

**AC 2009-2533: UTILIZATION OF COOPERATIVE AND COLLABORATIVE
LEARNING IN TECHNICAL TEACHER TRAINING AND ENGINEERING
EDUCATION OVER NATIONAL BOARDERS**

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Utilization of Cooperative and Collaborative Learning in Technical Teacher Training and Engineering Education over National Boarder

Abstract

The Masters level Opportunities and Technological Innovation in Vocational Teacher Education 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 “Multimedia and e-Learning: e-learning methods and tools” module in detail. The main cooperative and collaborative devices are presented in virtual learning environment. The communication during collaborative learning, the structured debate on forum and the efficiency of collaborative learning in VLE are interpreted at the end of this paper.

Preliminaries

At one of the legal predecessors of the Centre for Teacher Training and Engineering Education of Budapest Polytechnic, at the Institute for Engineering Education, an electronic syllabus package of four modules was developed in 2004 as a result of a project supported by “Apertus” Public Foundation (project leader: *Dr. Péter Tóth*). The objective of the project realised under the leadership of one of the authors was the development of an electronic syllabus package with unlimited availability in space and time together with accompanying methodological aids in the topics of education technology and multimedia. The main areas of the application for the syllabus package are teacher training and in-service teacher training as well. As a result of the project, the processing of the education technology and multimedia syllabuses was completed in distant teacher training and took place in a blended form in full time teacher training. At the beginning of the term students received the electronic syllabus on CD first and later also in a form downloadable from an FTP server.

The electronic syllabus package was comprised of the following parts:

- Basic skills module: it presents the basic terminology of educational technology and multimedia development and expectations towards such materials.
- Editing Individual media module: its purpose is to learn the skills necessary for the activities related to the planning and editing of digital media. This module consists of two parts. One presents the tools of editing time-independent (images and figures) while the other those of time-dependent (audio and video) media.
- Multimedia Editing module: to learn the skills related to Authorware shell necessary for the development of e-learning software.

Two methodological aids were also developed to accompany the syllabus modules. Students of technical teacher training taking part in the training may, after graduation, participate in adult retraining and in-service training, too, where electronic-based distance learning may play a decisive role. Therefore we considered it important to elaborate recommendations helping the teacher’s (tutor’s/instructor’s) work, which process methodological questions in connection with

the development and application of electronic syllabi. In addition, a methodological guide was developed to provide more information about the individual characteristics of independent learning, with a decisive role in adult education, as well as a questionnaire to assess and evaluate learning styles.⁷

The other project relevant to our research set as its aim the pedagogical and methodological examination of the adaptability to teacher training of virtual learning environments. The specific aims of this project are

- to develop a methodology for assessing institutional requirements for networked learning and for selecting and implementing appropriate solutions, including the choice of VLE;
- to create staff development and training programs to support the management and use of virtual and networked learning;
- to increase trans-national collaboration in vocational initial teacher training and develop capacity to deliver programs where this takes place;
- to investigate the specific application of VLEs in vocational initial teacher training, and to revise curricula to maximise benefits to teaching and learning processes;
- to compile and analyze data comparing various VLEs, and to disseminate this with a view to standardizing policy in vocational initial teacher training.⁷

As a result of the "Leonardo da Vinci" project led by *Dr. Pál Pentelényi* and realized in an international co-operation (involving Hungary, Finland, England, the Netherlands, Portugal and Greece), the following three electronic syllabus modules were developed: Basic Teaching Skills, Computer Mediated Skills and European Collaboration. These competency modules were integrated with BlackBoard and Moodle systems. Students of technical teacher training from England, Finland, Portugal and Hungary collaborated in processing the syllabus. Tutoring students' work created an excellent opportunity to get to know and analyse a virtual learning environment. More can be read about the results of the project "Virtual Electronic Learning Vocational Initial Teacher Training" (VELVITT) on the homepage velvitt.banki.hu and in the publication edited by Pál Pentelényi.⁴

Background of a New Leonardo Project

The Masters level Opportunities and Technological Innovation in VocAtional Teacher Education (MOTIVATE) project transfers innovatory practices and developments to benefit the two Hungarian higher education institutions (Budapest Tech Polytechnical Institution, College of Dunaújváros) in the partnership. The innovation is twofold: the introduction of Masters level modules into the vocational and technical teacher education programmes, and the use of new and emerging web technologies in the implementation of the developed curriculum (Advanced Pedagogy, Multimedia and e-learning, Teaching a specialist subject). The other partners of the consortium (University of Huddersfield, Tampere Polytechnic, Technological Educational Institute of Crete, Fontys University of Applied Science, University of Lisbon) have the necessary expertise to provide this innovation. The UK partner, with considerable prior experience of development and delivery of Masters level professional development courses in the vocational education and training (VET) field, is the main provider of the innovation. All partners have a wide experience of VET curriculum development and technological innovation in its delivery. Tangible outcomes include development of common quality criteria for the

qualifications and professional development of VET teachers and trainers in different learning environments and common core criteria for identifying their learning needs.

Innovative solutions for sharing aims, objective and criteria include the use of social software and collaborative Web 2.0 technologies which facilitate the creation of a new online community of European partners. The possible platforms for the community could be Moodle, Wetpaint Wiki, Second Life. The new generation e-learning is used to refer to new ways of thinking about e-learning inspired by the emergence of Web 2.0. From an e-learning 2.0 perspective, previous e-learning systems were based on instructional packets that were delivered to students using internet technologies. The role of the learner consisted in learning from the readings and preparing assignments. Assignments were evaluated by the teacher. In contrary, the 2nd generation e-learning places increased emphasis on social learning and use of social software such as blogs, wikis, del.icio.us, etc. This phenomenon has also been referred to as Long Tail Learning. The new theory in social learning replaces the traditional view of knowledge and learning. The new perspective that underpins the previous electronic-based learning assumes that knowledge is a kind of substance, so it can be packaged using instructional methodologies in order to be delivered and transferred to the learners. In contrary, new generation e-learning assumes that knowledge is socially constructed.

Intangible outcomes of the project include the potential to disseminate the expertise gained in order to widen this community so that it can encompass new partners or involve trainee teachers across different institutions and countries in similar collaborative efforts. One particular advantage would be the development of Subject Specialist communities for VET teachers that, because of the reach of internet based technologies, can facilitate much larger groups of subject specialists than are possible in face to face contexts.

Project Aims and Objectives

The specific aims of the project are:

- to develop a methodology for assessing the institutional requirements for development of Masters Level VET qualifications
- to adapt Atwell's common framework for VET professionalization to address these institutional requirements
- to develop parallel Masters Level VET qualifications in each of the partner institutions in order to support lifelong learning and professionalization in the sector.
- to utilise Web 2.0 technologies to facilitate these developments
- to create staff development programmes to support the use of these technologies

This project aims to build on the work of those who have sought to identify common criteria and a working framework for the professionalization of VET^{1,2} and to implement such a framework in a number of institutions across Europe. To this end, it seeks to develop parallel VET qualifications at Masters Level in each of these institutions, working from an agreed common framework. In order to support lifelong learning, the resulting qualifications will be made available as training opportunities for both initial trainees and as continuing professional development for existing VET professionals.

Innovations at the University of Huddersfield in the UK include the application in teacher education of Web 2.0 technologies (such as social bookmarking, social networking, blogs, wikis and Second Life) and the creation of a national collaborative platform called Associate Online.

This platform facilitates the formation of large, online subject specialist communities, allowing the geographically dispersed cohort to identify and interact with other VET professionals working in a similar field to their own. Similarly, developments in Finland in the provision of video conferencing will contribute to the project. The project will exploit the opportunities presented by these innovations, using them to facilitate collaboration between the project partners, and in the longer term, between the students of the partner institutions.

Target Groups and Potential Users

The project addresses the needs of training providers and their cohorts to facilitate lifelong learning and enable increased professionalization of VET education and training, identified by the EUROPROF project and by subsequent researchers. *Atwell* noted “an imperative to seek and develop new methods for collaboration and co-operation” since the fragmentation he documented “limits the possibility for formal co-operation between governing and regulatory bodies.” In addition, the limited mobility of VET teachers, the different national requirements to which they are subject and the cultural and language barriers extant between them, mitigate against student exchange. Development of parallel qualifications and online strategies for exchange between these client groups will ameliorate the effects of these barriers and facilitate the sharing and development of expertise in the field. Skills acquired in the use of these modes of collaboration can also be used to address the need for further comparative research also identified by *Atwell*.¹

Atwell's 11 points for a common Masters level framework will be reconsidered in the light of more recent curriculum changes and analysis by the project team of the current curriculum at each of the partner institutions. This will allow the project team to adapt the 11 points to ensure they provide a flexible framework that will nonetheless support parity and comparability of Masters Level work across the partnership. In particular the project will seek to develop modules in areas of perceived shortfall in the recipient institutions, such as mentoring and the use of multimedia in Education.¹

Students training to be vocational teachers will be the direct beneficiaries, in terms of increased opportunities for lifelong learning and the scope to gain higher qualifications for continuing professional development. They will also 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 Web 2.0 in education.

This expertise will enable VET professionals to exploit new technologies in their own teaching, making the students of these individuals the indirect beneficiaries of the project. Very many of the young people who will be taught by current VET trainees are digital natives; that is, individuals who do not know what it is like to live in a world without mobile technology, myspace and digital gaming environments. In order to meet the expectations and requirements of this emerging group, VET professionals will need to develop the knowledge and skills to exploit the affordances of the digital world.

Whilst the project partners are drawn from across Europe with considerable socio-economic and cultural diversity, the wider audience for the project will be pan European, including all providers of training for VET professionals. The project will provide models both for collaboration and for curriculum development for these institutions.

Cooperative and Collaborative Learning by 2nd Generation Web Technologies

Web 2.0 is a term describing changing trends in the use of World Wide Web technology and web design that aims to enhance creativity, secure information sharing, collaboration and functionality of the web. Web 2.0 concepts have led to the development and evolution of web-based communities and its hosted services, such as social-networking sites, video sharing sites, wikis, blogs etc. In this chapter we give the pedagogical background and present the most important element of it.

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.

Collaboration in education means that two or more co-equal individuals/students voluntarily bring their knowledge and practices together by interacting toward the common goals in the best interest of students' needs for the improvement of their educational success.

Collaboration equipment can be divided into three categories depending on the level of collaboration such as communication tools, conferencing tools and collaborative management tools.³

Electronic communication tools send messages, files, data, or documents between students or student and teacher, and hence facilitate the sharing of information.

- *Email* is a store-and-forward method of writing, sending, receiving and saving messages over electronic communication systems.
- *Synchronous conferencing* is the formal term of online chat technologies (e.g. IRC). It has arisen at a time when the term chat had a negative connotation. Today it is occasionally also extended to mean audio, video conferencing or instant messaging systems, given they provide a text-based multi-user chat function. The word synchronous in this case is not to be considered a technical term, but rather describing how it is perceived by humans – chat happens in real time before your eyes.
- *Wiki* enables participants to work together on web pages to add, expand and change the content. Wikis are often used to create collaborative websites and to power community websites, e. g the collaborative encyclopedia “Wikipedia” is the best known wiki.

Electronic conferencing tools facilitate the sharing of information, but in a more interactive way.

- *Instant messaging* is a form of real-time communication between two or more students mainly based on typed text. The text is conveyed via computers connected over the Internet.
- *Chat* allows participants to have a real-time synchronous discussion via the web. This is a useful way to get a different understanding from each other and also get 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.

- *Forum* takes place for discussion. A forum can be structured in different ways, and can include peer rating of each posting. The postings can be viewed in a variety of 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.
- A *videoconference* is a set of interactive telecommunication technologies which allows two or more locations to interact via two-way video and audio transmissions simultaneously. It has also been called visual collaboration and is a type of groupware.
- *Workshop* is a peer assessment activity with a huge variety of options. It allows participants to assess each other's project achievements, as well as exemplar projects, in a number of ways. It also co-ordinates the collection and distribution of these assessments in a variety of ways.

Collaborative management tools facilitate and manage group activities.

- *Knowledge management* comprises a range of practices used by communities to identify, create, represent, distribute and enable adoption of what it knows, and how it knows it. E.g. the knowledge mapping is commonly used to cover functions such as a knowledge audit (discovering what knowledge exists at the start of a knowledge management project), a network survey (mapping the relationships between communities involved in knowledge creation and sharing) and creating a map of the relationship of knowledge assets to core teaching-learning process.
- *Social software* allows users to interact and share data. This computer-mediated communication has become very popular with social sites like MySpace and Iwiw, media sites like Flickr and YouTube, and commercial sites like Amazon.com.

Common Module Delivery as a Main Result of the Project

The specifications for module were prepared. “Multimedia and e-learning: e-learning methods and tools” was offered for students of initial vocational teacher training. Almost 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 Associate Online for the module “Researching multimedia in education”.

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 “Multimedia and e-learning: e-learning methods and tools”. Resources can already be reached on the Moodle VELVITT area of Tampere Polytechnic (moodle.tamk.fi).

Now by the “Multimedia and e-learning: e-learning methods and tools” module we introduce the syllabus of the virtual course and the teaching-learning process in VLE.

I. Aims and Assessments

The aim of the course is to introduce the learner to different methods and tools used for e-learning. The learner finds out what can be done with different tools, how they have developed

and what the future trends in e-learning tools might include. The learner is not given ready answers but is encouraged to evaluate critically the uses, functions and relevance of the tools and methods from the viewpoint of their own work. The approach is not merely tool-centered, but also the changes in the conception of knowledge and learning that are currently taking place in the modern information society are discussed. The relation between the changing conceptions, changing tools and the need for change in pedagogical thinking is considered.

In the case of the module relevant information (“ready knowledge”) was placed in the system shell in an electronic format. In the module “Multimedia and e-learning: e-learning methods and tools” 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 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.⁶

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

Table 1
Learning Outcomes of Would-be-teachers

Learning Outcomes	
<i>Knowledge and Understanding:</i>	
1	Critically understands the possible transformations to teaching and learning brought about by the use of ICT
2	Demonstrates an in-depth knowledge of techniques and strategies for researching the use of multimedia in teaching and learning
<i>Abilities:</i>	
1	Applies multimedia and interactive content for use within teaching and learning with originality
2	Selects suitable technologies for application in a specific teaching and learning context appropriately from a range of ICT based approaches with reference to current developments
3	Researches innovations in teaching and learning using an methodologies derived from action research approaches
4	Evaluates critically a range of technology based approaches to teaching and learning

The students had to produce a portfolio of evidence showing that they had achieved the module outcomes (2.500 – 3.000 words approximately). The portfolio should have contained the following elements (project + evidence of reflection)

- 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

During the teaching and learning process all students have to prepare a project work as well, in which the learners analyse the impact of the tools and theories introduced during the course in their own teaching and make a course plan including pedagogically relevant use of e-learning tools.

Assessment Criteria:

1. The mini projects will demonstrate

- integration of a range of ICT tools and techniques creatively into current teaching practice.
- evaluation of the use of ICT to support teaching and learning and make sound judgements about its use.
- synthesis of theoretical ideas and current debates around teaching and learning using ICT.

2. The essay will demonstrate

- the use of an ICT technique creatively, making sound judgements about its educational effectiveness.
- synthesis of current practices and debates about the role of ICT
- critical understanding of theoretical perspectives on use of ICT to enhance teaching and learning.

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 “Multimedia and e-learning: e-learning methods and tools” 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.

The course is divided in four modules (Table 2), all of them introducing new tools and methods of e-learning. Each module also introduces a pedagogical theory and gives tips and ideas of its possible use in an e-learning context. The themes proceed in a chronological order; the most common, long-established and familiar tools are introduced first whereas the last module offers a glimpse of future trends in the field of e-learning.

Each module contains learning tasks related to the topic. Assignment types vary from discussions and group activities to individual written tasks. The emphasis, however, is on collaborative learning. At the end of the course the learners submit an individual essay in which they analyze

the impact of the tools and theories introduced in their own teaching and make a course plan including pedagogically relevant use of e-learning tools.

Table 2
Achievement of the common module

Week	Contents, tools	Pedagogical consideration	Learning task
1	Introduction		
2-4 Module 1	VLEs Electronic mail, instant messaging Discussion forums (student/teacher roles) Video conferencing - chat (Marratech + Moodle-chat)	collaborative learning, communication (synchronous / asynchronous)	Participation in an online discussion. Considering e-learning tools and methods, where do you stand now? How about in 5 years? Will things change? How? What causes the changes?
5-7 Module 2	Blogs (Introduction, online identity and presence, finding existing resources) Wikis - wetpaint Podcasts	Progressive inquiry / distributed expertise / collaborative knowledge construction	Evaluating changes in the conceptions of knowledge and learning. The learners watch related videos and participate in an online discussion. They write an evaluative summary of the topic in small groups through a wiki.
8-10 Module 3	Flickr YouTube Second life Delicious Facebook / MySpace / Ning VoiceThread for narratives	Narratives in teaching and learning	Exploration of Flickr / YouTube / Second Life or some other application the learner has not used before. The experiences and observations are shared and discussed in the online learning environment. Each learner must also come up with at least three ideas of how they could use some of the tools in their own teaching. The ideas are commented on and possibly further developed by the group.
11-13 Module 4	Google applications (other than the search engine) Mobile learning / Ubi PLEs - portfolios, life-long learning. e-literacy	Changing conceptions of teaching and learning. Teacher's need for lifelong learning.	A discussion concerning the necessity of VLEs. VLE vs PLE. How will things change? What does it mean in one's own work?
14.	Evaluation		

Communication during Collaborative Learning

In this chapter online communications will be introduced by focusing on text-based computer communication, via Moodle Forum. Forum is commonly provided in VLEs, such as 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 Moodle Forum is a “virtual market”, 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/tutor.

Join the discussion about e-Learning tools and methods. Where do you stand now? Which tools and methods are you using now? What do you think about the pedagogical added value in using them? Have these tools and methods changed the way you see yourself as a teacher or a student?

How about 5 years from now? Use your imagination and think of possible scenarios regarding the use of education technology in the near future. Will things change? How? What causes the changes? How does this reflect in your work?

In addition to writing an entry of your own, please comment on at least 2 students' ideas. Of course, the discussion may continue for as long as you wish!

[Add a new discussion topic](#)

Discussion	Started by	Replies
E-learning, now and future	Morad Azizi	10
eLearning usage at companies	Zoltan Palffi	3
Feedback of Moodle	Anna-Liisa Karjalainen	5
Experiences at Budapest Polytechnic	Péter Toth	9
A block in the way of web 2.0	Mate Marot	5
Network-based interrogation	Istvan Kannai	13
eLearning methods now and in the future	Veikko Kärrnä	2
VLE	Anna-Liisa Karjalainen	7

Figure 1
Forum in “Multimedia and e-learning: e-learning methods and tools” module

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 would-be-teachers

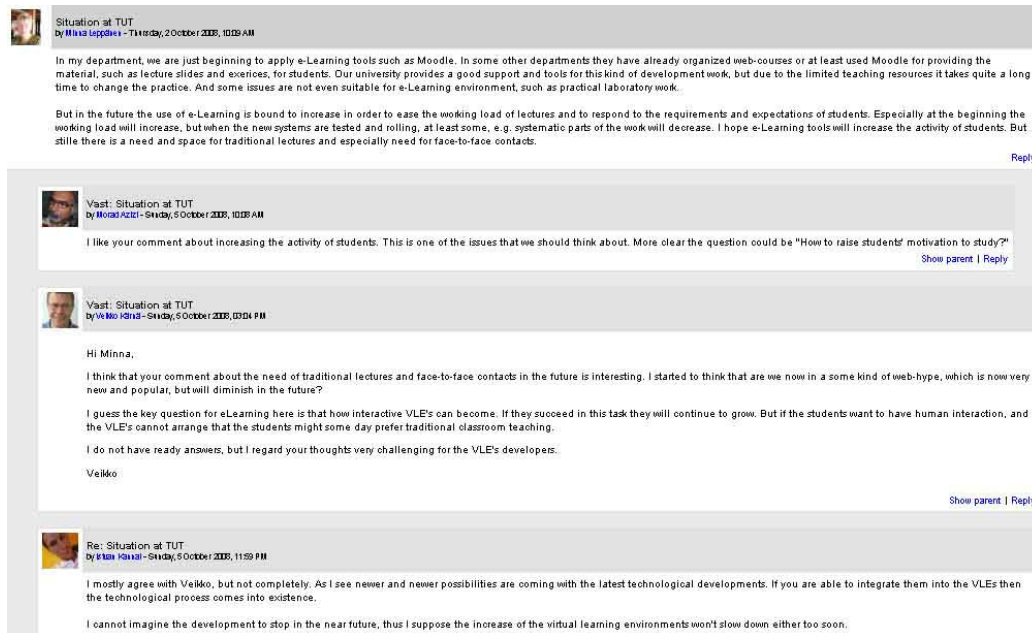


Figure 2

Reflections in the Forum of “Multimedia and e-learning: e-learning methods and tools” module



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 summarize 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 situation 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.”⁸
- 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.⁹

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 inducing progress. Nevertheless, we also have to keep in mind that “we cannot afford not to go up this slope if everybody else goes up”.

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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