Virtual Learning Approach
in Vocational Initial Teacher Training

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Abstract – **Virtual Electronic Learning in Vocational Initial Teacher Training project aims to develop the use and management of virtual learning environments in the area of vocational teacher training, drawing on a well established international partnership of institutions providing both technical and educational expertise. This paper gives an overall picture of results and products of the collaboration. We touch upon the aims, the assessments and the learning process of using "Basic teaching skills" module in detail. The main cooperative and collaborative devices are presented in virtual learning environment. The communication during collaborative learning, the structured debate on discussion board and the efficiency of collaborative learning in VLE are interpreted at the end of this paper.**

Index Terms – blended learning, collaborative learning, virtual learning environment, vocational initial teacher training

INTRODUCTION

Most of the partners in our recent project have been participating in a former international project (Lifelong Learning in Technical Teacher Training). Towards the end of the previous project we summarized the conclusions of using Information and Communication Technology (ICT) in life long learning.

On one hand new technology has the potential of being able to match structure to the nature of the learning text and to individual learners' needs. On the other hand there is a phenomenon, known as "getting lost in hyperspace". Experience with teaching-learning programs has proved that these programs cannot replace teachers and discussions are irreplaceable.

These shortcomings can be overcome if learning is organized in groups of learners to mix their experience in collaborative group work, which follows supervised independent study. Virtual learning environments integrate the advantages of individual learning and group learning and all the support that can be provided by ICT facilities.

Computer networks allow for virtual presence from remote site, allow presenting course material in highly interactive form and allow presenting questions and get answers within minutes. Both the teacher and the learner can enjoy the privacy in their home environment. Internet due to the World Wide Web provides cheap and easy access to information sources of immense diversity. Interactivity is offered at a large scale and variety. In addition to tools, technology provides drill and exercises for basic skills.

Computer mediated communication – such as the use of discussion groups, email and synchronous chat facilities – is vital to the success of initiatives as they give learners the facility to interact with other learners and tutors and help to overcome the potential isolation which can be the result of learning online. Virtual learning environments allow communication across national boundaries as well.

Recognizing the opportunities of new ICT developments Dr. David Lord and Dr. Matthew Pearson from Huddersfield University (UK) initiated a project supported by their experience on virtual learning environments. In 2003 the project received foundation under the Leonardo scheme from EU. The title of this new project is *Virtual Electronic Learning in Vocational Initial Teacher Training* with the acronym VELVITT. The web-site of the project: http://velvitt.banki.hu. The project is coordinated by Bánki Donát Faculty of Budapest Polytechnic and the consortium is formed by experts from Finland, Greece, Holland, Hungary, Portugal and the UK.

The project aims to develop the use and management of virtual learning environments in the area of vocational teacher training, drawing on a well established partnership of institutions providing both technical and educational expertise. The proposal is submitted as a "Pilot Project" and focuses on the development of a tangible set of products to enhance the quality of initial teacher training in vocational education by making full use of the new information and communication technologies.

RESULTS AND PRODUCTS

1. Establishing the project processes

It was successfully completed and most of the work related to this was carried out at the first project meeting in the UK. This work package covered:

- Confirmation of work packages with partners adding detail to content
- Agreeing completion dates of future work packages
- Establishing the quality assurance framework of the overall project using the two specialist partners

A web-site has been created to aid with the dissemination of the project. This is a resource to provide information to project partners and also to bring the work of the VELVITT project to a wider audience within the Initial Teacher Training community in the EU.

2. Staff development – Teaching using Virtual Learning Environments (VLEs)

In preparation for the second project meeting, partners worked on detailed reports on VLE usage at national, institutional and faculty or departmental level. These reports were presented and validated at the second project group meeting in Finland.

A questionnaire based audit was implemented on concerning all partners with Initial Teacher Training programs. The report of the audit is made public on the project web-site.

The staff development at the participating vocational teacher training institutions has been organized in two periods so far. First in 2003 training activities were conducted in both the UK and Finland during the project meeting. After these initiatives the training program for staff development was designed.

In January 2004 staff development was organized in the other participating institutions utilizing British and Finnish experience with taking into consideration the local circumstances and the survey on staff needs.

The content of staff development includes the basic knowledge in virtual reality, the concept and features of virtual learning environments. During the course basic technical skills and methods for the use of virtual learning environments are developed. Learning new technologies by using them is the main concept of development.

The main stream for providing training on virtual learning environments is the continuing teacher training including the staff of vocational education and training and the staff of training centers.

These experiences and further research on extended data of staff needs supported a deep analysis of staff development needs.

3. Curriculum development – Vocational initial teacher training via VLEs

This package has also been completed. The work includes: harmonizing vocational initial teacher training modules for using VLEs, designing a range of modules using VLEs, namely: Basic teaching skills, Computer mediated skills, and a European collaboration module, preparing specification and documents for the modules, this work was rather complex because of the differing institutional requirements of the partners and the need to provide documentation, which allows for harmonized delivery but which also meets local rules and requirements. The UK partners had a leading role in this process.

4. Course implementation – Common module delivery

The activities of this work package included: organizing the 4th and 5th project group meetings; initial implementation and trialling of modules; the collection of case study data for the electronic learning strategy to be carried out by vocational teacher training institutions. Internal and external monitoring provided feedback on these pedagogical initiatives. As a result of these research data, modules will be modified, teaching material reworked and the experiences of both staff and students analyzed.

5. VLE Inter-compatibility – Technical forum

This concerns the inter-compatibility of VLEs and the technical forum. Tasks being performed in this package include: collating data on VLE usage; contributions to the technical forum; formulating EU level recommendations. In addition material from this work package will feed into the synoptic electronic learning strategy to be completed at the end of the project. This substantial paper based report includes technical papers on VLE choice and implementation and suggestions for EU harmonization.

COMMON MODULE DELIVERY AS A MAIN RESULT OF THE PROJECT

The specifications for modules were prepared. "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 new common module delivery was decided for "Computer mediated skills". Resources can already be reached on the Moodle VELVITT area of Tampere Polytechnic.

Now by the "Basic teaching skills" module we introduce the syllabus of the virtual course and the teaching-learning process in VLE.

I. Aims and Assessments

The module aims are to develop an understanding of the fundamental issues and principles involved in teaching and learning within a specialist and to develop the skills in the design and evaluation of teaching and learning processes and resources.

The Basic Teaching Skills module develops an understanding of ways in which people learn, together with the ability to design effective learning experiences and considers theory and practice relating to the teaching of a vocational subject. It also covers possible approaches to evaluating teaching and learning.

In the case of the module relevant information ("ready knowledge") was placed in the system shell in an electronic format (html, pdf, doc, etc). In the module Basic Teaching Skills the students independently processed the following topics in the course of acquiring information:

- Factors influencing learning (e.g. previous educational experience, motivation, learning style)
- Theories and models of teaching and learning (e.g. adult learning models, experimental and reflective models, cognitive and behaviourist theories, learning styles, motivational theories)
- Basic forms of collaborative learning
- Role of communication and language in teaching and learning
- Barriers to learning
- Opportunities for professional development for specialist teachers and trainers

- Organizations and networks, community-links, the role of teamwork. [1]

Table 1 shows the learning outcomes of would-be-teachers at the end of the module.

TABLE I
LEARNING OUTCOMES OF WOULD-BE-TEACHERS

Knowledge and Understanding	Ability
• demonstrates a basic understanding of theories and models of learning • produces the conditions of efficient collaborative learning • understands the aims and philosophy of education and training in the specialist area • understands the relationship between learning outcomes and the design of teaching and learning • understands the role of IT and other skills in the specialist area	• plans effectively to achieve identified learning outcomes • prepares and selects materials to support teaching and learning • analyses communication within teaching and learning

The students had to produce a portfolio of evidence showing that they had achieved the module outcomes (3.000 – 4.000 words approximately). The portfolio should have contained the following elements

- Plans for learning sessions and/or program of study are appropriate to particular teaching and learning situations, incorporating, where appropriate, IT and other key skills
- Consideration of VLE usage for collaborative learning
- Evaluations of the design and delivery of teaching and learning
- Consideration of fundamental issues and principles relating to teaching and learning within the specialist area
- Evidence of reflection on teaching and learning processes

II. TEACHING AND LEARNING PROCESS

The forms of electronic learning may be interpreted within the framework of traditional and distance learning alike. In the former case the so-called face to face forms of education are combined with the Internet-based learning environment. In the course of processing the modules Basic Teaching Skills we realized the form of learning referred to as "blended learning" in the technical literature. Virtual classroom is defined as the entity that associates a course with one or more students and one or more tutors/mentors/facilitators with the purpose of reaching some common educational goals (realization of course). Virtual classrooms use the services of the system to reach these goals.

TABLE II
ACHIEVEMENT OF THE COMMON MODULE – BLENDED LEARNING

Week	Classroom (Face to face) Training	Virtual learning
1	Introduction of VLE and content of given module	-----
2	Presentation of module aims, learning strategies and assessments Introduction of the content and format of the expected portfolio Talk about electronic based communication via discussion board	------
3-6	------	Active participation in debate in discussion board Discussion about lesson planning
7	Discussion about connections between chosen teaching methods and learning styles	------
8-10	------	Active participation in debate in discussion board Discussion about lesson planning
11	Individual consultation about lesson planning and collaborative learning methods	------
12-14	------	Active participation in debate in discussion board Discussion about lesson planning
15	Evaluation	------

Besides the cognitive activity of electronic communication and knowledge acquisition, in the course of processing the modules Basic Teaching Skills as a result of Blended Learning, students had an opportunity to try the following types of face to face cognitive activities: classroom practice – between students and the teacher/tutor (5 times per term), tutorial – between the student and the teacher/tutor, or between the student and a student (collaborative learning), school teaching practice – between the student and the comprehensive school mentor (Table II). These traditional forms of communication created an opportunity to debate in detail the syllabus to be processed, to discuss the questions arising during the solution of problems as parts of the portfolio, and to exchange experience gained during the teaching practice and relevant from the point of view of the module.

Basic teaching methods in common module - Blended learning a combination of classroom-based training with self-paced e-learning):

- Classroom-based training: lectures with explanation and interpretation, seminars, discussions, group-work (e.g. analyzing and comparing a given VLE system), individual working with teacher leading/under teacher guidance (e.g. first steps in given module)
- Self-paced e-learning: participation in email and discussion board communication, leading the debate, uploading new reference, collaboration in learning

The most important teacher instructions in the virtual teaching-learning process are the following: interpretation of blended learning, giving viewpoints for analyzing VLEs in

general and the given module, assistance in theme choice, analyzing the chosen theme from the point of view of knowledge elements (e.g. concepts), interpretation of the domains of learning (e.g. cognitive, psychomotor and affective), thinking about possible teaching methods, teaching materials, didactical tasks and constitutional and contribution forms, giving information formats and contents of portfolio, adding new questions to the discussion, encouraging non-communicative ("shy") students to participate in debate, calling students' attention to adequate articles, bringing relevant learning materials to students. [2] [8]

COOPERATIVE AND COLLABORATIVE LEARNING

Self-directed studying must not be mistaken with independent studying that the student does on her own without supervision or contact with fellow students. Moreover, a clear distinction needs to be made between using the Internet as a channel for distributing material and teaching an online course. One of the clear strengths of an online course is the opportunity for adding the element of social networking to distance learning. The teacher has got an essential role in this, but also ways of interacting with other learners should be provided. Gilly Salmon points out the groups of learners always tend to exchange views and ideas, and that people enjoy learning from the experience of others. She emphasizes that to offer these benefits to learners, a considerable amount of group work needs to be included within any learning program.

Salmon makes a distinction between cooperative and collaborative learning – whereas cooperation involves a group helping each other towards individual goals, collaboration refers to a group working together towards a common goal. She strongly emphasizes the significance of this type of learning:

"Collaboration requires an active sharing of information and intellectual resources amongst the participants. The best experience of collaboration by participants for learning purposes enables them to experience both personal, individualistic, useful learning whilst contributing to a community of learners and the support and development of others…participants can comprehend, evaluate, debate, question, integrate and synthesize information online, with suitable e-tivities and ongoing support." [3]

It could thus be suggested that teaching online at its best can combine the finest features of both classroom teaching and independent studying. It frees the student from the strict constraints of time and place and thus enables studying also for those who, for one reason or another, could not attend a schedule-tied course. However, the student is not left alone with the course book – the support and resources of the group are constantly present, and in addition to that, the teacher is there to answer questions and give advice. [4]

COOPERATIVE AND COLLABORATIVE DEVICES OF VLE

According to constructivist pedagogical approach learning environments should keep the activity, intentionality and collaboration for students.

Activeness means that the student is in a key role in her own learning. She is actively engaged in the learning process, processing information. Activeness leads to students taking responsibility in their learning.

Intentionality refers to the learners' active attempts to achieve a cognitive goal. Striving to reach the goal makes the learner think – and thus also learn – more.

Collaboration comes from the students' natural tendency to form communities in which the members can benefit from each others' skills and social support.

The most VLE system has some communicative and non-communicative elements for collaboration.

1. Chat
The Chat module allows participants to have a real-time synchronous discussion via the web. This is a useful way to get a different understanding of each other and the topic being discussed - the mode of using a chat room is quite different from the asynchronous forums. The Chat module contains a number of features for managing and reviewing chat discussions.

2. Forum
This activity can be the most important - it is here that most discussion takes place. Forums can be structured in different ways, and can include peer rating of each posting. The postings can be viewed in a variety for formats, and can include attachments. By subscribing to a forum, participants will receive copies of each new posting in their email. A teacher can impose subscription on everyone if they want to.

3. Assignment
Assignment allows the teacher to specify a task that requires students to prepare digital content (any format) and submit it by uploading it to the server. Typical assignment includes essays, projects, reports and so on. This module includes grading facilities.

4. Workshop
A Workshop is a peer assessment activity with a huge array of options. It allows participants to assess each other's projects, as well as exemplar projects, in a number of ways. It also coordinates the collection and distribution of these assessments in a variety of ways.

COMMUNICATION DURING COLLABORATIVE LEARNING

In this chapter online communications will be introduced by focusing on text-based computer communication, e.g. via discussion board. Discussion board (Forum) is commonly provided in VLEs, such as Blackboard or Moodle. They provide the facility for students and tutors to hold discussions and contact each other in the same group. This method is similar to the regular e-mail system, but there is a difference. Discussions are threaded, in other words, the relationship between the message and the responses posted to it are displayed graphically on the screen in a way that gives a meaningful structure to a discussion or activity. Discussions are also recorded, enabling students and the tutor to return to them. The discussion board is a "virtual

forum", which shares individual student questions with the whole group.

Evaluating the role of discussion board in electronic based communication we can notice that there might be new roles of students and teachers/facilitator/ mentor/tutor.
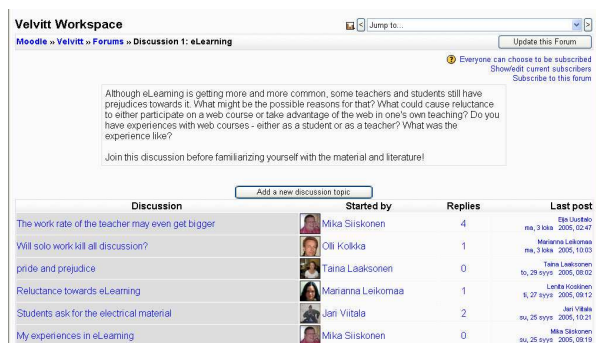

FIGURE 1
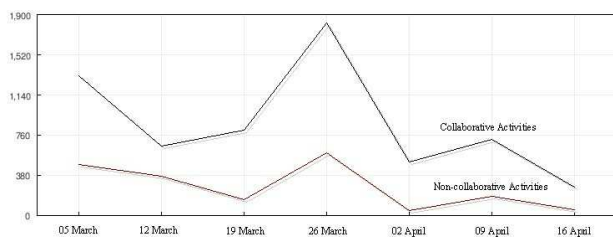DISCUSSION BOARD IN BASIC TEACHING SKILLS MODULE

FIGURE 2
LEARNING ACTIVITY

Summarizing these, discussion board allows students to contact tutors on an individual basis, to collaborate on and share tasks, including the exchange of files, to provide each other with feedback, to raise questions, to participate in open discussion, to share experiences, ideas and resources.

It allows teachers to contact students individually, to provide an answer to an individual question to all students, to facilitate collaborative discussions and activities, to upload electronic teaching materials, to provide reminders and information.

On the evidence of our experience the benefits of using discussion board in virtual learning by collaboration are as follows:

- the flexibility of participation in learning any time, any place
- the disadvantage of this flexibility is a lack of immediacy, since students may have to wait for responses and feedback, which might result in loss of motivation
- discussions/contributions are recorded, which enables students and tutors to return to review activities or access answers to queries by others
- the development of important transferable skills, for example, discussion boards may facilitate the development of "virtual" written discussion skills, potentially linking to key skills for vocational initial teachers

FIGURE 3
STUDENT LOYALTY

Figure 1-3 show vocational initial teachers' activities in Basic Teaching Skills module. Fig. 3 tracks the number of visits by visitor frequency. The number of visits by students who never returned (no loyalty) are symbolized on the left of the histogram. The number of visits by visitors who returned over 200 times (very loyal) is indicated on the far right.

STRUCTURED DEBATES ON DISCUSSION BOARD

Structured debates using discussion board can be a useful way to develop students' analytical and academic discussion skills. Each student can be assigned a role in the debate:

- *The moderator*'s role is to set the overall scene for the discussion, to encourage initial comments on the proposer's and opposer's messages, to encourage "shy" students to contribute, to keep the discussion on track.
- *The opposer*'s role is to counter the proposer's message by posting a message arguing for the opposite point of view, again in such a way as to encourage further comment.
- *The proposer*'s role is to post a short message to the discussion board, making a case for the proposition in such a way as to encourage comment from other group members.
- *The documentalist*'s role is to summarise one or more of the set readings for the topic, picking out the points relevant to the proposition, and contribute the summary to the discussion thread.
- *The researcher*'s role is to go out and find other relevant readings and resources, from the Web and from the set books, and bring them to the attention of the group.
- *The rapporteur*'s role is to prepare a summary of the overall debate and post it to the discussion board for comments by the group, at the end of the debate.
- *The commenter*'s role is to comment on the ideas put forward by all of the above and help keep the discussion going.

EFFICIENCY OF COLLABORATIVE LEARNING IN VLE

According to our experiences of using the Discussion board of VLE in teaching-learning process it could be absolutely necessary to discuss the following questions and comments carefully:

- It is important to consider why the online discussion board is used within a course and how it relates to the learning outcomes. E.g. to develop students' written and

discussion skills, collaborative or group working skills, etc. or to extend their contact time on face-to-face course (blended learning).

- It is well-known that, the would-be-teachers are increasingly having a higher level of IT skills and searching available and appropriate information on Web. But it is important to establish and plan how future teachers will be supported throughout their engagement with online learning, such as with induction ongoing support, and to deal with any assessment issues that need to be address.

- By teaching online we will not have the same feedback that we get in face-to-face teaching to indicate how our students are progressing in knowledge, understanding and abilities. In every pedagogical situations there are some students with highly or shortly developed verbal or non-verbal communication skills. Because of this we need to encourage our students to seek feedback, guidance and clarification proactively, both from us and from each other. Being necessary to establish clear guidelines on length, number and style of student communication, response timetable from teacher/tutor/mentor and the nature of teacher involvement, namely clear guidelines on the nature of participation will be important to achieve that.

- The students (now would-be-teachers) with different first language may have communication problem in English, which leads to misunderstandings and lack of motivation to participate. So it is very important to help overcome misunderstandings and ensure that learners have a shared approach to communicating online, make sure we devote some time and support to encouraging a common use of language.

- The composition of the student group plays very important role in electronic communication similar to face-to-face one. Many factors, such as ability of the group members, group size define the efficiency of our common work. "Too large group may lead to free-riding or 'lurking', and too small group may suffer from the lack of different views or particularly in an online situation, a critical mass for a lively discussion." [5]

- The social dimension of learning is particularly important when considering online communities of blended learners. In this dimension of discussion board the mentor need to recognize learners as creative and active producers, and that learners control of the structure of their learning environment is important for both learning and effective socialization. This is difficult to achieve in some discussion board system, e.g. in Blackboard or WebCT, so it might be necessary to allocate an alternative discussion board for students to chat to each other without any tutor involvement. [6]

CONCLUSION

Educational planners need to be aware of the fact that new technologies have as much potential for wasting time and money as they have for inducting progress. Nevertheless, we also have to keep in mind that "we cannot afford not to go up this slope if everybody else goes up" as Padfield said in the Budapest meeting of the Working Group on Continuing Engineering Education. [7]

Many teachers (groups) suffer from a lack of access to training and development programs and the increased delivery of training through networked learning will have a direct benefit to them. Networked learning offers the opportunity to deliver training programs in a flexible and learner-centered way.

The European collaboration provides an excellent opportunity to analyze research data gathered on the use of different virtual learning environments. Investigating the possibilities of virtual learning environment operation across different platforms contributes to making recommendations for future EU harmonization regarding virtual learning environment usage. Virtual learning environments and networked learning will increasingly become key factors in the delivery of training and education in the 21st century.

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