of vocational teacher training for the application of ICT ensuring the appropriate emphasis through the content enrichment of educational technology, multimedia and subject methodologies, with a proper acquisition of experience in the field of e-learning and VLEs;
- ◆ on the other hand, to organise in-service training for practising teachers, who have received their qualifications in former years, as well as for teachers taking part in vocational teacher training, while summarising and publicising in the form of distant training the content and methodology changes due to ICT development [5].

### **3 MA Technical Teacher Training Supported by *MOTIVATE***

The success of comparing different types of virtual learning environments in VELVITT project [2] incited the consortium to utilise and expand the results in MOTIVATE project. In what follows we concentrate on the recent achievements of the MOTIVATE project [6].

#### **3.1 Project Aims and Achievements**

The main objective of the MOTIVATE project was to transfer innovatory practices and developments to benefit the two Hungarian higher educational institutions in the partnership (the co-ordinator institution Obuda University, formerly Budapest Polytechnic and the other Hungarian higher educational institution Dunaujvaros College). The innovation was twofold: the introduction of Masters level modules into the technical teacher education programmes and the use of new and emerging technologies in the implementation of the developed curriculum. The innovation provider, the UK partner (University of Huddersfield) had considerable prior experience of development and delivery of Master level professional development courses in technical teacher training.

The main objectives have been realised. During the project lifetime the Master level curriculum for technical teacher training was shaped and finalised in mechanical, electrical and IT engineering fields according to the Bologna process and the Hungarian legal regulations. The two institutions, namely the Obuda University and Dunaujvaros College utilised the expertise of the EU partner institutions. Curriculum development for selected modules included innovative solutions for sharing aims and criteria by using social software and collaborative Web2 technologies. Originally it was planned to use Associated Online UK developed software) but because of additional and unexpected costs the idea was given up. This under-achievement had to be balanced by using other methods to create on-line communities. The Forum platforms of the Moodle virtual learning environment were used when the Teaching Subject Specialist on-line communities have been created. Taking into consideration the large number of participants the solution proved to be an over-achievement, especially in the light that the activities have not stopped at the end of the project but went on without decline and the number of participants increased.

Teachers of engineering were supported by these on-line communities to a great extent. Normally they are professionally isolated in their institutions having nobody or just one or two colleagues who could share their problems. Getting into a larger community where teachers are teaching similar subjects and have similar problems they could overcome the problems quicker and better getting suggestions, ideas and supports from their distant professional contacts.

These on-line communities worked very well within the participating countries using their national language. Without language difficulties large communities were created by the initiatives of technical teacher training students participating in Master level in-service courses. They were not only students of teacher training courses but also technical teachers of secondary schools or polytechnics and universities. Step by step some of their colleagues joined the communities and several problems and ideas were discussed while links and attachments were shared.

The common module deliveries have been realised in the participating institutions using Moodle virtual learning environment. The number of students was limited, because an acceptable level of English communication was required. However, it was a great experience to encourage students of European countries to be active not only in discussions but also in some co-operations related to their academic tasks and assignments. The Case Studies are being disseminated to share the experiences with other technical teacher training institutions.

### **3.2 Outcomes**

The Curriculum for Master level in-service vocational teacher training in mechanical, electrical and IT engineering has been prepared. There are differences in the curriculum according to the national regulation deriving from the higher educational law and accreditation process. However, the new model, which was created by Hungarian institutions benefits from the curriculum of the innovation provider (Huddersfield University) and the best practices of the other participating institutions.

To produce the module specifications and guidelines the project consortium examined commonality in the Master level vocational teacher education curricula of the participating countries and identified modules of the existing curriculum to be objects of innovation transfer. The three modules were as follows: Pedagogy, Multimedia and e-learning, Teaching a Specialist Subject. The module specifications are the specification of subject matters within the institutional curricula, and the guidelines were created for the common modules having been designed for the common module deliveries which were supported by virtual learning environment (Moodle).

In the common module deliveries all partners having technical teacher training participated.

Course material was produced in the form of a textbook on educational technology and multimedia for supporting Master level vocational teacher training in the innovation receiver country (Hungary). The detailed draft was created in English and the final form of the textbook published in Hungarian utilised all the examples of ICT innovations provided by the partner institutions and the reflections given for the draft.

Moodle served as a platform for on-line communities having been created for technical teacher training staff and students on Teaching a Specialist Subject. Individual experiences and innovations were and are still being shared in large communities [1].

The consortium published a book of Case Studies includes technological innovations, master level opportunities, descriptions of common module deliveries and assessment materials of quality management.

The conference proceedings, another publication of project outcomes is a collection of papers presented both in the midterm and the final conferences of the project. It summarises project results, evaluations of curriculum processes and quality assurance reports. Beside the interim and final project conferences, several participations in other European conferences served as opportunities for dissemination.

### **3.3 Outputs Relating to ICT**

ICT served as a pedagogical or management tool. Using the example cited above of Associate Online as a guide, innovative methods both for the management of the project and for the delivery of the new modules were created. The systems used have facilitated the development of vibrant communities of practice for the participants in the project and for the future students of those participants. Competence in the use of these tools will be disseminated across the partnership and the community that is formed will facilitate further collaboration with potential for joint research activities in the future.

ICT was an essential competence to be acquired by staff members, learners or other groups. The ‘Multimedia and E-learning’ common module is a significant component of the Masters level in-service technical teacher training. To develop the ICT competences of learners (teachers of technical secondary schools) is the main goal of the module. ICT skills are developed in local ICT labs and also by web utilisations using the Moodle as a VLE platform when accomplishing assignments by group work.

ICT was and is still being used as a tool for dissemination. ICT has been used for dissemination mostly via the project website and wiki, but also CD ROMs were sent to the management of VET schools and VET teacher training institutions.

### **Conclusions**

Virtual learning environments and networked learning increasingly become key factors in the delivery of training and education in the 21<sup>st</sup> Century. Additionally, there is a great potential to use networked learning environments to enhance pan-European dialogue in engineering education while adding an international perspective to national programmes. Many teachers (groups) suffer from a lack of access to training and development programmes and the increased delivery of

training through networked learning have a direct benefit to them. Networked learning offers the opportunity to deliver training programmes in a flexible and learner-centred way. Both students and teachers can benefit from participation in online communities, both in terms of the consequent access to the kinds of large, vibrant communities of practice required, and in terms of developing skills in the use of Web2 in education. Discussion boards of virtual learning environments provide the opportunity for large scale interactivity: question, answer, remark, argument, feed-back, confirmation may appear in various combinations of tutor-student, student-student, and tutor-tutor co-operation with increased varieties according to the number of tutors and students.

The European collaboration provided an excellent opportunity to analyse research data gathered on the use of different virtual learning environments. Investigating the possibilities of virtual learning environment operation across different platforms contributed to making more efficient virtual learning environment usage. The new internet-based technology supports all types of training and provides exceptional opportunities for in-service and distance learning where on-line communication can be regarded as a new and most efficient tool for disseminating and multiplying individual experiences [7].

Good practices gained as valuable outcomes of technical teacher training EU projects are worth to be extended to a wider area. Examination of profitable experiences may efficiently pay a share of improving the entire of engineering education as well [3].

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