Collaborative learning in a VLE based common module

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Abstract: The Masters Level Opportunities and Technological Innovation in Vocational Teacher Education project (http://motivate.tmpk.bmf.hu/) 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 the first results and products of the contribution. The author touches upon the goals, the assessments and the learning process of using "multimedia and e-learning: E-learning methods and tools" module in details. The main collaborative tools in virtual learning environment from point of view of pedagogical approach are presented. The communication during collaborative learning, the structured debate on forum and the benefits of collaborative learning in VLE are interpreted at the end of this paper.

Key words: technical teacher training; virtual learning environment; collaborative learning; on-line dialogue; workshop

1. Pedagogical background of collaborative learning

According to constructivism theory, the learning is a process in which the learners construct new ideas or concepts based upon their current and past knowledge or experience. Constructivist learning approach can be interpreted in social dimension as well. Social constructivist theory emphasizes that knowledge is constructed when individuals engage socially in talk and activity about shared problems or tasks. In this learning situation the student has to collaborate and cooperate with his group partners in a traditional or virtual classroom. In a collaborative learning situation, learners engage in a common task in which each individual depends on and is accountable to each other. Groups of students work together in searching for understanding, meaning or solutions or in creating an artifact of their learning such as a product (Smith, B. L. & MacGregor, J. T., 1992).

Collaborative learning also has a particular meaning in the context of Virtual Learning Environment (VLE) as well. It refers to a collection of equipment which students can use to assist, or be assisted by others. Such tools include virtual classrooms (e.g., videoconferencing), chat, discussion board (forum), wiki, workshop, document (e.g., slide, video, text, etc.) and sharing, among many others (Anderson, C., 2006).

From point of view of pedagogical perspectives on-line communication (also known as on-line dialogue) can be described certain models. According to Laurillard (Laurillard, D., 2009), the dialogue between tutor and student is seen as central to learning. Her conversational model based on earlier theories of Vygotsky. Laurillard emphasizes that, for higher level learning, on-line dialogue must take place at both theoretical and practical levels. One of the major features of her model is the manners in which the learner and tutor interacts. In classical

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face-to-face teaching-learning process, many of these interactions are spontaneous and intuitive that they can be overlooked in the design of technology supported teaching and learning system. In her theory, effective on-line dialogue can be:

(1) Discursive (also known as communicative), namely teachers and students must agree on learning goals and task, teachers and students conceptions should be accessible to each other, and finally teachers must provide environment within which students can act on, generate and receive feedback on descriptions appropriate to topics and goals;

(2) Interactive, namely teachers must provide feedback to learners based on their tasks and conceptions;

(3) Reflective, i.e., teachers should support and encourage process where learners relate tasks and experiences to the topics and goals;

(4) Adaptive, namely teachers must use feedback on learners' conceptions and discussions to revise focus of dialogue (Laurillard, D., 2002).

Laurillard investigates both types of on-line teaching-learning process, and types of learning technology in terms of which these interaction types are supported:

(1) Learning through "acquisition" (tutors' conceptual knowledge → learners' conceptual knowledge);

(2) Learning through "discussion" (tutors' conceptual knowledge ↔ learners' conceptual knowledge);

(3) Learning through "discovery" (tutors' constructed knowledge ↔ learners' experiences ↔ learners' conceptual knowledge);

(4) Learning through "guided discovery" (tutors' conceptual knowledge → learners' conceptual knowledge ↔ learners' experiences and tutors' conceptual knowledge ↔ tutors' constructed knowledge ↔ learners' experiences) (Laurillard, D., 2002).

Another theory of the use of discussion board in Virtual Learning Environment is Gilly Salmon's five-stage model (Salmon, G., 2002). The first two stages (access and motivation, online socialization) focus on acclimatising the learners to the online environment and developing a supportive social environment. The third stage (information exchange) is characterized by learners' interacting with learning materials and activities on-line and providing each other with further resources. In the fourth stage (knowledge construction) learners can work collaboratively sharing ideas, raising problems and challenging each other in an examination. At the fifth stage (development) learner takes responsibility for and reflects on his or her own learning (Salmon, G., 2002).

A next efficient collaborative tool of VLEs for common work is wikis. Teachers can engage students by using this tool to create a virtual space for development of essays or projects. Students can give their reflections, share information or ideas and develop common work. Students working collaboratively on these can use wiki spaces as a depot for note taking, or to learn from other students' ideas or results. Students themselves can edit the content in wiki platform as well.

2. About 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 Dunaujvaros) in the partnership. The innovation is twofold: the introduction of Masters level modules into the vocational and technical teacher

education programs, 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). 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 developments 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 and 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 the 2nd generation e-learning 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.

Chris Anderson has shown that web-based e-commerce differs from traditional commerce. In the world of physical retailing, and particularly in areas of selling goods (e.g., books, CDs, etc.), sales are usually dominated by best-sellers. Typically, 20 percent of titles generate 80 percent of all sales, which means that most revenue comes from the “fat” part of the tail and that most of the costs of operation come from maintaining the inventory in the “long” part of the tail (Manni, E. & Ilola, H., 2008).

In formal, informal and non-formal learning the situation is similar. As more learning becomes web-based, a similar pattern seems to be occurring. Whereas traditional schools offer a finite number of courses of study, the “catalog” of subjects that can be learned on-line is almost unlimited. There are already several thousand sets of course materials and modules on-line, and more are being added regularly. Furthermore, for any topic that a student is enthusiastic about, there is likely to be an on-line community of practice of others who share that information.

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.

3. Project aims and objectives

The specific aims of the project are:

(1) To develop a methodology for assessing the institutional requirements for development of Masters Level VET qualifications;

(2) To adapt Atwell's common framework for VET professionalization to address these institutional requirements;

(3) To develop parallel Masters Level VET qualifications in each of the partner institutions in order to support lifelong learning and professionalization in the sector;

(4) To utilize Web 2.0 technologies to facilitate these developments;

(5) To use collaborative tools in common modules;

(6) To create staff development programs 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 (Calderhead, J., 1997; Atwell, R., 1999) 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.

4. 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 (Education of Professionals in Vocational Education and Training) 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 (Atwell, R., 1999).

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 (Atwell, R., 1999).

Students trained 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.

5. Results of the project

5.1 Development of common modules

The specifications for module were prepared. “Multimedia and e-learning: E-learning methods and tools” was offered for students of initial vocational teacher training (see Figure 1). Most 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 MOTIVATE (Masters Level Opportunities and Technological Innovation in Vocational Teacher Education) area of Tampere polytechnic (http:// www.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.

5.1.1 Aims and assessments

The aim of the course is to introduce the learners different methods and tools used for e-learning. The learners find out what can be done with different tools, how they have developed and what the future trends in e-learning tools might include. The learners are not given ready answers but 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:

(1) Factors influencing learning (e.g., previous educational experience, motivation and learning style);

(2) Theories and models of teaching and learning (e.g., adult learning models, experimental and reflective models, cognitive theories, learning styles and motivational theories);

(3) Basic forms of collaborative learning;

(4) Role of communication and language in teaching and learning;

(5) Barriers to learning;

(6) Opportunities for professional development for specialist teachers and trainers;

(7) Organizations and networks, community-links and the role of teamwork. (Smith, M. K., 1999)

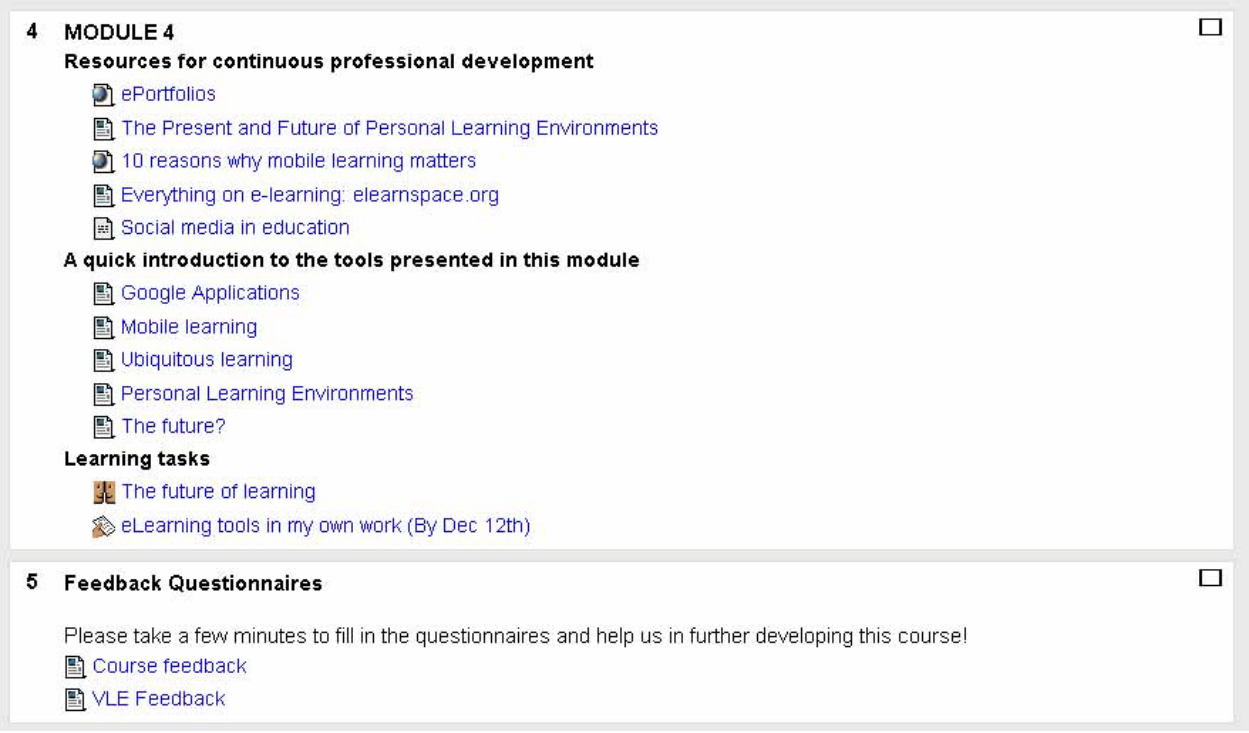

Figure 1 Structure of "multimedia and e-learning: E-learning methods and tools" module (a detail)

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

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):

(1) 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;

(2) Consideration of VLE usage for collaborative learning;

(3) Evaluations of the design and delivery of teaching and learning;

(4) Consideration of fundamental issues and principles relating to teaching and learning within the specialist

area;

(5) Evidence of reflection on teaching and learning processes.

Table 1 Learning outcomes of would-be-teachers

Learning outcomes	
Knowledge and understanding	
1	Critically understanding the possible transformations to teaching and learning brought about by the use of ICT.
2	Demonstrating an in-depth knowledge of techniques and strategies for researching the use of multimedia in teaching and learning.
Abilities	
1	Applying multimedia and interactive content for use within teaching and learning with originality.
2	Selecting 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	Researching innovations in teaching and learning using an methodologies derived from action research approaches.
4	Evaluating critically a range of technology based approaches to teaching and learning.

During the teaching and learning process all students have to prepare a project work as well, in which the learners analyze 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 is as follows:

Firstly, the mini projects will demonstrate (1) integration of a range of ICT tools and techniques creatively into current teaching practice; (2) evaluation of the use of ICT to support teaching and learning and make sound judgements about its use; and (3) synthesis of theoretical ideas and current debates around teaching and learning using ICT.

Secondly, the essay will demonstrate (1) the use of an ICT technique creatively, making sound judgements about its educational effectiveness; (2) synthesis of current practices and debates about the role of ICT; and (3) critical understanding of theoretical perspectives on use of ICT to enhance teaching and learning.

5.1.2 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 Moodle system to reach the above mentioned goals.

The course is divided in four modules (see 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	Flicker YouTube Second life Delicious Facebook/Myspace/Ning Voice thread for narratives	Narratives in teaching and learning	Exploration of Flicker/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		

5.2 Formation of communicative on-line learning community

In this point, on-line 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 with 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 (see Figure 2).

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

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, and 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, and 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:

(1) The flexibility of participation in learning at any time, in any place;

(2) 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;

(3) Discussions/contributions are recorded, which enables students and tutors to return to review activities or access answers to queries by others;

(4) 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.

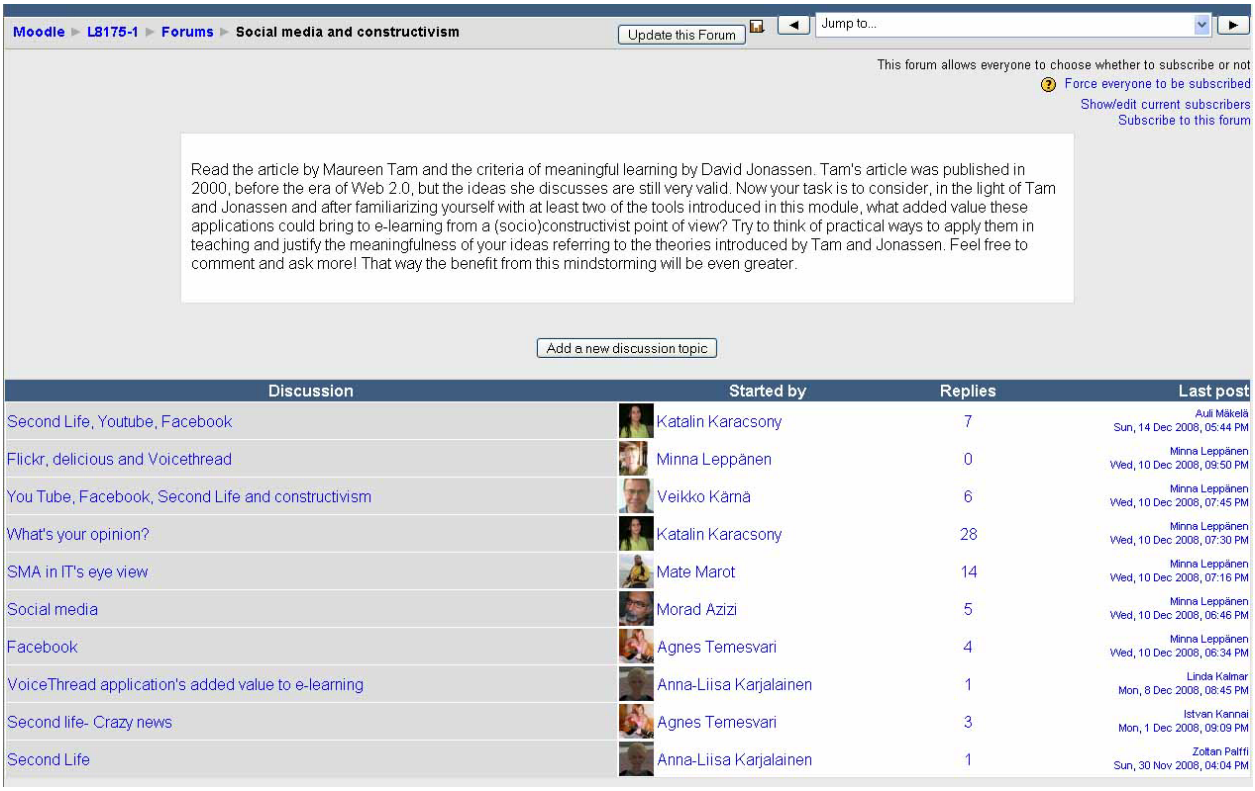

Figure 2 Forum threads in "multimedia and e-learning: E-learning methods and tools" module (a detail)

Let us see some students' opinions about the on-line community and learning by virtual course:

(1) Positive effects of using a VLE:

> It can be used everywhere (work, home, school, etc). It has even less barriers than the classroom type education.
>
> I have a freedom with timetables, interesting presentations (for instance trough YouTube) and collaborative learning with groups.
>
> No need to use pens. I love to use my laptop for learning. Forum helps me a lot to write my thesis about Web 2.0 applications in education.
>
> The best of all is better time management. I have always been struggled by strict time appointments. Some new tools (e.g., chat, forum) can be used.
>
> Made the international connection and learning possible when you have time, instant testing of links provided by others. I think it's essential to get personal experience on different virtual courses before you can plan your own.

(2) Values of learning together with foreign students:

> It was very interesting to compare with other students' different opinions and experience and to know some different cultures and habits.
>
> I hope some people realized that English is more important than they thought before, so I hope they start to learn it

again. And I think all of us will be a great teacher and have great success by using the right way of these Web 2.0 applications in education.

Learning together with foreign students made studying more interesting and pleasure.

New friendships can be made. It allows us to discuss the curriculum from different points of view in an international context.

(3) Influence of learning in a VLE in students' own studies:

Extra item was added to my everyday routine. I received some positive ideas about using it as a learner and a teacher. I have decided to plan my own course in VLE.

I would help learning in the secondary school as well where I teach, but the school leaders don't find it is a good method to be used at that age. I am thinking about using VLE in some other way.

I started to use YouTube, Delicious and Flicker for private use and also for teaching and research after testing during this course; another course gave me motivation to use Facebook. I'm going to test Google documents soon. So I got new tools and ideas for own web courses.

(4) Suggestions for the ratio of classroom and VLE learning in different courses:

It depends on the subjects of the course. On average, I think about 20-40% VLE and the rest is classroom learning.

I would suggest 50-50 percent in most cases. The presence of a teacher can help much, but VLE has also a lot of added value.

I find that many courses can be moved on to VLE, but I know, too, that some subjects demand also face to face learning. You only have to find the balance.

The basic elements of pedagogical dialogue include issues such as active involvement, attendance and commitment (Manni, E. & Ilola, H., 2008). It means that students are ready to continue discussion even when the topic or situation is not convenient for them, and they care for others and respect them. In dialogue, it is important that everyone can participate and the roles (e.g., teacher, student and visitor) are not crucial. What is crucial is that every opinion is as valuable. Dialogue cannot succeed without following dialogical attitudes: (1) active participation; (2) commitment to conversation; (3) reciprocal reaction and communication; (4) open and sincere expression; (5) respecting attitude; and (6) conversation and listening without me-centricity.

On the score of our experiences, we can determine skills which are fundamental in efficient on-line dialogue or on-line communication: (1) expressing oneself fluently; (2) receiving and understanding the real meaning of the given message; (3) bounding the messages; (4) concentrated continuing and improving on others' thoughts; (5) making enquiries for better understanding; and (6) positive wondering.

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".

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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