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Conference Proceedings

VIRTUAL ELECTRONIC LEARNING IN VOCATIONAL INITIAL TEACHER TRAINING

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A Brief Review of VELVITT

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 summarised 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 programmes has proved that these programmes cannot replace teachers and discussions are irreplaceable.

These shortcomings can be overcome if learning is organised 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.

Recognising 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: velvitt.banki.hu. The project is co-ordinated by Bánki Donát Faculty of Budapest Polytechnic and the consortium is formed by experts from Finland, Greece, Holland, Hungary, Portugal and the UK.

Project aims

The specific aims of the 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 programmes to support the management and use of virtual and networked learning;

- to increase trans-national collaboration in vocational ITT and develop capacity to deliver programmes where this takes place;
- to investigate the specific application of VLEs in vocational ITT, and to revise curricula to maximise benefits to teaching and learning processes;
- to compile and analyse data comparing various VLEs, and to disseminate this with a view to standardising policy in vocational ITT.

Work packages

Work package 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 website 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.

Work package 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 (Product 1) 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 programmes. The report of the audit (Product 2) is made public on the project website.

The staff development at the participating vocational teacher training institutions has been organised 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 programme for staff development (Product 3) was designed.

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

The content of staff development (Product 4) 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 centres.

These experiences and further research on extended data of staff needs supported a deep analysis of staff development needs (Product 5).

Work package 3 - *Curriculum development – Vocational ITT via VLEs*

This package has also been completed. The work includes:

- Harmonising ITT 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 (Product 6)

This work was rather complex because of the differing institutional requirements of the partners and the need to provide documentation which allows for harmonised delivery but which also meets local rules and requirements. The UK partners had a leading role in this process.

Work package 4 - *Course implementation – Common module delivery*

The activities of this work package included: organising 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 analysed.

Work package 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 (Product 7). In addition material from this work package will feed into the synoptic electronic learning strategy (Product 8) 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 harmonisation.

Products (Results and dissemination)

Product 1 - *Participant evaluation and report*

An overview was presented by each participant of the local virtual learning environment situation at the 1st project meeting in Huddersfield.

Initial national/institutional reports of virtual learning environment (VLE) usage presented in a commonly agreed structure were discussed and disseminated at the 2nd project meeting in Tampere.

Product 2 - *Audit of staff skills*

The audit of staff skills was based on a questionnaire designed for staff members of the participating institutions. The results of the audit were presented in the 2003 SITE (Society for Information Technology and Teacher Education) Conference by Matthew Pearson and David Lord. The title of their paper was: The Use of Virtual Learning Environments and Multimedia in Vocational Initial Teacher Education. The conference was held in Albuquerque, New Mexico, USA.

Product 3 - *Training programme for the use of VLEs*

Conference presentations were prepared about the topic of Training programme for the use of VLEs.

Á. Tóth - P. Pentelényi: WCCEE (World Conference of Continuing Engineering Education, Tokyo). The title of their paper was: Virtual Electronic Learning in Continuing Technical Teacher Training.

P. Pentelényi - P. Tóth – Á. Tóth: First Central European International Multimedia and Virtual Reality Conference, Veszprém. The title of their paper was: Preparing for Being Ready to Make Good Use of VLE Possibilities.

An article about VLEs in staff development was also published in a Hungarian vocational training periodical by Tóth Béláné and Pentelényi Pál.

Product 4 - *Paper based and electronic training material*

Paper based and electronic training material is being disseminated by each participating institution. The institutions send the CD-ROM and/or the paper based version of the product to initial vocational teacher training institutions of their respective country. The materials were also sent to the management of vocational schools acting as practical places for teacher training students.

Product 5 - *Analysis of staff development needs*

The audit of staff needs (Product 2) was presented by Matthew Pearson at the VELVITT Seminar of the 3rd project meeting in Budapest. Utilising the remarks and feedback of the seminar the analysis was extended and placed in the finalised form to the project website.

Product 6 - *Common module delivery*

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.

Specifications of the modules will be sent to initial vocational teacher training institutions on CD-ROM.

Product 7 - *Technical papers on VLE choice with recommendations on EU level harmonisation*

The Dutch team designed questionnaires for VLE users and research data were gathered and evaluated with the assistance of other partners. A study will be prepared in the final phase of the project.

Suggestions will be shown on the project website.

Product 8 - *Electronic learning strategy*

This product is also on its way under the umbrella of the research team of Dunaújváros College and the New University of Lisbon. Learning profiles and strategies are being examined in virtual learning environments.

Electronic learning strategies will be disseminated on the project website and also on CD-ROM so that the study could be utilised in vocational training and teacher training institutions.

Product 9 - *Publication of training materials*

Publication of training materials is being considered. This paper based material (textbook) could include the training materials on VLEs (Product 4) and methodological issues (Product 7 and 8). These materials could be used for staff development and also for teacher training purposes.

In addition to the listed forms of dissemination our videoconferencing itself is a good opportunity for receiving feedback from a wider user community.

Future plans

One of the main benefits of VLE usage is the capability of the system to support European collaboration of students.

Discussion boards of virtual learning environments provide the opportunity for large scale interactivity: question, answer, remark, argument, feed-back, confirmation may appear in various combinations of tutor-student, student-student, and tutor-tutor co-operation with increased varieties according to the number of tutors and students.

It was a new and interesting experience for us how these interactions could be moderated; tactics of initialisation, motivation and route correction were examined and tried.

Observation of students' learning achievements proves the value of these interactions.

Nevertheless in virtual learning environments there are further opportunities which could be utilised: such as the combined use of e-learning materials and VLE facilities.

Although we did not plan to extend our project activities to designing any e-learning material, there is a strong temptation to gain experience with the use of an e-learning material in a VLE.

In the future (either in the final phase of the project or in a further co-operation following the project period) we would like to prepare an e-learning material on Educational Technology which is a subject area generally taught in vocational teacher training. This module could serve not only as a training content to be learnt, but also as a resource for producing student collaboration. The assignment for the module could be an optional application of educational technology. The topic of the assignment could be: "Advices for our pupils how to use Internet for fulfilling a school task". The work could be based on pair-work on the condition that the two students are from two countries.

Due to the nature of teaching activities vocational teacher training has got an exceptional multiplying effect as regards the dissemination of teaching and learning methods. Using up-to-date ICT and VLE methods in vocational teacher training will result in immediate changes of applied teaching methods in vocational schools. Therefore the learners of vocational schools will be able to utilise the new learning methods and strategies. Moreover, these learners as young employees will very soon pass on their knowledge and skills for their working environment

which provides a further multiplying effect when organising special training courses for their workforce.

Conclusions

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 C. Padfield said in the Budapest meeting of the Working Group on Continuing Engineering Education.

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

The European collaboration provides an excellent opportunity to analyse research data gathered on the use of different virtual learning environments. Investigating the possibilities of virtual learning environment operation across different platforms contributes to making recommendations for future EU harmonisation 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.

Additionally there is a great potential to use networked learning environments to enhance pan-European dialogue in vocational teacher retraining and add an international perspective to national programmes.

Vocational teacher training institutions may have a driving role in the expansion of using virtual learning environments in higher education as well.

Resources

Henno J., P. Routsala: 1995, Computers and multimedia in lifelong learning, WCCEE conference, CD

Padfield, C., W. Schaufelberger: 1998, Lifelong learning in engineering education: a call to action, SEFI document No. 20.

Tóth, Á.: 1998, Staff Development Strategy for Technical Teacher Training Staff. in.: The Knowledge, Revolution, the Impact of Technology on Learning. 7th World Conference on Continuing Engineering Education, Torino.

Pentelényi, P. – Tóth, P.: 2002, New Equipment and Methods in Technical Teacher Training, Engineer of the 21st century IGIP Conference Saint Petersburg.

Matthew Pearson, David Lord

Huddersfield University

Experiences of Common Module Delivery Using Blackboard

Abstract

This paper examines issues arising from the delivery of modules of the vocational initial teacher training curriculum in the UK, Finland, Portugal and Hungary. The modules were developed as part of the Virtual Electronic Learning in Vocational Initial Teacher Training (VELVITT) project which is exploring how Virtual Learning Environments can be used to support vocational teacher training and in particular international collaboration in curriculum reform and development of teaching methods using electronic methods. Key theoretical ideas about collaborative learning and communities of practice are explored in relation to vocational teacher training and computer mediated learning. The paper describes the three modules which were developed and then evaluates the success, from both pedagogic and technological viewpoints, of the module delivery using the Blackboard Virtual Learning Platform. The paper then moves to a summary of findings about Blackboard as a tool for collaborative learning in vocational teacher training and draws some conclusions about the future for this work.

Introduction

The VELVITT project is examining the potential use of Virtual Learning Environments (VLEs) as tools to enhance and extend the delivery of teacher training in vocational subjects. A particular focus of the project is an exploration of the degree to which various VLEs can be used as the tools for international collaboration in the reform of teacher training curricula and to introduce trainee teachers to electronic learning methods. At the heart of the project is the key concept of the multiplier effect, which describes the way in which methods taught to trainee teachers are likely to be adopted by them once they move into practice, and therefore innovations in teaching and learning practice can be spread quickly and efficiently at national level. Operating also is the way in which new technologies, particularly those which provide a mediational and communicative route between participants can work to break down traditional teaching methods and lead to the emergence of innovative forms of participatory learning (Davies and Shukry Hassan 2002).

A key concept used frequently in modern analyses of teaching and learning using mediational means is the notion of legitimate peripheral participation, put forward initially by Lave and Wenger (1991) and then developed by Wenger into Communities of Practice (CoP) (Wenger 1998) where learning is organised not according to the conventional configurations of the classroom with the inevitable uneven power relationships between teacher and student, but rather in social groupings where a joint sense of enterprise and common purpose creates a new type of learning community based on communication and shared understandings. Gray (2001) has written of the need for the reflective learning cycle to be incorporated with learning in web based environments, and argues that a combination of virtual technology and reflective learning can be of great benefit. VELVITT has been using VLEs in this specific way, and the project design has sought to evoke the power of distributed discussions amongst a variety of participants with differing perspectives on teaching and learning (Makitalo and others 2002, King 2002). So learning in VLEs as conceived in the common module delivery is not simply a matter of content,

although content and curriculum materials were developed, tested, delivered and refined. Learning is rather a complex activity undertaken by trainee teachers through the variety of electronic means that VLEs have to offer and with clear links to the arguments made by Avis, Bathmaker and Parsons (2002) about the use of pedagogic knowledge and communities of practice within the further education sector in the UK.

An important part of the project plan involved the development of three common modules which were integrated into the curricula of the participating institutions. These modules were described as "common" because they would be taken by a selected sample of students in the UK, Hungary, Finland and Portugal. The modules were developed by the VELVITT project team in 2004 and were made live initially in the Blackboard VLE hosted by the University of Huddersfield (UK). The purposes of the common module delivery are twofold. Firstly the curriculum content of the three modules was being trialled in order to ascertain how far it supported the learning needs of the various national groups of students. Secondly the method of delivery using the Blackboard environment was being evaluated to determine the effectiveness of this particular product as a tool for international collaboration in common module delivery. This paper reports on two iterations of the common module delivery, the first taking place between January and June of 2005, and the second beginning in September of 2005 and ongoing at the time of the writing of this paper. The term "module" was used as it is currently the terminology used for a discretely taught and examined unit of learning at The University of Huddersfield. The exact interpretation of the word did vary according to the institutions, with some choosing to refer to is as a "course" or "unit". Each module was worth 20 credits at Foundation Level using the current UK tariff for describing learning in HE. As part of the project's commitment to furthering the Bologna process of increased integration and harmonisation in EU Higher Education Institutions, the project team decided that each country should integrate the process of awarding credit into their existing schemas and procedures.

Description of the common modules

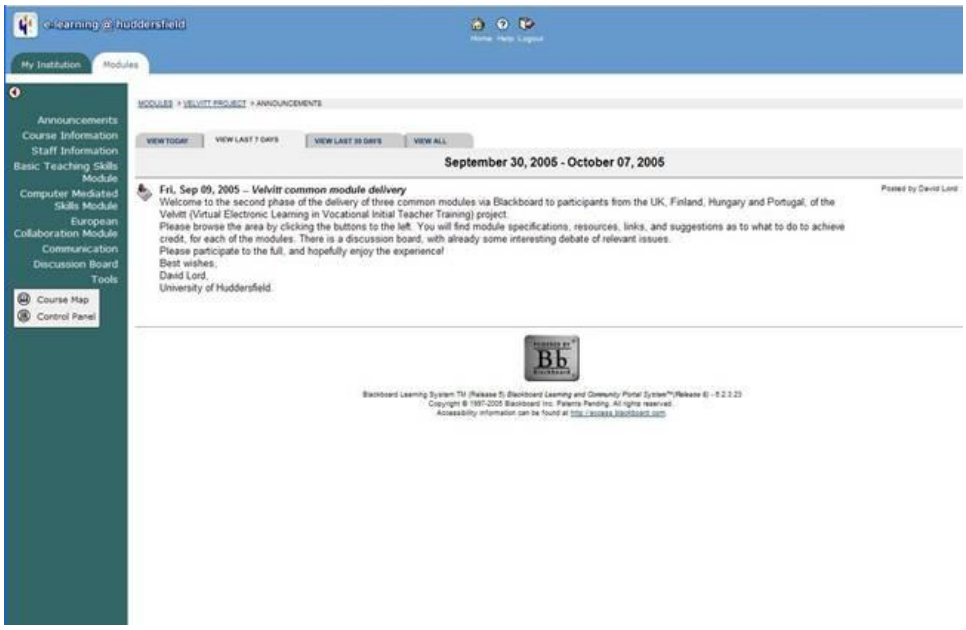
The three common modules are: basic teaching skills; computer mediated skills and European Collaboration. The content of each was chosen to compliment the existing curricula of each of the participating institutions and ensure that the content could be integrated into existing teaching and learning timetables.

The basic teaching skills module is the first of the modules and covers core concepts and ideas in the area of teaching as an applied practice. The emphasis is on helping participants to gain an overview of the necessary pedagogic skills needed for effective work in vocational education and to spend some time developing appropriate theoretical frameworks to describe their practice. The second module, computer mediated skills, focuses on the skills needed in using digital and electronic learning methods to support learning. These skills encompass the use of Virtual Learning Environments, but refer also to a wider sphere of technologies and activities including the use of Weblogs and Wikis for teaching and learning purposes and teaching skills in facilitating learning using the internet and online tools. The final module, European Collaboration, was explicitly focused on exploring issues of collaboration in vocational education within EU member states. The module encouraged participants to explore the policy backgrounds to EU processes of integration in vocational education and to take an active part in researching and evaluating similarities and differences in provision at national levels.

Assessment

Each of the modules was assessed through a "portfolio" approach. Participating students were guided to collect evidence, using a variety of methods and media, to show that they had met the learning outcomes of each of the modules. This method of assessment was flexible and provided the students with an open-ended set of possibilities for successful completion of the modules, rather than being a closed set of activities which would hamper creativity and autonomous learning. The development of independent learning strategies amongst trainee teachers is vital, and the modules modelled how responsibility for learning could be transferred to the student. The construction of a suitable portfolio of evidence for assessment was therefore a key requirement of the modules and our evaluation has determined that students were able to meet the learning outcomes for the modules in a variety of ways which suited their individual needs and learning dispositions. Students submitted their portfolios through email to their respective tutors. This use of email submissions was not new in all countries, but in many cases it was and the students and tutors benefited from trying a novel approach to submission which will probably supersede paper based submissions in the near future.

Teaching Methods



The exact nature of the teaching methods for the common modules varied according to national context, but in all cases face to face teaching was used to support the online delivery. The delivery could therefore be described as being a hybrid (Cray 2000) or blended (Whitelock and Jelfs 2003, Van Eijl, Pilot & de Voogd 2005). The modules were not designed to be studied solely as distance learning materials and without the support of the tutor. Instead the online material and activities compliments the activities of face to face teaching and provides students with a developmental context in which to gather evidence to assemble their portfolio submissions. The amount of time used in each country differed according to timetable constraints, but typically 3 to 4 teaching sessions of around one hour were used to orient students to the material, clarify assessment procedures and give them further guidance on completing the work.

Evaluation of the Blackboard Virtual Learning Environment

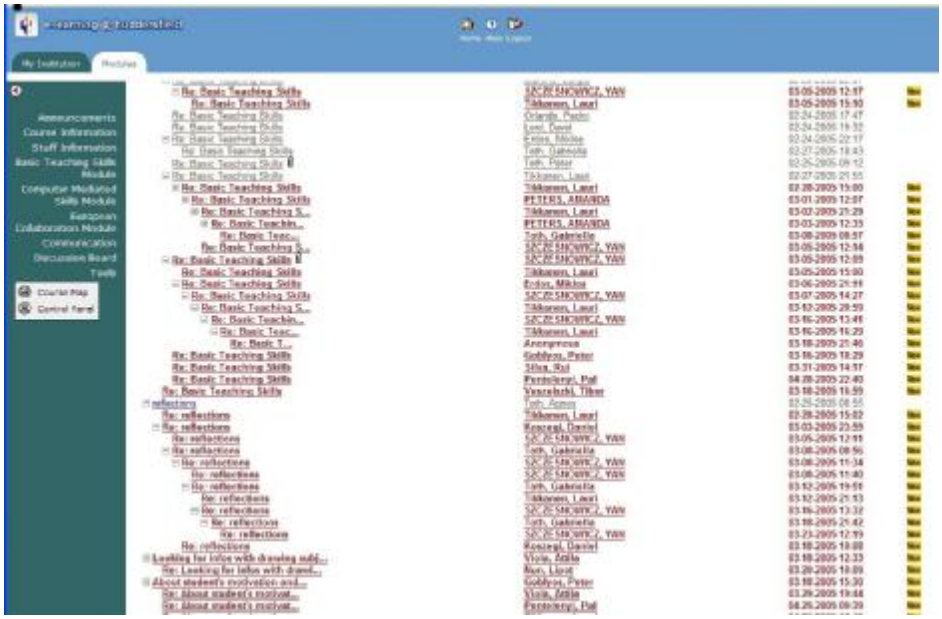
Blackboard is a well established VLE and has been in use at the University of Huddersfield for nearly 6 years. The university uses the enterpriser edition of the software which has database integration with the central student record database. AS part of the VELVITT project, the UK partners negotiated guest access for the students from Finland, Hungary and Portugal, although because Blackboard is a commercial product, there were cost implications here and funding was provided by the project. A username and password was created for each student and these details were then emailed to the tutors in each of the countries for distribution.

Blackboard is entirely web based for the end user. A standard web browser is used to access content and no plug-ins or additional downloads are required. Our evaluation showed that students from the participating countries had no difficulties in gaining access to the environment and the setting up of guest accounts did not present any operational difficulties. The Blackboard environment for the common module delivery was set up so that each of the modules appeared as a separate area within a shared space for the participants. The screenshot above shows the announcements section of the site, which is the first screen to display when a user enters the environment. An announcement by the UK coordinator is visible, as are the links to the three modules on the left hand side. On clicking the various module options on the left hand side, the user is taken to a space where the specific information for that module is available.

The following screen shot shows a content area (relating to the Computer Mediated Skills module). This area contains links to policy papers about e-learning, academic papers and links to other sites which students can explore. There are also PowerPoint presentations which could be loaded into the main window of the VLE, and a link to a subfolder on Weblogs (blogs), which contained multiple files on this issue. The content assembled in each of the module areas was similar in nature to this example and in each case this material was not intended to be an exhaustive and exclusive set of resources. Rather the material provided students with a useful set of links into the various topics and gave them ideas to explore further using online search techniques.

Online Discussion

A key feature of the common module delivery is the use of online discussion between students to allow them to explore ideas and exchange opinions. Blackboard has a forum tool which allows users to create online discussions which are threaded and which track the contributions of each user. The following screen shot shows the discussion threads for the basic teaching skills forum.



The discussions in each of the modules were lively and attracted participation from students across each of the countries. Exchanges between students from different countries were common and students used this space to compare and contrast their own situation with that of others. In many cases, the discussion board was used in order to socialise on a general level.

The following message was posted by a Finnish student and shows how the discussion forum was often used as a space where students could develop their thinking about the content of the modules. The characteristics of these communications was a strong personal sense of engagement with the content and the way in which the communication tool was used as a way for students to work out their thinking and explore important issues.

Forum: Teaching and learning issues

Times Read: 18 **Date:** 10-06-2005 19:34

Author: (name removed to protect identity of poster)

Subject Re: Teaching / studying in a virtual learning environment

Remove

Hello all. I just read your messages and I am sensing excitement out there. I myself have lost quite a bit of that over the 25 years I have been working with computers. These things come and go.

Someone mentioned the problems with skills. It might actually be good for virtual learning and teaching that people lack some computer using skills. This keeps developers busy and forces this new environment to evolve. If virtual learning does not earn respect among the users, it will be just one of those things. Well, the future may be something completly different than this.

Virtuality is nothing new for those with vivid imagination, like kids and other creative minds. It may even feel a bit flat world. Keep this in mind if you meet resistance.

I have been thinking of moving part of my teaching into this virtual environment. I teach construction techniques and the problem is how to use the reducing lesson hours effectively and not to stuff them too full of everything. It is also a resource problem. In construction things are too big to handle in a class room and there are too few concrete activities that we can use in teaching. We have to rely on practical training during the summer break. If I move all the basic reading parts of the teaching to virtual environment, it may become too dull.

I am not not worried about the hard-working students, they probably enjoy this virtual teaching world or at least do their work like in any other environments. But how to please those enjoying fully the busy student life and leaving studies aside? Teaching engineering must be very concrete and hands-on activity. In order to avoid too much text filled contents in virtual teaching we need interactive content and people capable of producing it. Something to get students going. We need new kind of teaching material producers and new tools to do it. Hopefully it won't lead to money problems.

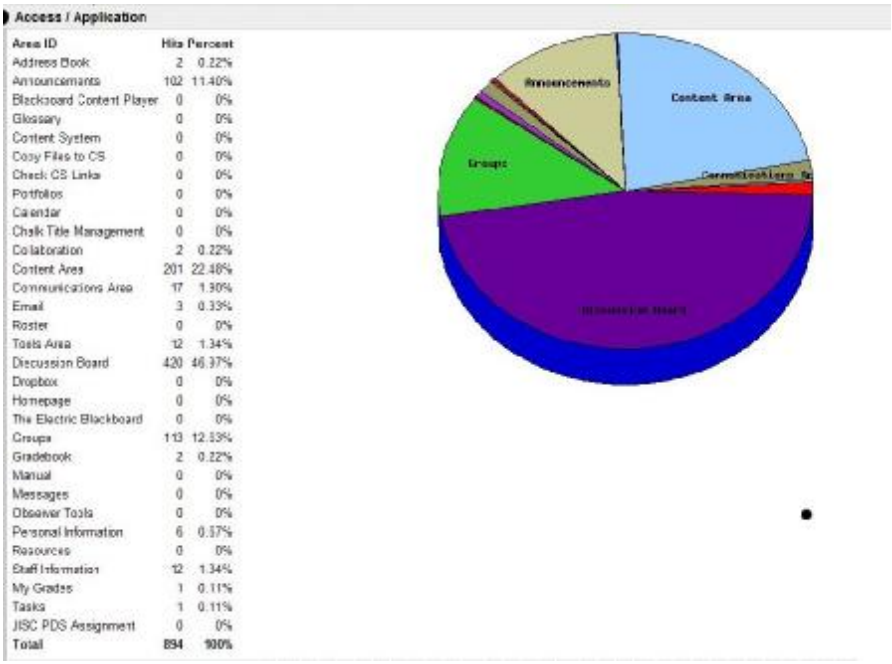
At the moment virtual teaching is still just a place to write to, a place for simple messaging. It is barely born, I think.

Administrator Tools in Blackboard

The following screenshot shows the "control panel" of Blackboard, where the administrator (tutor) can add and remove content, set up various levels of permissions for the users and gain access to the course wide statistics which are collected by the server running the software. Our evaluations of the usability of the control panel, conducted as email discussions within the participating tutors from the various countries showed that in general this interface was easy to use and did not require any significant extra training. A general familiarity with the operation of e-learning systems on the part of a new tutor was sufficient to allow them to master the administrator tools at the level of basic control over a course. Some issues concerning the specific terminology adopted by Blackboard did arise however and these, coupled with the lack of customisation of the interface, did concern the project team in relation to Blackboard's possible use as a Europe wide VLE.

Analysis of access statistics

The following figure shows the access statistics for the Blackboard area containing the three common modules. This output is available to administrators (tutors) using the system and produces statistics on the usage of the system based on page demands to the server running the Blackboard system. In addition to the raw hits, there is a column showing these hits as a percentage of the total and an automatically pie chart with appropriate shading to show which areas have been used most intensively.



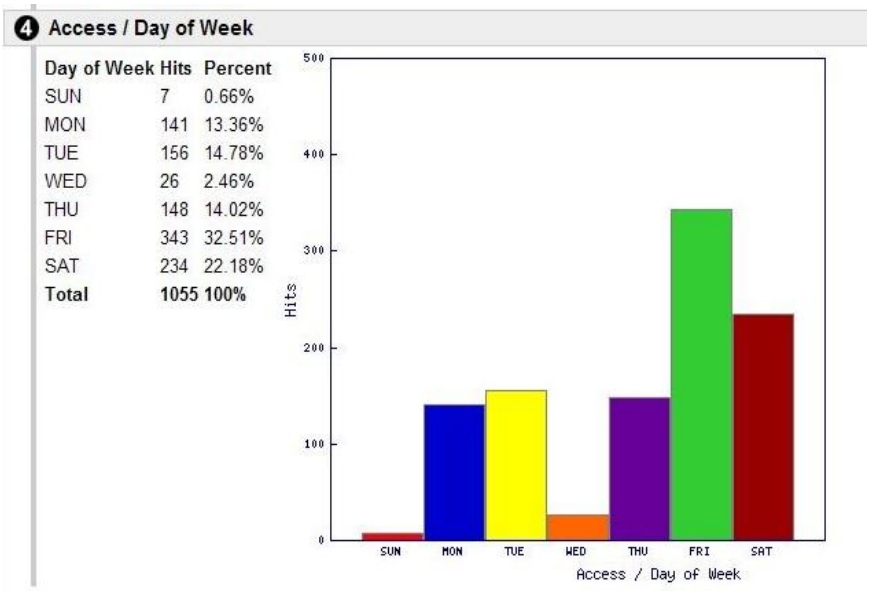
Access / Application

Area ID	Hits	Percent
Address Book	2	0.22%
Announcements	102	11.40%
Blackboard Content Player	0	0%
Glossary	0	0%
Content System	0	0%
Copy Files to CS	0	0%
Check CS Links	0	0%
Portfolios	0	0%
Calendar	0	0%
Chalk Title Management	0	0%
Collaboration	2	0.22%
Content Area	201	22.48%
Communications Area	17	1.90%
Email	3	0.33%
Roster	0	0%
Tools Area	12	1.34%
Discussion Board	420	46.97%
Dropbox	0	0%
Homepage	0	0%
The Electric Blackboard	0	0%
Groups	113	12.53%
Gradebook	2	0.22%
Manual	0	0%
Messages	0	0%
Observer Tools	0	0%
Personal Information	6	0.67%
Resources	0	0%
Staff Information	12	1.34%
My Grades	1	0.11%
Tasks	1	0.11%
JISC PDS Assignment	0	0%
Total	894	100%

It can clearly be seen that the most visited area was the discussion board, with 420 hits in total (46.97% of the total). This demonstrates the success of the discussion fora in supporting work on the module. The Finnish students were set a compulsory task to contribute to the discussions, but in other countries, participation was voluntary. The results clearly show that users visited the discussion board and made regular use of this facility. The next most popular area was the content area with 201 hits (22.48% of the total). This is not surprising as students would need to visit the content area in order to download material to support their learning. The announcement area was also visited regularly as was the "group" area which contained a list of participants for each country and was therefore used by the students to identify their fellow learners.

Access by day of the week

This shows the days of the week for access to the system. It clearly shows that Friday was the most popular day for accessing the system, a finding which is accounted for by the fact that two of the participating countries held face to face teaching sessions on this day of the week, leading to an increase in server activity. Perhaps a more surprising finding is that the next most popular day for access was on Saturdays. We know that no formal classes or teaching sessions were held on this day, so the inevitable conclusion is that students were using their own time at the weekends to work on the module and taking advantage of the flexibility of the system to study at their own pace and within their own timeframes. One Hungarian student posted this message to the discussion board "Hi, I wrote in my last/first letter, I had some trouble with my internet-connection. At the weekend, I tried to make up my leeway".



Learner evaluations of Blackboard

As part of the process of learning using the VLE, students participating in the common module delivery were encouraged by their tutors to assess the usability and affordances of the Blackboard VLE. Many of the submission for the computer mediated module included user evaluations of the system. In order that learners became acquainted with a variety of methods for evaluating systems, no pro forma for evaluation was issued and learners were encouraged to reflect and write using their own structures. Our findings are that most users, in common with the tutors, found Blackboard mostly user friendly and in terms of accessing content, transparent and usable. One significant finding was the dissatisfaction among many (over 30%) with the functionalities of the discussion board and forum tools. There was a sense that the discussion tools were not as intuitive as they could be, and that when compared with other web based communication systems (not necessarily VLE based), they lacked flexibility and sophistication. Typical comments were:

the discussion area of Blackboard feels a little clunky to use. The interface makes you follow a thread in a certain way, and there is a lot of mouse clicking to read the sections you want

I wasn't sure which discussion to join, or where it would all be happening

Given the focus on collaboration and communication within the common modules, this finding had potentially serious consequences, and as the project moved to its next phase, groups of students were moved into the Moodle learning environment and encouraged to compare their experiences of online discussions.

Conclusions

It is not possible in a paper of this length to cover the full evaluation of Blackboard as a tool for supporting pedagogy in vocational teacher training. However certain key themes have emerged and will be reported on in more detail in other project publications and outputs. We can

conclude that content management in Blackboard is well supported and is more than adequate at the moment for the needs of the participating institutions. The system itself is secure and reliable, and there were no periods of significant (measured as the system being offline for more than one hour) downtime during the testing period. Students were able to log on securely and the system coped well with multiple user sessions from around Europe. We found that customisation is not well supported in Blackboard. The system has a "corporate" feel and many of the features cannot be changed or adapted to meet end user needs. This need for customisation is more than simply modifying fonts, styles or colours, it extends to the particular terminologies used by Blackboard and the use of educational words from the US (such as roster rather than class list) which are not applicable in a European context. Although multiple language versions of Blackboard do exist, these can only be set at server level, so the installation at Huddersfield had to run in English. A facility for users to set languages on a per session basis would be an excellent addition to any VLE, but one which we have not yet found on any system. As mentioned above, the asynchronous discussion tools are limited and not universally praised by participants. Finally, we have to acknowledge that Blackboard has a high cost and adding additional users has implications for the host organisation. Licences are granted for the number of students at a host university and additional students from other countries incur additional licence fees. The fees themselves are a block to further integration and collaboration amongst European nations, and the additional administrative burden of setting procedures in place to cope with licensing issues may make further work which is not explicitly funded very difficult when using a system like Blackboard. The contrast with an open source environment such as Moodle is clear here, where user numbers are unlimited and there are no licence implications when collaborating across countries.

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Appendix One - Summary of 3 modules

Note that it is optional for students to complete their assignment in English. They may complete the work in their own language, although students writing entirely in English will maximise the possibilities for interaction between students in different countries. In some cases it may be possible for students to complete the work in their own language and then produce a short summary in English which can be shared with other participants.

Basic teaching skills Module

Module Synopsis

This 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

Assessment Plan

(Example products: note these can be adapted by each country according to local needs)

The student will produce a portfolio of evidence showing that they have achieved the module outcomes (3,000 – 4,000 words approximately). Typically the portfolio ***could*** contain the following elements:

- Plans for learning sessions and/or programmes of study are appropriate to particular teaching and learning situations, incorporating, where appropriate, IT and other key skills
- 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

Computer Mediated Skills Module

Module Synopsis

This module introduces students to a range of computer mediated options for retrieving information and for communicating and collaborating in educational settings. The module develops practical skills and provides opportunities for students to ally these to an understanding of the potential benefits of these systems for teaching and learning

Assessment Plan

(Example products: note these can be adapted by each country according to local needs)

Students will produce a portfolio of evidence to demonstrate their achievement of the learning outcomes. Typically this portfolio ***could*** include:

- Documentary evidence of use of a range of electronic methods of communication and information retrieval found in VLE systems
- A report on an electronic search (for instance CD-ROMs, Electronic Journal systems, WWW sites, discussion boards) for material relating to teaching area. This should include indicative material from the search and accompanying documentation concerning search strategy, key words etc
- A report containing reflection on the benefit of computer based technologies in teaching and learning and detailing how their use could be developed within professional practice

European Collaboration module

Module Synopsis

Explores European educational issues and the ways in which international collaboration can be developed amongst partner countries. There is a focus, through the use of online collaboration, on practitioners building up a network of contacts in Europe with professionals working in similar areas and an exploration of the funding and policy frameworks which could promote further cooperative work in the future

Assessment Plan

(Example products: note these can be adapted by each country according to local needs)

Students will produce a portfolio of evidence to demonstrate their achievement of the learning outcomes. Typically this portfolio ***could*** include:

- Notes in preparation for a bid to a European funding source for an educational project taking due account of current policies and guidelines, (500 words)
- Evidence of engagement with discussion and collaboration online (saved evidence from VLE usage etc), (1000 words)
- A short report comparing some aspects of educational provision in vocational education in EU countries, (500 words)

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The Finnish Way of eLearning Common Module Achievements and Experiences

Introduction

Two of the three common modules produced within the VELVITT project – Computer Mediated skills and European Collaboration – were agreed to be delivered through Moodle at Tampere Polytechnic. This article introduces our experiences concerning the delivery of the Computer Mediated Skills module. Principles that have influenced the design and implementation of the module are based on the national educational policy in using ICT in teaching and insight gained from earlier experiences in eLearning. In this article both of these backgrounds are discussed.

National background of eLearning

Using information and communication technology in different connections is very important in Finland nowadays. Electronic services have been developed and are developed for different purposes. The information society has progressed to a stage in which core services are increasingly offered in information networks. The situation in the near future will be that some parallel services disappear and certain services can be accessed only on technical devices. (1: p. 9.)

One objective of the Finnish Government Programme is to consolidate Finland's position as one of the leading information societies in the world. The government has chosen information society as the theme of one of its policy programmes. Extensive utilisation of ICT in different sectors of society is considered to enhance competitiveness and productivity, social and regional equality and citizens' well-being and quality of life. (2: p. 4, 8.)

The education and training system is in a very significant position in developing information society. The Ministry of Education has fostered the use of ICT in its sectors since 1995, when the first information strategy for education, training and research was published. The newest strategy, the third one, is for years 2004 - 2006. A solid education, good general knowledge and ICT skills acquired throughout life create the basis for using information society services. New technologies help to diversify learning methods and learning environments, back up and guide learning processes and simulate real work environments or processes in a virtual environment. Good knowledge and skills help people to use information networks and their contents appropriately. (2: p. 4, 13.)

According to the national development plan of education, Finnish know-how in educational technology must be raised to a high international level by means of pedagogical knowledge accrued in virtual teaching, in other development projects and in research. The use of ICT in teaching and learning should be further developed. Moreover, care must be taken that education provides sufficient knowledge and skills for assessing information content on the net and for managing information flows. Support is planned to be given to the development of virtual study entities of a high pedagogical and information technology standard, and teachers' initial and continuing education will be enhanced. (1: p. 17.)

A major challenge in the development of vocational education and training is to create learning environments for developing vocational skills needed in working life. The new technologies will be used to diversify teaching methods and learning environments, to support and guide learning processes and to simulate work environments. According to the development plan of education, every student in initial vocational training must have an opportunity to study part of the programme virtually. All the degree programmes of polytechnics must enable students to study at least 20 credits as virtual studies. (1: p. 40, 45.)

In the second information strategy for education and training, the training of teachers was in a very central position. For teachers the strategy meant a project called OPE.FI, i.e. studies in ICT, the framework of which all teachers were expected to participate in ICT studies. The levels of developing the ICT skills of teachers are(3: p. 17.):

- OPE.FI I: Basic knowledge and skills in using ICT – every teacher has to reach this level.
- OPE.FI II: The knowledge and skills to use ICT in teaching – half of the teaching staff has to reach this level.
- OPE.FI III: Special know-how – 10 % of teaching staff has to reach this level.

Until 2004 about 25 000 teachers had participated in the basic level ICT studies, 23 000 in the second level studies and 10 000 teachers in the third level studies funded by the government (4: p.15). The aim is that by 2007 at least 75 % of teachers have advanced to the second level, the knowledge and skills to use ICT in teaching (2: p. 14).

In teacher education, care is to be taken to provide teacher trainees with sufficient knowledge and skills for utilising ICT and electronic materials in education (2: p. 16). According to the development plan of education, in the development of teacher education, special attention will be paid, among other things, to the use of ICT in teaching. Also one of the education policy priorities in teachers' continuing education is the use of ICT in teaching. (1: p. 26 - 27.)

Different ways of using the Internet in teaching

It is important to bear in mind that there is no one right way of taking advantage of the Internet in teaching. The possibilities vary from using ICT to support classroom teaching to teaching completely online. In between these two ends there is a wide range of possible blended learning combinations; i.e. courses that consist of periods of online studying combined with face to face sessions. The decision to implement Computer Mediated Skills entirely online using a virtual learning environment as the platform where all activities take place was based on geographical facts. Face to face sessions would have been difficult to organize even for the Finnish participants living in different parts of Finland – no to mention the Hungarian and British students. The course was implemented in Moodle, an increasingly popular open-source virtual learning environment which has become the most widely used VLE at Tampere Polytechnic.

Different ways of conducting a web-based course

Teachers are often overwhelmed by the thought of creating a great deal of new learning material for a web course. This might be seen as a major obstacle to starting online teaching. Conducting an online course does not need to include massive material production. Using the web does not have to mean abandoning other, more traditional ways of teaching. For example, combining a web course with the use of a text book or other form of printed material is an option well worth considering. Internet resources can, of course, also be utilized – however, in this case the teacher is required to pay special attention to the reliability and topicality of the content.

There is a remarkable difference between the use of books and articles as material for independent studying and as study material for a web course. Whereas in independent studying the activities are limited to reading the text and perhaps taking notes, on a web course the information is processed with the help of different activities. These activities may be e.g. group work, discussions and assignments submitted to the teacher. Guidance, feedback, the feel of community and the presence of the teacher that are absent in an independent studying situation are all essential features of a web course.

The Computer Mediated Skills course is partly conducted in the aforementioned way – the students familiarize themselves with given articles and web resources which are then discussed in the learning environment. To keep the discussions to the topic all discussions are based on a set of questions formulated by the teacher. In addition to this there is a forum for open discussion where the students are given the opportunity to start discussions on any topic related to the course.

Why bother?

The use of Internet in teaching requires familiarizing oneself with new technologies and adopting a new way of pedagogical thinking. Moreover, one has to learn to see beyond the technical niceties and focus on the learning process. Especially in the beginning this might seem too time-consuming and stressful. One might easily ask what makes eLearning worth all the time and effort. It is important to see the advantages the web provides in order to find the genuine motivation.

First of all, one should keep in mind that eLearning is not a substitutive teaching method invented to supersede face to face contacts. Therefore the starting point should not be a desperate attempt to make online activities resemble classroom activities as closely as possible. On the contrary, the web should provide additional value to learning.

One of the most obvious advantages of the web is the freedom concerning time and place. Studying becomes possible for those who are not able to attend courses that require physical presence in a given place at a given time, either due to geographical restraints or unsuitable schedule. People from different parts of the country – or even different countries – are able to attend the same course as they do not need to travel anywhere in order to participate. Moreover, students who are at work, on a maternity/paternity leave or out of country as exchange students get more opportunities for furthering their studies. All they need is an Internet connection. It is a remarkable tool for distance learning as well, as it provides a convenient and efficient way of social networking for the learners.

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 teacher is there to answer questions and give advice. Moreover, one of the outstanding advantages of online teaching is the possibility to easily combine various multimedia elements in order to produce versatile exercises.

The teacher's role on a web-based course

A clear distinction needs to be made between using the Internet as a channel for distributing material and teaching an online course. As stated above, one of the clear strengths of an online course is the opportunity for adding the element of social networking to distance learning. This can not be achieved without the presence of a teacher.

The tasks of the teacher on a web-based course of course involve distribution of material, in one way or another. She or he can provide references, a link list, publish electronic articles on the VLE, ask the right questions that lead the student to search for answers or, in some cases, prepare her or his own web-based material. However, this is only a part of the teacher's role. Just as on a traditional face-to-face course, the teacher's tasks include giving direction and advice, evaluation and giving feedback. The online students – just as the classroom ones – need to be encouraged, motivated and informed on upcoming events. They too need answers to their questions.

The essence of the teacher's role does not thus differ from the teacher's role in face-to-face teaching. Only the tools for performing the tasks are new.

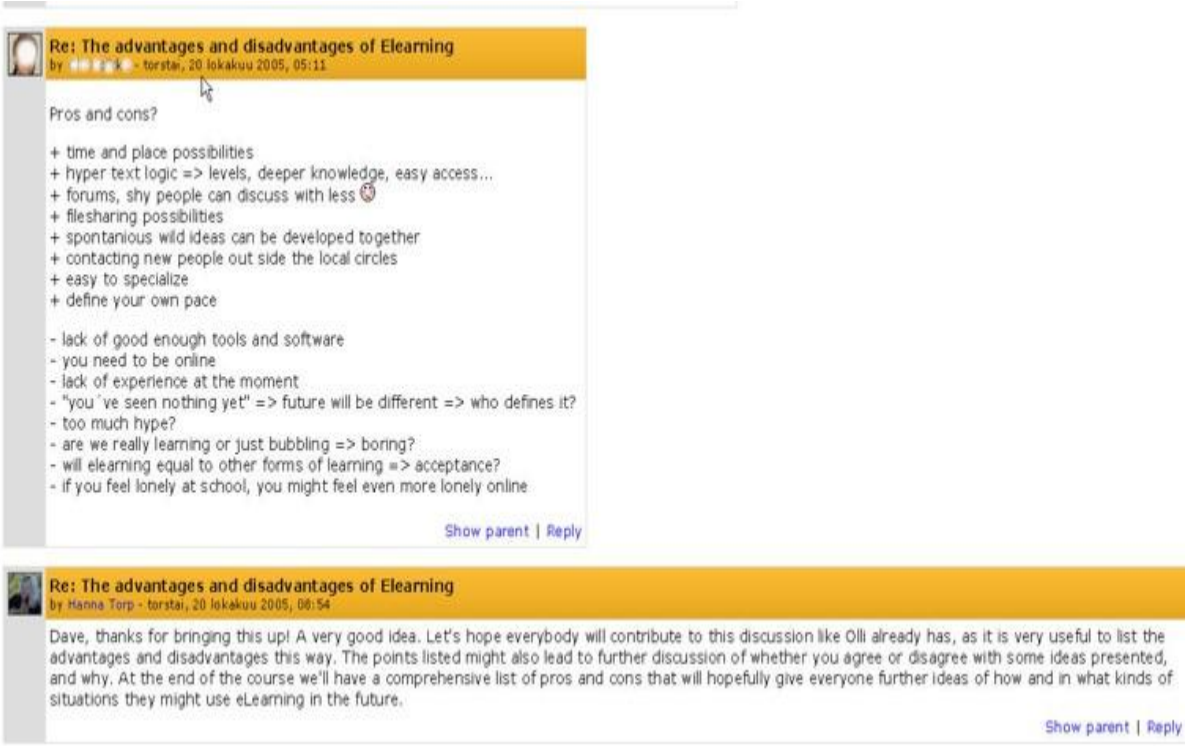

Figure 1. Teacher's participation in the discussion is a way of encouraging and giving feedback to students online.

Figure 2. The news forum provides a convenient way of informing students on upcoming events.

Preventing the worst-case scenario

Studying via the Web can be a lonely errand. At worst the student might get the feeling of having been left completely on their own in the virtual environment, surrounded by material and features with functions more or less unclear. There is no one to answer the questions, no one to support, no one to give any feedback, no contact to other students, the use of the VLE is difficult and scheduling creates problems. The task of the teacher is to prevent a situation like this from taking place.

The first discussion topic the Computer Mediated Skills students were given was to think of reasons that might hinder the use of web environments and online teaching. In the following quotations taken from students' replies to the question are accompanied with descriptions of the methods used in the Computer Mediated Skills course to avoid the worst-case scenario.

"One of the biggest obstacles for learners is technology. People feel they are not capable of learning the technology needed to participate in an eLearning course, when in reality most good eLearning courses actually require very little computer skills. If the instructions are clear, almost anybody with any experience with computers is able participate on an eLearning course".

The teacher of an online course will probably be thoroughly acquainted with the VLE in use, but there is the danger of failing to keep in mind that this is not necessarily the case with the students. There might be students who have not acquired even superficial experience with any VLE in advance. Things that appear self-evident for the teacher might cause enormous trouble for the student. This is why it is essential to begin the course with detailed practical instructions. Moreover, as there is no opportunity for face-to-face questions and answers, the instructions must be so easy to find that there is no chance whatsoever that anyone can fail to find them. In Computer Mediated Skills different ways of distributing information and giving instructions have been employed.

The course was started with a chat session, giving the students the chance to "meet" the teacher and each other. During the chat session the requirements and practices of the course were discussed and the students had the opportunity to ask questions. In addition to this, the very first text the students were bound to see on the front page of the course was an advisory text telling them to start by reading detailed instructions in the News forum. The link to the forum was placed right next to the text. This ensured that even the students who were unable to attend the

chat meeting had an easy and immediate access to the instructions. Moreover, the course implementation plan with detailed information about the course was published in the course area.

"Even when the reality of virtual learning is not overwhelmingly difficult, the thought of starting a course is stressful. Also the feeling of belonging to a group could be weak."

To enhance social networking and the feel of community the activities of the course were designed to require collaboration. The students communicate with each other in various ways. The course includes plenty of discussions and group activities. They are not there for the mere fancy effect with state-of-the-art technical gimmickry, but each task is relevant and tightly connected with the topics of the course. The aim of the tasks is to enhance exploratory learning and communication skills. The teacher also participates in the discussions by commenting, giving feedback, asking further questions and moderating the conversation. Moreover, the sense of community is improved by students' personal profiles – an area where the participants can publish their pictures and add some information about themselves. The pictures appear as thumbnail images in all discussion area contributions of the students, which gradually makes the faces more and more familiar to all participants.

Figure 3. An example of a student's personal profile. (Used with permission)

To facilitate the scheduling – which often appears to be a problem of independent studying – the deadlines for the activities of the course have been set so that the work cannot accumulate. All the activities were not published at the beginning of the course, but new tasks were given once the deadlines of the previous ones had been reached. Judging from a student's comment this has proved to be a good choice:

"The environment in this course is very clear and that's how it should be. There are only those parts needed, and nothing irrelevant. That's how students learn to use the eLearning environment and they don't get scared when they start to use it. It should be easy and comfortable to use."

Conclusion

Taking into account the crucial role of the educational use of ICT in the national level in Finland, the quality of online teaching must be given special attention.

It seems obvious that the importance of online mentoring and guidance cannot be emphasized too much. Online teaching is *teaching* after all, in contrast to merely publishing material on a website – which, of course, is a very useful practice when this is done in addition to other means of teaching. However, as such it cannot be regarded as a web course. If there are no resources for a web course that involves online teaching, organizing a web course stands on a shaky pedagogical basis. As a student on an online course once aptly pointed out, a web course without an online teacher is like an empty classroom with just a pile of handouts left on the desk for the students. On the other hand, once the pitfalls of online studying are taken into account in advance and a student centered approach is maintained during the design phase as well as in the implementation, the result can be something that enriches both learning and teaching processes.

Resources

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"Portuguese Experience with VLEs"

INTRODUCTION

Before discussing the topic itself, we shall come up with a brief profile of the sending institution, *FCT-UNL*.

FCT-UNL stands for *Faculty of Sciences and Technology of the New University of Lisbon*, which is a public higher education institution [HEI]. *FCT-UNL* was established in 1977 and has been located in Lisbon during the first 4 years. Later on (1981), moved to current location in Caparica, which is located 15 km to the South of Lisbon city centre.

FCT-UNL hosts nowadays approximately 6.500 undergraduate students and offers 19 degrees in Sciences and Engineering. 3 of those are Science Teaching degrees, although 2 of them have been suspended recently. The suspension is due to an insufficient number of students, who do not comply with the basic sustainability standards for the degrees to operate.

Only the degree in Applied Mathematics is fully operational for the time being, and thus its Educational branch of Maths Teaching. Likewise, the number of students involved is decreasing drastically along recent academic years, and so this degree is also struggling.

VLEs USAGE @ FCT-UNL

Portuguese Government launched in 1995 the National Information Society Initiative [NISI], whose focus for Education comprised the extensive use of ICTs to support learning activities of all teaching levels.

FCT-UNL has been involved in several innovative projects with an educational outcome since the mid-80s. The recommendations of central government (under the framework of NISI) have just reinforced those concerns and contributed to expand the initial plans outlined. Hence, the institutional strategy for ITs started to be implemented accordingly.

Nonetheless, the step forward to move from traditional instruction to more up-to-date methods of delivery, have not followed same pace as above, and for a long period the policy for distance education was yet to be coherently developed.

Apart from discrete / isolated initiatives in several sectors (e.g. domestic portals), no VLE has been adopted until the year 2004. After a short testing period, the academic year of 2004-05 marked the adoption of *Moodle* (www.moodle.org) by *FCT-UNL*.

Not all courses are currently using *Moodle*, although the management and teaching activities are expanding significantly, reaching in this new academic year (2005-06) approximately 10% of *FCT-UNL*'s universe (students, professors, researchers, etc.).

DOMESTIC WEB-BASED LEARNING ENVIRONMENT [dom-WBLE]

FCT-UNL's Educational Sciences Sector [ESS] proposed a pioneer initiative for the academic year of 1997-98, which comprised the introduction of a domestic (in-house) web-based learning environment, as a supporting tool to the traditional F2F classes.

This tool was in constant use until the end of 2003-04 academic year. Main objectives deriving from its implementation were as follows:

- Setting-up of an information repository (FAQs, courses' *syllabi*);
- Setting-up of a download area (shareware software);
- Structuring a area for students' portfolios (area of contents);
- Setting-up of an administration area (calendar, summaries, etc.);
- Setting-up of an evaluation area (detailed review and final marks).

Despite its domestic origin, the dom-WBLE did incorporate a reasonable set of features and characteristics, which can are summarised along the paragraphs below. The later contributed to boost learning outcomes and to set-up locally some proto-distance learning communities.

- Companion ftp server with restricted access;
- Course's own mailing list (*Yahoo groups*);
- Comprehensive list of educational software and other resources;
- Regular updates (FAQs, calendar, administration area, etc.);
- Support of external peers, whenever available (other tutors, software developers, etc.);
- Html editing compulsory for assignments' delivery;
- Reviewed profile: the word to the individual;
- Flexible templates available for further use.

Now that some years have passed already, the ESS generated a list of draft conclusions upon the dom-WBLE usage. Those were grouped in "pluses" and "minuses", for an easier understanding.

1 - PERCEIVED "PLUSES"

- Intense collaborative work (within the groups and the class);
- Development of social skills (communication…);
- Improved level of interactivity between peers;
- Substantial time savings for certain administration tasks (tutors);
- Easiness of use by students;
- Multiplicity of embedded tools;
- Threaded discussions are possible;
- Open source software (flexibility and availability);
- "Learning community" concept expanded.

2- PERCEIVED "MINUSES"

- Requires huge administration work by the tutor;
- Students' registration is not automated;
- Mailing list inefficient for sustaining a discussion;
- Too much flexibility with templates can be a burden for the tutor;
- Html editing and ftping might be complex for some students;
- Calendar features proved to be insufficient;
- Temptation to concentrate on aesthetics rather than contents;
- Some simple tasks are not automated: it requires extra time from students enrolled.

IMPLEMENTING Moodle

Another pioneering initiative of ESS' responsibility! As stated before within this document the initial experiments took place in academic year 2003-04. Full adoption on effect the following year, with the purpose of:

- Facilitating information exchange (FAQs, working documents, courses' *syllabi*);
- Setting-up an interactive communication area (embedded);
- Setting-up an administration area (embedded);
- Providing pool tests and self-assessment tools (embedded).

Only 2 years have gone by now since the implementation of *Moodle* at *FCT-UNL*. In any case, we could make already some kind of comparison between the two supporting methodologies. Key findings below, grouped again in "pluses" and "minuses". Additional data is compulsory, for a more consistent analysis.

1 - PERCEIVED "PLUSES"

- Intense collaborative work (within the groups and the class);
- Development of social skills (communication…);
- Improved level of interactivity between peers;
- Substantial time savings for administration tasks (tutors);
- Easiness of use by students;
- Multiplicity of embedded tools;
- Threaded discussions are possible;
- Open source software (flexibility and availability);
- "Learning community" concept expanded.

2- PERCEIVED "MINUSES"

- Portfolios are not developed in such a creative way;
- Too much interactivity (discussions, chat, etc.) might have risks;
- …

LOCAL PROJECT ACTIVITIES

Amongst the group of activities developed locally, we quote the common module delivery issue (Huddersfield's course) by a group of "PT-testers" (PT stands for Portugal). Group elements came up with an evaluation report which comprised the following topics:

- **VLE access:** difficulties, no. of trials;
- **Module contents:** categories, relevance, transferability to national context, overall structuring, portal design;
- **Additional comments**.

Individual reports were analysed at a later stage. The following set of key findings summarises the work done by the "PT-testers" group.

- **"Unknown" VLE:** Huddersfield uses *BlackBoard*. It didn't turn to be a major burden for students;
- **"Language issue":** considered to be a positive aspect, which promotes practice and improves proficiency;
- **Involvement of 4 countries:** contributed for a rich learning endeavour;
- **Compulsory:** learners' commitment to the learning process;
- **Tutoring and coaching:** should be permanent, in order to keep motivation standards high and reduce drop-off rates to a minimum;
- **Critical issue:** provide "instant" feedback to questions posed and activities accomplished by learners;
- **Structuring contents:** the way contents are organised play an important role for the success of learning.

AFTERWORD

Distance learning is gradually entering unknown territories. This is caused by the constant development of **i -** new software tools and **ii -** more complex course management systems [CMS]. The emergence of innovative instruction methodologies is also taking place. Thus, actors involved within the Educational phenomena have to be attentive to the **e**-challenges facing ahead.

The effectiveness of the learning process is by all means critical, in the edge of a 21st century where globalisation and competitiveness are just a few of its dimensions. Information and Communication Technologies play a fundamental role in this context: have to be supportive and inclusive, not exclusive nor obstructive.

This short contribution comes up with some remarks that we consider helpful for decision-makers. Those have to be properly assisted on their task of conceiving a suitable strategy for pursuing the educational outcomes identified by their home institutions. Some steps have been given already, but the way ahead is still long and unexplored!

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Hungarian experience with the common module delivery

Abstract

Within the project of Virtual Electronic Learning for Vocational Initial Teacher Training, students of teacher training from Hungary, Great Britain, Finland and Portugal jointly elaborated with the help of electronic communication two subject modules, namely Basic Teaching Skills and Computer Mediated Skills. Tutoring the students' work made it possible to explore important cognitive activities, to model the learning process in VLE, to examine the communicative efficiency of the electronic learning environment, to see the advantages and disadvantages of the application of discussion board and the criteria for its efficient application as well as the basic types of participation in electronic communication.

Introduction

Virtual Learning Environments (VLEs) are built on a foundation of two key elements: computer technology and education. The technology aspect of virtual learning environments provides facilities for learning management tools, online learning frameworks, collaborative learning environments, web course design tools, etc. The software typically resides on a server and is designed to manage or administer various aspects of learning; delivery of materials; student tracking; assessment and so on. [1]

VLEs are inevitably designed with a pedagogical model in mind that is not made explicit. The development of virtual learning environments is typically guided by the consideration of two key elements: Technology and Education as shown in Figure 1. ***Technology*** is made up of many sub-categories based on computing technology. ***Education*** is made up of many sub-categories based on educational models. [2]

Figure 1. ***The t***raditional framework for virtual learning environments

Focusing on supporting the learner and the learning environment, the traditional framework does not make explicit the importance of learning experience and the context in which learning occurs. *S. Clark and M. L. Maher* propose a framework for virtual learning environments which considers the learning experience and draws on design as in pedagogy, illustrated in Figure 2. [3]

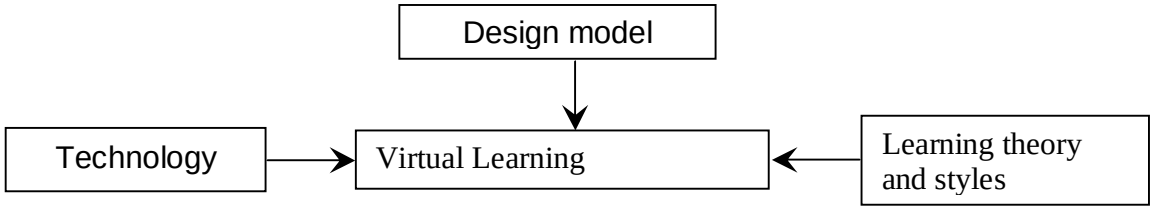

Figure 2. A framework for virtual learning environments which considers the importance of design

The development of this framework leads to a model for virtual learning that can benefit from architectural theories and principles of design teaching. Figure 2 illustrates the framework as having a third component, design models. Design models bring relevant design theories and pedagogy to the learning environment, focusing on the role of context and experience.

Where each of the components of the framework in Figure 2 can be elaborated to take into account numerous alternatives, we should mention a specific style of VLEs. This style of virtual learning environment supports the four key processes fundamental to a constructivist learning environment identified by ***D. H. Jonassen*** as context (meaningful and authentic), construction (of knowledge), collaboration and conversation (between student/student and teacher/facilitator/ mentor). [4] [5]

1. Cognitive activities in virtual learning environment

A, J. Romiszowski arranges the two basic forms of cognitive activities, that is the mode of learning and the form of communication, along two parameters in VLE. The former may be of an individual, social or group kind while the latter may be of an online, real-time and synchronous kind or of offline, non-real time and asynchronous kind. [6]

Combinations of these may manifest themselves in the most varied forms of electronic training: Web Based Learning, Computer Based Training, E-learning, and Virtual Learning Environment. [5]

In the case of Web Based Learning access to the syllabus is by the web browser either via intranet or extranet. Syllabus reachable this way often contains access to other such training resources as for example reference tasks, e-mail addresses, notice boards and discussion board.

Computer Based Training (e-Learning) is a form of electronic learning which aims at the acquisition of learner knowledge or qualifications. According to its form, the electronic syllabus may be of an optional storage-run and multimedia based kind and/or of a hypermedia based kind accessible via web server. [10]

VLE is a form of electronic learning which takes place in an integrated syllabus-transmitting, communicative and student-registry system. Frame systems (Blackboard, WebCT, Moodle) contain standardised elements (LMS, SCORM) and may be run on web servers.

These 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 and Computer Mediated Skills, we too realised 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 (realisation of course). Virtual classrooms use the services of the system to reach these goals.

Analysing students' work in the virtual classroom, we may distinguish the following cognitive activities:

- communication

A primary form of communication in VLE is linguistic and formal communication. The former is based on the comprehension of a written text, on the presentation of an idea of one's own and on arguing, whereas the latter is based on a written form of expression free of grammatical rules (table, formula). Different forms of visual communication such as for example chart reading and interpretation were typical to a lesser extent only, while chart formation was not at all typical.

The basic forms of electronic communication were the following:

~ chat for on-line textual communication particularly between student and tutor/mentor/facilitator and students mutually,

~ mailing list is used by all groups of the users,

~ discussion board for sharing and discussing individual thoughts with the whole group.

- knowledge acquisition (attainment)

In the course of knowledge acquisition new knowledge is acquired via recording new information or exploration. Generally, knowledge acquisition involves learning at the same time, but not necessarily. Information recorded in the working memory may be deleted, forgotten or may be objectified in some outer store, or fixed (in for example an electronic notebook) without learning taking place. Learning interpreted this way means the acquisition of knowledge where information acquired is permanently built into the human background memory. Two basic forms of knowledge acquisition may be distinguished: the acquisition of information and problem solving. In the course of acquiring information "ready knowledge" is available, so it is only confined to the voluntary search, selection, comprehension and recording of necessary information. Problem solving is a cognitive activity where there is no "ready knowledge" at disposal, but it needs to be explored.

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

~ the interpretation of learning as a process and a product,

~ the most important theories of learning: behaviourist, cognitivist, humanist, social and situational,

~ the relation of Gardner's multiple intelligence theory to education,

~ the interpretation of Kolb learning styles,

~ Bloom's taxonomy,

~ the process of lesson planning. [11]

The active application of "ready knowledge" as above was needed in problem situations in the course of which students had to prepare concrete lesson plans according to the following:

„Writing a lesson plan involves:

~ deciding on content and identifying appropriate aims and outcomes

~ specifying an appropriate sequence of topics and tasks

~ choosing teaching and learning strategies that will help the learners achieve the outcomes

~ describing how your learners will demonstrate what they have learned

Stages in a lesson

Read the following scenario and critically analyse the session it describes and use this experience in your planning.

Stages	Purpose	Methods
Introduction	to set lesson in context to link to previous work to share aims and outcomes	– domestic arrangements – ice breakers – presentation of aims and outcomes
Development	to present new learning	– demonstration chalk and talk discovery/research – brainstorm – discussion/debate – reading – case studies
Consolidation	to allow learner practice	– practical/field work – exercises – discussion/debate – role play – assignments – group work
Assessment	to measure learner attainment	– test/task/exam – observation – discussion – question and answer – quiz – tutorial
Summary	to provide link to next session/topic to set work	– learners list 3 things they have learned from lesson – revisit aims and outcomes
Evaluation	to observe reaction and progress	– brief discussion to obtain feedback – teacher reflection.”

After that, students of teacher training had to fill in the following table and thus prepare the plan for 8-10 lessons. These plans were then put in practise during the teaching practices at secondary comprehensive schools. Using the experience gained in teaching, students gave evaluations of their own lesson plans.

Topic:	Module:	Session no.:	
Tutor:	Date:	Time:	
Aim(s):			
Learning outcomes – by the end of the session the learners will be able to:	Learning activity (including opportunities for Key Skill development):	Assessment	Resources
Lesson evaluation:			

As the above examples also show, the preparation of lesson plans develops students' creativity. It is the very essence of creation that while it modifies students' existing knowledge, it also produces new knowledge (the planning and projection of all the cognitive activities necessary to give a certain lesson) and a new product, namely a lesson plan is created.

- thought

Both communication and knowledge acquisition are related to a third cognitive activity, namely thought. In other words, communication and knowledge acquisition in VLE demanded and so called forth students' thought activity as well. In this respect three kinds of activity can be distinguished:

~ the transformation of existing knowledge in the interest of acquiring new knowledge,

~ the recognition and arrangement of the relations between the elements of existing knowledge in the interest of acquiring new knowledge (comparison, identification, generalisation and classification),

~ knowledge acquisition based on logical conclusions

Naturally, the basic aim of the cognitive activities presented above is learning.

The maturity and efficiency of the learning ability primarily depends on the maturity and efficiency of the cognitive activities presented above as well as those of the cognitive abilities developing from them. That is to say, the ability of learning is best developed by the development of communicative, knowledge acquiring and thought abilities.

In VLE, where students mainly had to perform a self-directed and self-regulated learning activity, the efficiency of learning was determined by the maturity of the abilities of independent communication, knowledge acquisition and thought.

The learning process in VLE can be best described by the Peter Jarvis model (Fig 3).

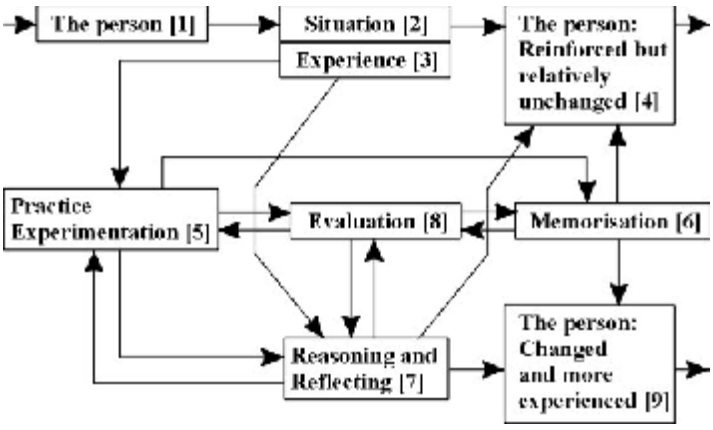

Figure 3. Experimental learning model by P. Jarvis [12]

He sets out to show that there are a number of responses to the potential learning situation. Jarvis used Kolb's model (quoted in [5] and in [10]) with a number of different adult groups and asked them to explore it based on their own experience of learning. Jarvis was then able to develop a model, which allowed different routes: non-learning, non-reflective learning, reflective learning (see below). To see these we need to trace out the trajectories in the figure he produced. [12]

a) Non-learning cognitive activities

– Presumption (1→2→3→4). This is where people interact through patterned behaviour.

– Non-consideration (1→2→3→4). Here the students do not respond to a potential learning situation.

b) Non-reflective learning

– Pre-conscious (1→2→3→6→4 or 9). This form occurs to learners as a result of having experiences in daily life of which they are unaware. Skimming across the surface.

– Practice (1→2→3→5→8→6→4 or 9). Traditionally this has been restricted to things like training for a manual occupation or acquiring particular physical skills. It may also refer to the acquisition of language itself.

– Memorisation (1→2→3→6[→8→6]→4 or 9).

c) Reflective learning

– Contemplation (1→2→3→7→8→6→9). Here the learners consider something and make an intellectual decision about it.

– Reflective practice (1→2→3[→5]→7→5→6→9). This is close to what Schön, D. [quoted in 11] described as reflection on and in action.

– Experiential learning (1→2→3→7→5→7→8→6→9). The way in which pragmatic knowledge may be acquired.

2. A model of communication based learning environment

In my present study I examined communicative activity in VLE in connection with the modules Basic Teaching Skills and Computer Mediated Skills. First I drew an outline of the

effects of a particular electronic learning environment and I gave an interpretation of the role of the teacher in regulating this system.

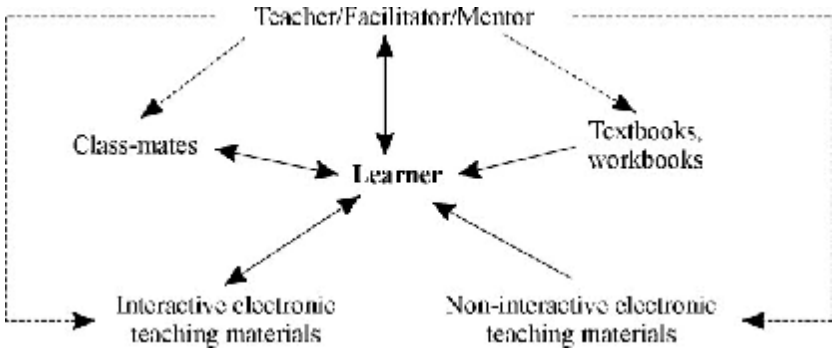

Figure 4 The communicative effects of the electronic learning environment [13]

The creation, preservation and development of the system of conditions of personality developing communication have immense significance in the organisation of the learning environment. In this model the role of the teacher/facilitator/mentor is, for the maximum efficiency of the learning process, to arrange into a system of developing effects the various personality forming and cognitive developing effects of different media, means and modes of communication.

The learner is in the focus of the system. Considering his cognitive activities (communication, knowledge acquisition) he is in one- and two-way relationships (solid line) with the basic sources of information acquisition. Interactive and non-interactive syllabuses are particularly new sources of information acquisition in electronic learning environments. The role of the teacher/facilitator/mentor is to organise the learning environment as well as to re-regulate and make precise the communicative system of effects (dotted line). The forum provided by VLE (discussion board) proved a useful means in this activity.

Blackboard offers the following communicative means and opportunities to teachers/facilitators/mentors and students:

Learning and communication forms	Virtual Learning Environment	
	Computer Based and Integrated Learning	Computer Aided Communication
Online learning / Real-time communication	Web based learning, Browsing on Internet	Electronic forum, Discussion board, IRC
Offline learning / Non-real time communication	Downloading or uploading files	E-mail

Table 1. Basic learning and communication forms in VLE

Besides the cognitive activity of electronic communication and knowledge acquisition, in the course of processing the modules Basic Teaching Skills and Computer Mediated Skills and 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 (4 times 2-2

classes per term), tutorial – between the student and the teacher/tutor, or between the student and a student, school teaching practice – between the student and the comprehensive school mentor (Table 2). 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.

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	------	Active participation in debate in discussion board Discussion about lesson planning
4	------	
5	------	
6	Discussion about connections between chosen teaching methods and learning styles	------
7	spring holiday	
8	------	Active participation in debate in discussion board Discussion about lesson planning
9	------	
10	Individual consultation about lesson planning	------
11	------	Active participation in debate in discussion board Discussion about lesson planning
12	Evaluation	------

Table 2. Achievement of the common module in Hungary – Blended learning

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

a.) Classroom-based training

lectures with explanation and interpretation,

seminars,

discussions,

group-work (e.g. analysing and comparing a given VLE system),

individual working with teacher leading/under teacher guidance (e.g. first steps in given module).

b.) Self-paced e-learning

participation in email and discussion board communication,

leading the debate,

uploading new reference.

The most important teacher instructions in the virtual teaching-learning process are the following:

Interpretation of blended learning,

Giving viewpoints for analysing VLEs in general and the given module,

Assistance in theme choice,

Analysing 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 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.

3. The discussion board as basic communication platform in VLEs

In this chapter online communications will be introduced by focusing on text-based computer communication, e.g. via discussion board. Discussion board is commonly provided in VLEs, such as Blackboard, WebCT 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 (Fig 5). Discussions are also recorded, enabling students and the tutor to return to them. The discussion board is a "virtual office", which shares individual student questions with the whole group.

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

Summarising these, discussion board allows students to:

- contact tutors on an individual basis,
- collaborate on and share tasks, including the exchange of files,
- provide each other with feedback,
- raise questions,

- participate in open discussion,
- share experiences, ideas and resources.

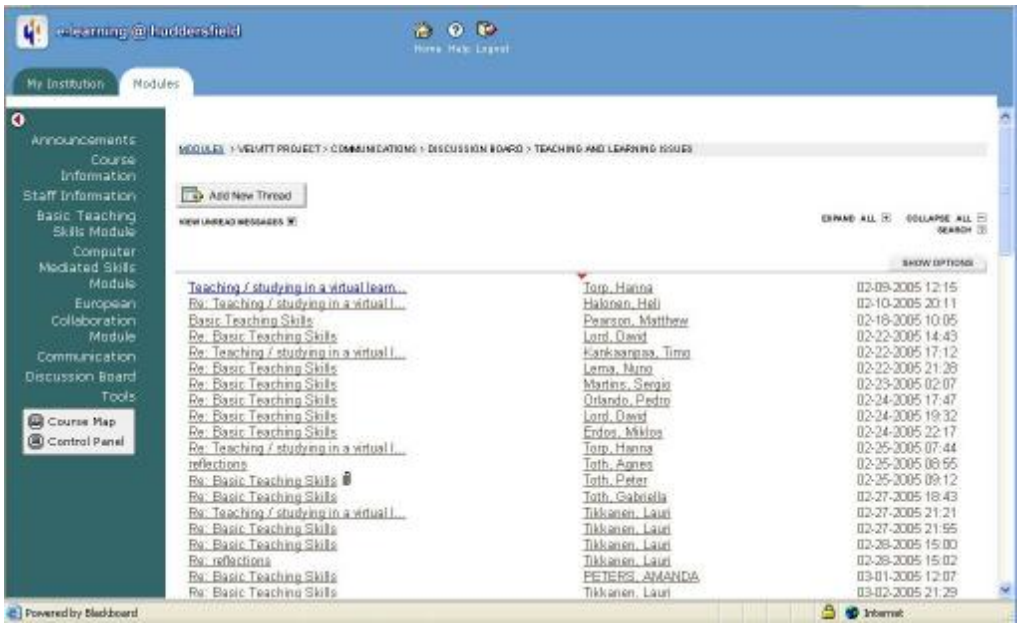

Figure 5. Example of a *d*iscussion board from Blackboard

It allows teachers to:

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

On the evidence of our experience the benefits of using discussion board in virtual learning 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.

4. Efficient learning and teaching by using discussion board

According to our experience in using the discussion board of VLE in the teaching-learning process it may 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 in face to face courses (blended learning).
- It is well-known that would-be-teachers have an increasingly higher level of IT skills and the ability of searching for available and appropriate information on the 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 addressed.
- 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 less 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.
- The students (now would-be-teachers) with different first languages may have communication problems 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 as well as to make sure we devote some time and support to encouraging a common use of language.
- The composition of the student group plays a very important role in electronic communication similarly to the face to face one. Many factors, such as the abilities of the group members or group size, define the efficiency of our common work. "Too large groups may lead to free-riding or 'lurking', and too small groups may suffer from the lack of different views or particularly in an online situation, a critical mass for a lively discussion." [7]
- The social dimension of learning is particularly important when considering online communities of blended learners. In this dimension of discussion board mentors need to recognise learners as creative and active producers, and to realise that learners control of the structure of their learning environment is important for both learning and effective socialisation. This is difficult to achieve in some discussion board systems, 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. [8]

5. Structured debates on discussion board

Structured debates using discussion boards can be a useful way to develop students' analytical and academic discussion skills. Each student can be assigned a role in the debate: (illustrated by examples of Basic Teaching Skills module)

- 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 and to keep the discussion on track.

Date: 02-18-2005 10:05

Author: P., M. < @ .uk>

Subject Basic Teaching Skills

If you've had a chance to read through the module specification and think about the issue of "basic teaching skills", why don't you post a message here listing what you personally think are the most important basic teaching skills which are needed. Like so many things we deal with, definitions and interpretations of what we mean by "basic teaching skills" are never set in stone and always open to interpretation. So ***post a message with your perspective, perhaps dealing with your personal ideas on the topic and also thinking about the national context in which you work. Basic teaching skills may actually vary from country to country according to pedagogical systems, traditions and the needs of learners, and it would be great to hear people's views on these topics...***

Regards, M. P.

Date: 02-22-2005 14:43

Author: L., D. < @ .uk>

Subject Re: Basic Teaching Skills

Yes, it will be interesting to see if people from different countries have different perceptions of what makes a learning experience (or a teacher) effective.

First of all we should make the link between teaching and learning. There is an old joke in teacher training in the UK:

A man walking his dog meets his friend.

Man: "I have taught my dog to whistle."

His friend: "Well, I can't hear him whistling"

Man: "I said I had taught him to whistle; I didn't say he had learnt"

Perhaps our success as teachers can be best measured by how effective are the learning experiences we provide for our students. We need to bear this in mind when we think about "Basic Teaching Skills"

You can contribute to the discussion by responding to one or both of these two questions:

1. As a student, or in life generally, what has been your most effective learning experience?

2. What are the qualities of a good teacher?

D. L.

- 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.

Date: 02-24-2005 22:17

Author: E., M. < @ .hu>

Subject Re: Basic Teaching Skills

Hi Everyone!

….

Now for the questions:

1. <u>As a student, or in life generally, what has been your most effective learning experience?</u>

Doing something is the best teacher, I guess. ***I mean when I do system administration like installing a server for a specific task for me it's like finding the way in the forest. I know where I head, but I usually don't know much about the specifics*** (OK, I can do the basic installation even when I'm sleeping). I have to read several documentation, installation guides etc., and this way I find shortcuts, realise that something I thought is complicated in reality is very simple and so on.

To learn something I prefer that I am left alone to figure it out and realise the different aspects of the problem/new knowledge (though some help if I'm stuck never hurts). It's not necessary for me that the information is

useful immediately if I can see it is usefulness in the future. But if I can't see it's usefulness, then I have a real problem... (^_^); (I can easily get lost on wikipedia.org)

That said, I believe the teacher I remember most fondly was an American engineer who taught us many subjects (chemistry, informatics, programming, electronics, American history etc.) in secondary school (it was a bilingual one). ***There were several factors why I liked his classes***:

a. ***His classes were*** in the areas ***I'm generally interested in***.

b. ***His knowledge*** about the ***did not came from books only***, but ***he had experience*** (ok, not in the 1800's American history :)) ***He always entertained us with stories from his previous jobs***.

c. ***He taught us from the preparatory year until we graduated***. It's a really great thing to go to a class where one knows the teacher even at the beginning of the year. ***Even the air/mood of the class is different from when some 'nameless', 'faceless' teacher is with the class***. (I know there are always first times)

Unfortunately as far as I know since we have graduated no American teacher has stayed for more than a year.

d. ***The American teaching method greatly differs from the Hungarian ones***. It really was new for us.

e. The relationship was also different compared to the Hungarian teachers. ***It was much closer, like in the preparatory year we have had several 'parties' with them baking brownies or some other stuff. They were organising softball teams too.***

I know that my points are pretty subjective, but I think there is no all-rounder teacher who can win everyone's sympathy.

2. What are the qualities of a good teacher?

I think ***I've pretty much summed it up in the previous paragraphs***. Of course my description reflects my taste and there is someone just can't stand a teacher with one or more qualities I prefer.

…

Best regards,

M. E. - Hungary

Date: 02-27-2005 21:55

Author: T., L. < @ .fi>

Subject Re: Basic Teaching Skills

>You can contribute to the discussion by responding to >one or both of these two questions:

…

1. As a student, or in life generally, what has been >your most effective learning experience?

Most efficient learning for me takes place when ***I actively start doing something new which requires me to find out about things on my own***. Usually, I don't enjoy at all regular lectures and such kind of traditional stuff. But when I have to do something my self it's a whole new story...

For example, I registered Renoise (http://www.renoise.com) about two weeks ago and started learning tracking (FYI, which is a specialised way of making electronic music) with it. I had previously been doing tracking with ModPlug Tracker so I wasn't a complete newbie though. Anyway, Renoise has a very different GUI and approach and of course all hex codes for the special effects are different. I simply started writing a new song from scratch with Renoise finding out about things from the docs as I faced something I couldn't figure out by myself. Of course I had to start by printing out the hex codes of the different effects first to have something to begin with but apart from ***this I basically learned the program by using it, trying out things. This was a very rapid and effective learning process with a lot of inspiration involved within.***

2. What are the qualities of a good teacher?

The most important quality is the ability to plan well. Also it's very important ***to have a clear voice.*** (Nothing can be more irritating as a lecturer whose speech is nearly unintelligible.) You have ***to be quick in responding to different emotional hints you may be getting from different persons in class. You must make note of those students who aren't responsive to your current methods*** and ***make a shape shift according the new information***. This is of course very difficult if the group is very large.

Have to go now, perhaps later I'll write more...

- 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.

Date: 04-07-2005 11:09

Author: T., L. < @ .fi>

Subject Discussion about teaching a musical instrument

This is something I should have started a while ago but kind a forgot...

Currently I'm giving lesson in piano for three pupils privately (60min á person). I'm also working as a music teacher in elementary school where I'm teaching classes from 3rd to 9th grade, i.e. 7 lessons (7x45min) every Friday. The last class is a combined group of 8th and 9th graders and lasts for two lessons (2x45min). Music is not a compulsory subject for this last group so ***I have to work real hard to keep them interested in***. I've incorporated a lot of playing with musical instruments into my lessons in school so this job too consists of teaching a musical instrument although for a larger group rather than for an individual pupil.

In my work I have noticed how selection of musical programme is critical for the success of the lesson plan. You see most of the young persons don't like the music we 10 years older guys are used to listening to. Also, ***young persons need a lot of personal support from the teacher in achieving goals. That's why I find it at times difficult to manage with very large groups, as I cannot physically split apart into several locations at the same time. Luckily the school I'm currently employed in has a special employee for aiding with the slower pupils. I've found it handy having her at hand with the largest groups.*** This way I can for example issue her to the group of girls fighting over a glockenspiel and at the same time continue with what I was doing before.

With individual pupils I have found it beneficial to begin right on with reading musical notes. ***Some authoritative people*** (like Schinizi Suzuki***) say that you should begin with playing just by ear but I think this method can have more drawbacks than actual benefits. The most obvious of these drawbacks is the difficulty to learn to read notes later on and also a very underdeveloped prima vista or "sight reading" skill.***

I also like to give pupils assignments both in classical music where everything is written on the sheet and in pop music where you have to improvise the accompaniment for the melody by translating in real-time the chord symbols. This is something that is still very much neglected even by the most professional teachers. The reason for this is that these teachers belong to the older generation of classical musicians who don't know anything about harmonies or improvisation. All they can play is the stuff written on the sheet music and nothing else. This is however changing slowly as the conservatories are putting more and more effort into these things in teaching musical instruments.

Date: 04-11-2005 19:28

Author: H., A. < @ .hu>

Subject Re: Discussion about teaching a musical instrument

Hello!

You are fully right. I'd like to share my views about teaching a musical instrument for you. I must make it absolutely clear that classical music and jazz/pop/etc. music are very different from many point of view. My field is the second but I've learnt classical music too for two years. The main features: playing classical music means you are familiar with one's composition, you've learnt it's from note to note, the tempo changes, the dynamics etc., and you are playing from score. Whereas playing jazz means you've roughly learnt the composition's main melody and the harmonies and during the performance you are playing from your heart: this is called improvisation.

So, there are many ways to teaching music, but never forget the differencies between music styles. Indeed the ability of sight reading is indispensable in classical music but in jazz/pop/etc. it isn't anyway (but very useful and recommended). **In spite of this to my mind teacher must begin with reading musical notes in all styles. In classical music without doubt this is the only way to learn an instrument. Classical artists are as familiar with reading notes as with alphabet.** But besides in other styles students must learn playing by ear. ***Reading notes fluently -so called "sight reading"- isn't necessary. Much rather the perfect knowledge of the harmonic theory.***

…

A. H.

- 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.

Date: 05-11-2005 11:10

Author: T., P. < @ .hu>

Subject: main topics in discussion

Analysing all speaking on our module I can classify 8 topics:
T1: the most effective learning experience
T2: the qualities of a good teacher
T3: to test the learning abilities of the students
T4: Internet in teaching practice
T5: teaching in practice – technical drawing
T6: personal aspects of teaching and learning – making interest and motivation
T7: teaching in practice – musical instruments
T8: teaching in practice – economics

and others.

Tutor's questions (threads):
Q1: As a student, or in life generally, what has been your most effective learning experience?
Q2: What are the qualities of a good teacher?
Q3: Can we test the learning abilities of our students? How can we develop ones?
Q4: How can we take these facts into consideration in development of electronic teaching materials and planning of virtual courses?

Student's answers to second question:
- good communication skills (Lema Nuno),
- "establishing a bound with the young generations providing a non-conflict environment in the classroom" (Lema Nuno),
- showing what students can't see and by that pointing to new questions and new discoveries (Lema Nuno),
- personal relationship between students and teacher (Pedro Orlando),
- speaking with emotions and humour (Gabriella Toth)
- …

- 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.

Date: 02-25-2005 09:12

Author: T., P. < @ .hu>

Attachment pp_tp_velvitt.doc (347136 bytes)

Subject Re: Basic Teaching Skills

I think David's joke symbolises the complexity of the teaching and learning process. Teacher apt to concentrate on applied teaching methods which depends on syllabus. Sometimes he does not think of aspect of the student. Is the explanation clear for him or does this figure demonstrate e. g. the structure of this machine well? So on. I teach something, e. g. for my dog. :-) Is this "teaching method" efficient? I think the achievement is reflected in the knowledge of the student, from the point of the side of the quality and quantity. Saying with David's joke my dog can whistle or not. ***But I think it should be emphasised the teacher ought to have some information about the way from non-knowledge to knowledge. So the teacher should get into student's clothes.*** With David's examples getting into dog's coat. That is the real problem each student has different learning style.

So ***I have just written some of my ideas about connection between applied teaching methods and learning styles and I send a paper about these topics.*** My colleague and I tried to summarise the main theories of these questions.

…

I think the real questions are these: ***Can we test the learning abilities of our student?*** or ***How can we develop ones?,*** and ***How can we take these facts into consideration in development of electronic teaching materials and planning of virtual courses?***

Learning styles come from three theories: perceptual modality, information processing and personality patterns. My colleague and I demonstrate these paradigms, but I would rather concentrate on a complex model, in which I examined the connection of learning styles and the indirect teaching methods in attached paper.

P. T.

- 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.

Date: 05-15-2005 16:42

Author: T., P. < @ .hu>

Subject: general aspects to summary of discussion

The first question focused on learning effectiveness. It is important to emphasise that is the result of use effective teaching methods. The following factors are key elements of that: engaged academic learning time, positive reinforcement, cues and feedback, co-operative learning, positive learning atmosphere, high-order questioning, motivation, advance organisers.

Teaching elements can also be grouped into general models of teaching. In 1st model the emphasis is on the transmission of knowledge. Use of advance organisers and direct teaching methods are the main features. The 2nd model involves inquiry or discovery-based teaching. It emphasises the indirect methods of open-ended questioning and of building on student ideas. The focus of 3rd model is the quality of interpersonal relations. A positive classroom atmosphere is a central component of this model.

We should emphasise the need for a variety of teaching models. Instead of relying exclusively on any single model, it is suggested synthesising methods. Teachers thus need to practice the different skills involved with each method in order to achieve teaching effectiveness.

- The commenter's role is to comment on the ideas put forward by all of the above and help keep the discussion going.

Date: 03-03-2005 12:35

Author: P., A. < @ .uk>

Subject Re: Basic Teaching Skills

I agree with you. ***Some pupils I have taught seem to be naturally gifted and learn how to play their instrument without any problems. Others really struggle and have to put considerable y***

I have also noticed this on my placement. Some immediately grasp what is being taught, but others always seem to be behind or forget certain features such as which button to press to exit Microsoft Word. I find asking questions e.g. when giving a demonstration helps, as it gets them thinking, i.e. for the Internet 'what button do I press to go back to the homepage?' It also makes it more interactive for them.

Summary

The basic forms of electronic learning are Web Based Learning, Computer Based Training, E-learning and Virtual Learning Environment. A form of the application of electronic learning under traditional (face to face) teaching circumstances is Blended Learning. It is the form of teaching we selected while doing the modules Basic Teaching Skills and Computer Mediated Skills. Students got acquainted with the basics of VLE, the system of modules' objectives and requirements, the contents of the portfolio to be prepared and the rules of communication on discussion board within the framework of traditional education. Opportunity presented itself here also for a more extended consultation about the teaching plan to be prepared. VLE made it

possible to process the electronic ”background material” and to discuss it together with the teaching plan to be prepared.

Having completed students' activities in VLE it can be stated that the basic aims of those were communication, knowledge acquisition and thought. The results of these were active participation in a debate on discussion board, a fully developed teaching plan as well as experience gained during the realisation of that plan in teaching.

In my present work I took the various forms and means of electronic communication under close examination. Discussion board is an outstanding one of these. It is independent of time and space and it makes a flexible exchange of communication possible thus contributing to the further development of students' written communicative abilities.

After the examination of the efficiency of the teaching-learning process via discussion board the basic roles of electronic communication were distinguished: moderator, opposer, proposer, documentalist, researcher, rapporteur and commenter.

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Anton van den Brink - Paul Dirckx

Fontys PTH

Evaluation of questionnaires – Suggestions for choosing a VLE

Structure of inventory of virtual learning environments

1.1 Introduction

In the framework of the Velvitt project, an inventory was carried out of the four VLEs (Virtual Learning Environments) used within the participating institutions. The background to this survey is the fact that more and more educational institutions wish to use e-learning, and are actually getting down to work with a distance learning platform.

The objective of this survey is to find an answer to the following questions:

- What are the possibilities and limitations of the various virtual learning environments?
- What virtual learning environments are suitable in given situations?

The results of this inventory can be used by educational institutions wishing to make a choice from the existing virtual learning environments.

The document consists of an introductory chapter in which the structure of the inventory is described, a chapter describing the results and a chapter in which a number of conclusions and recommendations are made.

Finally: ***"The best VLE is the VLE that suits you best!"***

1.2 Question

In order to be able to compare different learning environments, a list was prepared of specific questions and statements relating to developers, managers, lecturers and students.

The evaluation aspects can be broken down into five broad categories. These relate to:

- the educational vision;
  - primary objective;
  - target group.
- the didactic functions;
  - cooperation possibilities;
  - communication forms;
  - coaching and support possibilities;
  - test and question systems;
  - possibilities for managing competences and skills;
  - possibilities for adding content.
- the organisation of education;
  - portfolio;
  - student monitoring system.

- Ø the functional structure;
  - interface;
  - ease of use.
- Ø the technical infrastructure;
  - data interchange;
  - methods for adding content;
  - standards;
  - etc.

In this document, emphasis is placed on the first three of these categories. In selecting a virtual learning environment, the first aspects the institution looks into are the areas of application and functions. The functional structure and the technical infrastructure generally are only considered at a later stage by the institutions.

1.3. Selection of virtual learning environments

The virtual learning environments used at present by the participants were inventorised in the Velvitt project. The table below shows the institutions and the accompanying virtual learning environments.

Virtual learning environment	***Educational institution***
WebCT	Tampere Polytechnic – Finland
Blackboard v6	University of Huddersfield – United Kingdom Budapest Polytechnic – Hungary
N@Tschool v8	Fontys PTH – The Netherlands
Moodle	Tampere Polytechnic – Finland Dunaujvaros Polytechnic – Hungary

Results

The table below is a summary of the most important results of the survey. The results are broken down according to categories. For a detailed overview of the results, you are referred to the document 'Summary results matrices depth test.doc'.

	virtual learning environment			
	WebCT	***Blackboard v6***	***N@Tschool v8***	***Moodle***
Educational vision:				
Primary objective	Making and offering online courses	Establishing tailor-made education (VLE has course management facilities)	Self-study and cooperation in groups, accessible via Internet	Making Internet-based courses
Target group	Groups of students	Groups of students	Groups of students	Groups of students
Didactic functions:				
Cooperation possibilities:				
Working in subgroups	+	+	+	+
Communication forms:				
Whiteboard	Yes	Yes	Yes, in new version	Yes
Chat	Yes	Yes	Yes	Yes
Video communication	No	No	Yes, in new version	No
Discussion forum	Yes	Yes	Yes	Yes
E-mail between VLE users	Yes	Yes	Yes	No
E-mail between VLE users and external users	No	Yes	No	No
Coaching and support possibilities	No specific facilities for process supervision	No specific facilities for process supervision	Contains a separate supervision module	Contains a separate supervision module

	Virtual learning environment			
	WebCT	***Blackboard v6***	***N@Tschool v8***	***Moodle***
Test and question systems	Yes, commonly-used question forms can be included	Yes, different question types can also be used	Yes, the VLE offers both open and closed test modules	Yes, different question types can also be used
Possibilities for managing competences and skills	No	No	Yes, there is an extensive competence instrument. The whole system is linked to the portfolio.	No
Possibilities for adding content	All types of content	Teaching material in all normal formats, but also the use of multimedia material (text, photographs, audio, video)	All types of content	All types of content
Organisation of education:				
Portfolio	No, no specific portfolio function. It is possible to make a presentation area, to be used as a portfolio	No, no portfolio facility present	Yes, there is a portfolio facility present	No, no portfolio facility present
Student monitoring system	Yes, there is a 'track students' function	Yes, there is an online grade list available	Yes, the study results available to the lecturer are registered	Yes, the lecturer can monitor all activities of the students on one page

Conclusions and recommendations

In this chapter, the criteria for selecting a VLE are described, followed by a summary of the inventorised virtual learning environments.

3.1 Considerations when selecting a VLE

First of all, the definition of a VLE. This can be described as: the technical facilities (hardware, software and telecommunication infrastructure) that facilitate interaction between:

- the process of learning;
- the communication necessary for learning and
- the organisation of learning.

A VLE which supports a flexible learning environment must offer the three following main functions:

- Teaching material / test section;
- Communication / cooperation section;
- Organisation / registration section.

Before a teaching institution selects a VLE, a number of considerations must be made, namely:

- What types of VLE are available on the market?
- What is the user situation?
- What requirements are imposed on the VLE?

3.1.1 VLE types

VLEs can be broken down into integrated VLEs and non-integrated VLEs. A characteristic of the first group is that the interaction is facilitated between the three key functions, whilst a non-integrated VLE only supports a particular aspect of the process of e-learning.

In many cases, the VLEs combine the three main functions using fixed components. There are also VLEs in which users can connect together the required components. The VLEs with fixed components generally assume distance learning at study/course level. The platforms that assume separate components are generally based on institution level.

3.1.2 User situation

At organisational level, broadly speaking, there are three user situations, namely:

- Distance learning as a supplement to existing possibilities.
- Distance learning as a replacement for part of the curriculum.
- Distance learning as the dominant teaching form.

3.1.3 VLE requirements

To test the usability of a VLE in all these components, it is valuable to take account of the wishes and requirements of various users.

Training institutions will also have to take account of following considerations when selecting a VLE:

- The intention of use of a distance learning platform.
- The readiness for the use of a distance learning platform?
- The flexibility and openness of the platform.
- The costs (consisting of fixed and variable costs).

3.2 Summary of the VLEs inventorised

WebCT

WebCT is a learning environment focused on making and distributing online courses, and as a result is extremely suitable for any form of support for contract education. Facilities such as a portfolio and possibilities for managing competences and skills are not available within this VLE.

Flexibility in determining the order of learning tasks (teaching material, assignments, forums, tests) is very successful within WebCT. Within this VLE, it also possible at any point to make a forum for discussion and/or exchange.

Using a standard browser, this VLE can be used by any user. If an institution is looking for a VLE that can be deployed reasonably rapidly, WebCT is a very good option.

Blackboard v6

The Learning System in Blackboard is ideal for deployment for institution-wide implementation. In addition, it is also possible to opt for the 'Learning Basic System', if broad implementation is not (yet) relevant. The latter system offers fewer functions, but in many cases is still perfectly usable.

It is therefore possible to switch from system to system. In addition, the system can be extended with additional functions, such as Building Blocks. These Building Blocks are software applications from other suppliers that can represent a welcome addition to the virtual learning environment.

One disadvantage is that Blackboard is relatively complex for inexperienced users, due to the multitude of improved possibilities. For people who are already conversant with the VLE, however, it is certainly an enriching experience.

Using a standard browser, this VLE can be used by all users. All standard formats of file (content) can be used in the VLE. Content management takes place within a course. There is also no content management system or a portfolio, in Blackboard.

N@Tschool v8

If use, management and exchangeability of content are extremely important, alongside the organisation of groups of students linked to study programmes, this virtual learning environment is eminently suitable.

This virtual learning environment offers extensive possibilities for its users. Within N@Tschool, students can work through digital material in the form of study routes (combining a number of study routes results in a study programme). They are also able to make tests and work (together) on projects.

One disadvantage of N@Tschool is that establishing and commissioning all possibilities and functions takes a long implementation period.

The operation of this VLE is very similar to Windows. To gain access to all possible functions, on one occasion only, software must be installed on the user PC. If only a standard browser is used, it is possible to work with this system, but not all functions are available.

Moodle

Moodle is a Learning Management System that can be used for managing course subject matter. Users are registered, and course participants' details are registered, whilst the system carefully selects the courses from a catalogue. Using Moodle, assessments can also be carried out online.

The possibility of multiple suppliers adding course information to and removing it from the system is a very strong point of Moodle. Moodle offers no facilities for a portfolio system, for example.

Finally, Moodle can be easily accessed by all users, via a standard browser.

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http://www.onderwijs.solin.nl/index.php?id=149&no_cache=1

http://moodle.org/doc/?lang=nl

Other information sources

Completed lists of questions and statements by participants in Velvitt project (see document 'Summary results matrices depth test.doc').

Reference work: 'Selecting a virtual learning environment', recommendation 2003, CINOP, Joke Drost.

John Kaliakatsos - Chara Haritaki

Establishment of a Central Unit for training the Educational Staff of T.E.I. of Crete in New Technologies in Education

Abstract

Technological Educational Institute (T.E.I.) of Crete, in Greece, conducted a survey among its educational staff members and found that there is need for training in new pedagogical methods and new technologies in education. A Central Unit was organized and put in operation for evaluating and reforming its educational program of studies. Expert groups were organized in different subjects such as: new trends in Higher Education, introduction of New Technologies in Education, use of new technologies to deliver distance education lifelong learning and training all around Crete, self-evaluating process of our Institution. Results are presented.

INTRODUCTION

Technological Educational Institute (T.E.I.) of Crete, in Greece, conducted a survey among its educational staff members and found that there is need for training in new technologies in education. Thus was decided to organize and put in operation a Central Unit for this scope. This is very important for the Institution because it is in the process of evaluating and reforming its educational program of studies and as it has six different branches all over Crete, new educational methods, as distance learning (synchronous or asynchronous) may help.

The organizational structure of this Unit consists of a committee with the responsibility to organize expert groups in the following subjects:

New trends in Higher Education.

Introduction of New Technologies in Education for the whole Institution.

Use of new technologies to deliver distance education, lifelong learning [3] and training at the six branches of the Institute, all around Crete.

Act as a first level self-evaluating committee in the process of evaluation of our Institution.

In order to achieve its scope this Unit has organized seminars for the staff members in the new technologies in educational methods and plans to repeat them for the next two years. It also organized new courses of multidisciplinary interest in order to provide both the educators and the students to work in groups and examine common problems from variant points of view. In addition, a group for delivering courses using telematics was organized.

CENTRAL UNIT OPERATION

A Central Unit was established and started operating at T.E.I. of Crete. Its purpose is to support the introduction and application of procedures that insure continuous restructuring of the different Programs of Study. A Department's Program of Study must be continuously adapted to the modern educational practices and trends in the economy and society.

The Directions of the Central Unit are:

- Support Self-Training of Professors at the new educational trends: (i)the usage of new technologies on multimedia and informatics and (ii)the introduction of new courses offered by distant learning for the wider opening of the Institution to the society through life-long learning.

ü Help to improve the quality of the produced educational material in electronic form, with the evaluation and support of the editing mechanism of the institution.

SELF-TRAINING

Even though professors of T.E.I. of Crete are of high qualifications, only a few have experience and knowledge of the application of new technologies on education and thus the following measures are taken:

1. Seminars were organized on the subject of New Technologies on Education to trigger the professors. Lecturers specialized on new educational methods, quality of education and evaluation of the educational process were invited to present their subjects to the professors of T.E.I of Crete.

2. Self-training courses were offered using videoconferencing, internet and e-forum on the education with new technologies. T.E.I of Crete has developed applications through the "Distant Learning" Programs conducted in the past, and there are today organized videoconferencing rooms in 3 branches.

3. A help-desk team has been created, consisting of specialist on informatics, multimedia, telecommunications, to offer support to professors (i) on transforming their educational material in multimedia form and (ii) on continuous self-training on new educational technologies.

ELECTRONIC MATERIAL AND SUPPORT

The Central Unit team, assisted by specialists on multimedia educational material production and students from the Departments of Applied Informatics & Multimedia and the Department of Electronics, is working on to:

1. Define the guidelines and create the platform for the development of Electronic Material through special software and in collaboration with the Library.

2. Organize the conversion of existing educational material in multimedia form.

3. Reform existing electronic material according to the defined specifications.

4. Create new form of electronic material to be used in virtual classrooms, remote laboratories, electronic forums, electronic meetings, etc.

5. Develop print form as well as electronic material for students learning disabilities such as perception, concentration and understanding problems in the framework of "equal opportunity to knowledge".

6. Organize seminars to training Professors on using new electronic teaching methods.

DISTANT LEARNING

The Cental Unit team in collaboration with the people that either have worked in the previous [1] "Distant Learning Programs" or have developed remote applications, accompanied by students from the informatics and telecom related departments is working on to:

1. Organize the videoconferencing rooms and laboratories [2], and their electronic telecommunication equipment that exists. Additional equipment will be bought as needed.

2. Train the personnel that is used for technical support for the distant learning actions. Specialists from other countries are invited to conduct part of the training.

3. Adapt the educational material needed for the courses offered through distant learning in order to be appropriate for the trainees as well as for assistance to the professor.

4. Organize modules, in collaboration with related departments, that are targeted not only for students but also for graduates and for the society in general.

CONCLUSIONS

The establishment of a Central Unit, for training the Educational Staff of T.E.I. of Crete in New Pedagogical Methods and New Technologies in Education, is shown to be of high value. In our society with continuously changing needs a special body is needed to assist the institution and help for better quality of education to be offered. The Central Units roll, in its first year of existence was the to assist on the self-training of the professors, set the guidelines and help to prepare educational material in electronic form, promote environmental education and consciousness, establish the infrastructure and operate the distant learning courses.

The first results from the above actions are very encouraging. A satisfactory number of students (more than 400) have attended the multidisciplinary courses. More than 40 courses are delivered electronically and there is an interest from the professors to attend the training seminars for the new technologies.

In the future, the Central Unit is aiming to develop an evaluation method and its application for the evaluation of new educational material. It will be also used as a measure for the evaluation of the existing educational material that is used by the Institute. In addition, it will promote new forms of publication for the scientific material as well as for the laboratory material in order to be also useful to the students with learning disabilities.

The actions taken as well as the proposed actions of the Central Unit are in accordance and can be combined with those proposed by the departments and are aiming for better coordinated actions for the overall upgrading of the syllabuses of the Undergraduate Programs of Study at T.E.I. of Crete. The continuous evaluation and the usage of the results will improve of the quality of education offered at T.E.I. of Crete.

ACKNOWLEDGMENTS

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Balázs Ádám Tóth

STRUKTÚRA Quality Development Ltd.

Quality and Monitoring

Introduction

Examining related Standard a project model was set up. According to the model some general and some project specific QA procedures were developed and also decisions were made which are the prescriptions and requirements that are less beneficial for use.

Monitoring of both products and processes of the project aimed to give additional support for partners, to be able to give direct and immediate information about their results.

Activities of Monitoring quality control in the procedures gave assurance and helped in keeping deadlines and the agreed quality requirements.

Quality framework and assurance processes for the project

QMS policy was based on four major features of the project:

- The contract and the referenced regulations of the Velvitt project itself contained predefined QM rules.
- All project institutions have their own quality management system and all members should therefore comply with the given requirements.
- Most of the project institutions and members had previous project work experience
- All project members have knowledge about the definitions, theories, methods used by a QMS

Regarding QMS policy agreements were made between the project members at the beginning of the project. The purpose of these agreements was to make clear how QM will support the project and its products. As a result of the agreements processes were documented where each institutions could use their own QMS and processes were documented as reference documents such as “Document and data control” and “Procedure of design process”.

Relating the Products of the project a product life cycle was designed and product control methods were introduced to the project members so that all members could count with the internal aims of the quality control.

The title of the policy agreement is:

- Quality management policy and reference documents

The policy, the reference documents were the bases of the project QMS, the monitoring plan and activity.

Examining the quality issues of using VLEs

Along designing and performing QM function, Examining the available VLEs certain features of the different software appeared important to be able to compare with each other. It is important for both the comparison of VLEs and the module harmonisation point of view. To support the vocational work of the other institutions STRUKTURA examined the quality aspects of the available software related standards and suggestions were made about important VLE software features to be examined.

Also an analysis was performed to investigate the currently available Standards related to the QM issues of development processes to gain further information about Quality control possibilities.

In several training institutions STRUKTÚRA designed models for development procedures according to different standards. Using the previous experience on the practice of using those models and the result of the analysis a development model suitable for the project was designed and suggested to support the module development work of partner institutions.

The work on quality issues of software related standards and the developed model for Module design process was documented:

- Evaluation of software related standards and Proposals for Quality Procedures

Monitoring quality aspects of products (new module development, product, users)

In several countries of partner institutions as well as in Hungary Quality Management Standards for the Educational sector were published and introduced with more or less success.

Examining the publications and the practices using those QM models some disadvantages were discovered by several facilitator and developer companies. One common problematic area is always that quality management methods are not specialised for the needs of specific environments. Therefore the implemented QM systems can not be effective enough so that the management can benefit from the output of the systems.

Quality issues in curriculum development itself is a specialised area especially if it is in a VLE environment. Without developing en entirely new standard or model, we collected the risky questions from different standards and models.

Some of these questions were documented and some questions were discussed between the project members in detail to avoid mistakes that can be made during developing the curriculum. The major questions and the discussed subjects were documented:

- Quality management in VLE Curriculum development

Monitoring of Velvitt project (processes)

Monitoring activity was planned for the beginning of the project and was slightly modified after the first meeting in Huddersfield, because in the plan we had to take into consideration the differentialities of the institutional QMSs. Agreeing the plan the overall aim of the plan was that it should serve the project and not itself. Therefore simple, quick and effective methods like interviews, phase questionnaires and document reviews were chosen. The written questionnaires themselves were short and straightforward, so that they do not contain unnecessary point.

The analyses of the feedback information related to project management, project administration, project achievements, responsibilities etc. in the main phases of the project showed that the project is keeping its deadlines.

All project participants agreed that there are no serious failures, which need action to assure the achievement of the set up project aims.

Project aims were achieved in the updated deadline, responsibilities of project tasks covered their role entirely, presentations were effective, pre set up timetables were kept correctly, communication platforms ran properly, project management was well organised.

Only few small suggestions (comments) were made about the communication of one project meeting preparation, but it had no following effect on the project.

For the purpose of supporting the internal monitoring independent external monitoring professional was delegated to give an independent view of the work carried out by the project.

As a result of both internal and external monitoring in short the overall picture of the project and its achievements were good, correct.

The following suggestions were made relating the project processes and products:

Regarding the dissemination of the project one participant suggested to widen the dissemination so that the achievements of the project can be spread widely in the education sector.

Using the homepage of the project more information were given to users about the project and the next dissemination was designed in a way that even more people could have access to the running project.

Also the conference was widely advertised and via video and internet technology there is a possibility to all conference members to take part in the conversations on line.

Collect data of using VLE in the participating institutions

In the design freeze phase of the project the project institutions agreed, that changes in VLEs will be followed up regarding the existing VLEs and new VLEs as well. Some institutions changed their Virtual Learning Environment some had experience with more VLEs.

Before any questionnaire was designed for the evaluation of different VLEs there were lot of team works to be able to set up the basic elements of the comparison.

Contribution to data collection was made and data evaluation was carried out by the Dutch team.

Quality and Continuity

In QMSs most QA procedures are based on cycles. These cycles have resources from human creativity, from feed back information of previous cycles or from the changing environment. The cycles, the procedures should change continuously to be able to meet the requirements of the changing needs.

To be able to perform quality work in different environments, those who manage their own systems should not wait till a new model or standard is issued. The current demand from management systems is that they should develop themselves taking into account the specific quality requirement of the specific sector.

The Quality of Virtual Electronic Learning products in Vocational Initial Teacher Training very much depends on how the possibilities and the limitations of the environment is understood by the system managers including the QS managers. Also it depends on how sufficiently quality aims are set up and how effectively quality procedures, cycles can be developed for the users: Students, Teachers, Developers, Operators, Administrators.

In the future, learning from this project, quality procedure of module development can be refined and adjusted, specific quality measures can be set up for the evaluation of training materials and results.

One future plan could be to work out measures of delivery and effectiveness how Virtual Learning Environments can support the training needs of different vocational institutions.

Teresa Oliveira, Alcino Pascoal, Lourenço Frazão

New University of Lisbon

"e-Tutors' Training Profile"

There are a deep discussion about e-tutor and mentor, we agree with Hubal and Guinn (2001) when they said that mentoring perceived as the last stage of a progression that starts with tutoring and is followed by coaching. As well as we can found different understanding for the online education and e-learning. However, the e-learning concept was generalised and transferred for any process or teaching and learning based online information.

When we design or promote an e-learning course, we should pay attention on: students, the e-learning course it selves and the technology.

i) Concerning the students, we take notice that nowadays who are involved in the teaching-learning process through have differentiated educational experiences and good technical skills, such as using computers and gathering info from the Web. Another important point for the e-learning its to understand that the students have economical, cultural and ethnical backgrounds more diversified then before, but , at the same time they need to learn permanently, in order to pursue their success in a global society driven by high-tech competition.

ii) When we plane an e-learning course it must be the result of extensive knowledge and experience about fundamental issues such as role of tutoring/mentoring, training, and learning. Another important point is that the course materials should be structured in a way that facilitates individual study and provides clear information about the development of specific competencies relevant for learner's professional and personal growth.

The evaluation and assessment should be on mind when the e-learning course is planned. Therefore, the procedures should be adjusted to the nature and scope of the e-course.

It is necessary to recognize that the involvement of all community is crucial in e-learning because, without the active support and participation of a "learning community", there is no online course.

iii) Nowadays, the information communication technology it's a challenge to the educational system, to training and students themselves. It affects the way we deliver instruction, how we interact with the orders, specially our colleagues, how we teach and how we manage and change our pedagogical and didactic attitude and provide curricular innovations.

e-Tutors Roles

For the e-tutors training, it is necessary to know their roles and competencies. The e-tutors are not only an expert, but also a mentor, facilitator, motivator, counsellor, coach, administrator and assessor. He (she) could even be the person responsible for the technical support.

Probably, one of the e-tutor main roles is to set-up the "learning community", in order to facilitate discussion, to intervene at key moments and to be a co-learner. Additional role is to implement pedagogical and communicational processes, in accordance with the specific situation and maturity of each group of learners.

e-Tutors Competencies

The e-tutor should have competencies of different nature, such as pedagogical; technical; managerial; scientific; communicational and social. However, the tutor can perform distinct competencies in accordance to the timeline: “prior to the course”, “during the course” and “after the course”.

“Prior to the Course” the e-tutor must have clear knowledge about course requirements and goals; define participation and grading criteria; manage student expectations; allow flexibility and negotiation; communicate in clear language; use whatever technology; develop exercises that take advantage of the web and manage various evaluation tools.

“During the course” the e-tutors should act as a “facilitator”: on course content and the development of the “learning community”; promote “collaborative learning” and cooperation among students; help students being integrated within the institution and its culture; to be acquainted with the specific needs of new students, who might be unfamiliar with the adopted VLE (prevent them of fear and anxiety); promote active learning techniques; use the best practices for enhancing the participation of peers; motivate students complying with deadlines and agreed-upon working times: emphasis on time for task; evaluate students and to give prompt feedback; foster learner centeredness; promote reflection; help students identifying their strengths and weaknesses; assist students developing critical thinking skills; encourage students bringing up real-life examples to the online classroom; contact students (typically by phone) who are not participating or are disruptive; respect privacy and to bear in mind that there are real people attached to the words on screen etc. etc.

“After the Course” the e-tutor have to reflect on the course as a whole, that is: the exercises, outcomes, roles, and student comments; use those for students’ evaluation process; provide prompt feedback to students on final assignments and tests and continue respecting individual privacy issues after the course has come to en end.

e-Tutors Training

The e-tutors training are an excellence way for assisting individuals in the acquisition of new skills.

Tutors’ training for online teaching requires the one to move beyond traditional pedagogy and to adopt new and easy-to-use practices. Therefore, tutors need specific training and institutional support in order to be willing to adopt new teaching paradigms. At the same time, tutors require specific training programs addressing core technical issues and selected written materials. However, it is difficult to predict who will perform well in online tutoring, even for teachers who have good records in conventional learning environments.

It is unreasonable to expect from well-experienced teachers in face-to-face teaching to suddenly begin doing well by using a VLE, but there are exceptions.

A small number of tutors have themselves been instructed via online education, and those tutors need specific training in order to understand how their courses shall be implemented in the new learning environment.

In order to implement e-tutors, training we argue that it should be based on communities of practice, based on multidisciplinary teams, formed by individuals who have different life experiences and are strongly committed to the success of learning. Tutors have to put aside isolation, and respect the individualism and their privacy. Besides this the e-tutors have to encourage interaction among students and to move well beyond simple collaboration activities onto real and authentic “learning communities”, centred on practice.

We suggest a training forum for developing e-tutors' competencies in synchronic and asynchronous communication. Therefore, training forum enables its participants to be engaged in collaborative learning through online discussions. To develop those competencies the institutions should set-up the training forum mentored by an experienced e-tutor. To do that we can proceed in two steps starting by providing a mutual support learning community, but further proceeding into strategic development of enlarged existing trainers' learning communities in order to facilitates communication among all.

Conclusions

Tutors need specific training and institutional support to adopt new teaching paradigms;

Specific training programs addressing management, technical support, communication tools and competencies synthesis in written language and selected materials is required;

It is important developing e-tutors' competencies in synchronic and asynchronous communication in order to enable the participants to be engaged in collaborative learning through online discussions;

Training based on multidisciplinary teams within a communities of practice, help tutors to play new roles;

The "learning communities of practice" (inside and outside educational institutions) is crucial for decreasing the constraints of e-tutors' training**.**

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Psychological Aspects of E-learning

Electronic learning has been determined by three factors: the demand appearing in adult teaching; the development of computerized teaching materials; as well as the widespread usage and reliability of the Internet.

Dewey and his associates redefined the contents of adult teaching and extended it to lifelong learning.

In his famous report on higher education, A. L. Smith stated that lifelong learning was not the luxury of the privileged, but a permanent national need, which is an inseparable factor from civil rights. /5/

The attempts of reform are present from almost the very beginning of the Hungarian public education, which can be seen in different forms of education. The revival of lifelong learning in Hungary has brought nearly immediately electronic learning, too.

How can this very special and very new learning method use the older and newer achievements of psychology?

The behavioural approach: (Thorndike, Pavlov, Watson, Tolman, Skinner) – we have hoped for the result of learning, as a change of behavior, as a result of the methods of learning theories, and the repeated effects from the immediate surroundings and syllabus. In an artificial environment, with extorted answers. In the 1970s, at Bánki College we used teaching machines developed on this theoretical basis. These experiments did not bring considerable results. Since the 1980s, the ponderous equipment has been replaced by computer systems. It is only the computers developed in the last decade that have given the chance to create intelligent electronic syllabus. In this period of time the Internet has also become more and more widespread in Hungary, as a simple method of acquiring and checking knowledge materials.

The cognitive approach: (Koffka, Kohler, Lewin, Piaget, Bruner, G. Kelly) The theory which considers the internal mental processes, the laws of consideration and processing of information. E-learning draws our attention to the logical division of the syllabus and the importance of clarifying the connections between some certain learned elements. Nowadays the capacity of computers gives opportunity to the visual support of the less interesting materials as well; and it is a possible method of development of the engineering /teaching thinking. It is an especially appropriate approach for the already graduate individuals.

Humanistic approach: (Maslow, Rogers, Angyal) It sets out from the total acceptance of the person; this is why it is especially suitable in the first phase of the teacher-training education. It is a preferred approach within the framework of psychology and self-development. This way, during the small amount of contact-hours, the students struggling with confusion, self-estimation, and inferiority complex get support to try the role in order to find their way to development. It is only when we get rid of our fears that we are able to choose an independent way.

The positive psychological approach: (V. Frankl, M. Csíkszentmihályi) A theory less known and used in Hungarian teaching practice. It is oriented towards future and values. The short-term goals are not considered enough to ensure a stable development of personality. Only the belief and values pointing well beyond my own being can help find a way out of the difficult situations in life.

The value-oriented and positive approaches are important, as we always find what we look for. If we look for the students' deficiencies, we will surely find them, and the conflict never ends. If we look for their virtues, we will find them, too (Pygmalion effect). They would want to meet these more positive requirements. The network syllabus provides little human/emotive basis. We have few contact hours at disposal to provide emotional support; but we can succeed only if we are truly aware of our role and meet the requirements of our vocations. From this point of view, the tutor is not only an expert, but he is a co-worker, a contributor, guided by his own values. According to Frankl, one has to find his reasons and his mission in order to be able to lead a complete and full life, which gives an opportunity to /2/ fulfillment (Zsók). The values are missing from the self-realization of the ideal of human psychology.

Freud denied the question referring to the reason of life, as he thought that neither the reason of life, nor the values exist objectively. He considered them a form of neurosis if someone raised these issues.

On the other hand, Jung – based on his several decade-long analytical practice – stated that all his patients older than 40 suffered from losing their religious approach and harmonizing values. None of them was able to recover totally unless these values were gained back, independent of the patients' religious denomination.

According to pofessor Zsók, apart from teaching, a tutor is a representative of both existential truths and values.

We performed a research in order to relate the very smattering Hungarian experience. A group reached a remarkably good result. We were looking for the reasons. **In learning methods and emotional disposition.**

Research:

Within the frameworks of distance learning and regular courses, our institute qualifies engineering teachers; and in correspondence courses, technical vocational teachers. Apart from the small amount of contact-classes and the traditional sources of knowledge, our students can also acquire the necessary material by e-learning, too. The last year's groups of distance-learning students were a surprise, as their school achievements were much better than the ones who attended the correspondence and regular daily courses. In our research we wanted to find out how they managed to reach such an outstanding achievement, in spite of the very few classes and the teachers' explanations.

We thought, it was the different, more effective learning style and strategy in the background – and for this reason we examined the style of learning (the author of the questionnaire). 39 college-leavers – 8 distance learning and 13 regular students – took part in the research. The distance learning students are already graduate people and have considerable work experience. Those attending the correspondence courses have work experience, and are about to getting their first diploma. Those attending the regular daily courses are about to getting their first diplomas, mostly right after their high-school studies. The degree of individual learning was examined with special care. The individual learning style was expected to be more characteristic to the students of distance learning and correspondence courses. However, the questionnaire has brought surprising results. On one hand, there is no significant difference between the students' learning styles; on the other hand, the individual learning style dominates with more than 50% of those examined. Moreover, the collective learning method is barely practiced, independent of the effectiveness of the preferred learning methods.

Since the questionnaire regarding the learning methods did not analyze the reasons of the differences between the achievements of the groups, and for this reason we performed a qualitative research as well.

LEARNING

Code	Average school Achievement	Metaphor	Comment	Emotional colour	Collective terms	Total metaphor
t1	4	development process	it makes you better	R	blooming	**gardening**
t5	5	training	you'll become better and better at it	R		
t7	3	fulfillment	the world becomes wide open and recognizable	R		
t2	4	work assignment	I have to compel myself at it	O	indispensable	
t6	5	breathing	it is necessary	Y		
t3	4	river	it changes continuously	Y	never ready	
t4	4	life	it takes the whole life	Y		
t8		Lego	it builds up from small parts	R	puzzle	

The students were asked to express learning, their aims, and the concept of problem solving with a metaphor. We assumed this research would shed light upon the emotional and motivation background of the above mentioned concepts. The research did support all this.

The metaphors developed after summarizing the results give a splendid picture of the emotional attitude of the students.

	Learning	**My goals**	**Problem solving**
Distance learning	gardening	pilgrimage	hurdle race
Correspondence course	reach the land	Don Quijote	orienteering
Regular, daily course	saving	sailing	orienteering in the dark

E.g.: learning – gardening – while the other group considered it equal to getting shipwrecked to the land; this indicates that the correspondence students recognized the importance of learning from the point of view of getting a job or a promotion, and for them learning represents the last chance, the chance to survive.

It is especially interesting that in contrast with the regular and correspondence students, the distance-learning group did not show up any element regarding learning which would have represented learning as a torment. The analysis and summary of the metaphors related to the distance learning students' goals compares to hurdle race; while the correspondence students compare them to Don Quijote. Based on the answers given to the problem solving…

To sum up, it can be stated that there was a significant difference between the three groups' emotionally defined fighting strategies.

- The majority of those with the best school achievements in distant course (4.2) associate learning with positive attributes and ideas. Their prospects of future are attractive, their goals are well defined.
- The correspondence students are ready to fight (to learn) (3.3), but their idea of future is risky and dangerous. Their goals are of short-term, changeable and hard to define.
- Regular, daily students (3,2) ideas about the learning: it's a bank deposit. Their goals are not defined, only „sailing in good wind". Problem solving style is „orienteering in the dark ".

What shall we do?

With all due respect and not neglecting the elaborate and intelligent syllabus of the Behaviorists and cognitive psychologists, we can state that the possibility of stepping further and the additional energy hides in emotive identification, values, higher goals, and flow**,** especially in teacher training areas.

According to Adler, the real test is our relationship with work, love, and community. So far e-learning has ensured mostly work. The teachers do not have any more energy left for developing positive emotional attachment or community life. The students react in much differentiated ways to distance learning and correspondence courses. Many of them are anxious, and only a few of them enjoy the courses. There is an infinite amount of logical, clever information bases and books./4/ Our rational mind can get everything – more than it wishes.

...nature and art together

can prove to be nicer

(Goethe: Nature and Art)

The personal relationship and co-operation with the tutor mobilizes extra energy. It offers the advantages of the model-imitating behavior, and helps the emotional identification with the task.

The right hemisphere of our brain is not only the home of our foolish emotions, but it gives home to other energies that are capable of almost anything. Here is the ability of transfer without which there is neither good, intellectual, creative thinking, nor problem-solving. However, it is not right and proper to talk about it. Sometimes the scientific academic lectures surpass even the dullness of bad teachers.

Since Plato, who considered emotions irrational. The European thinking (in contrast to the Asian one) banished emotions. It defined them as a counterpoint of scientific thinking – not as its possible partner. Descartes said "If I want to think, first I demolish my emotions". Kant, on the other hand called emotions the disease of the mind. After such precedents it is no wonder that we hardly accept the treasures of the right part of our brain.

We all know that the holistic approach (emotional and cognitive together) has made a breakthrough in healing, psychology, and other areas of life, but it is still not present in general thinking. /3/

The information capacity of an average person is 126 bits. In 70 years, supposing a 16-hour daily activity, he can process maximum 185 billion bits. This seems a lot, but in fact is not. A library has a large multiple of it; the Internet has even more information than that.

What shall we choose, what screening shall we use for values? This is one of the most important issues nowadays.

The media, the advertisements, and the state – all are trying to get hold of the free bits of our brains, in order to keep their influence. Thinking is a great treasure.

Our interests, our values make the decisions; our attention does the selection.

No great jobs can be accomplished without a positive emotional attitude. Unless we do so, we get bored with it, we will hate it, and we will get sick of it. Csíkszentmihályi called this state FLOW, and it is our job to get our students acquainted with this state. Such a state can be reached by work or learning without help as well, but only few people can experience it. /1/

It is a good method to relieve anxiety and enhance performance – and it is absolutely human.

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e-Learning Strategy in Hungary

Introduction

The successfulness of learning depends on different environmental conditions, too. In most cases the traditional paractice of education provides the closed system with linear arrangement of learning materials to be learnt, where it is the instructor who actively mediate the knowledge, and students, who are passive and receptive, receive this knowledge. The evaluation generally takes place at the end of the process. The current practice of education expects the establishment of a learning environment differing from this. This practice is based on the assumption that students do not take over the knowledge as a complete system, but they actively take part in acquiring it themselves, and practically, we can say, they create it with their own construction. Accordingly, a learning environment should be established that provides students with large scope of activity and opportunities. A good opportunity for this if we create real problem situations, in which students' activities have the leading roles in solving problems. Accordingly students have the leading role in the process, and to which instructors accomodate their supporting, assisting and instructorial activities.

Since when the appearance of the continuously growing information technology in the education institutions, on establishing learning environments, we have to take into consideration its influence on the environment as well. New electronic media equally make possible the establishment of an environment corresponding to the traditional and constructive conceptions.

Distance Learning, ICT in the European Union

Since 2000, the European Union has stepped up its activities addressing the challenges of the Knowledge Society to improve learning and to develop skills. In December 2002, the e-Learning Program (2004-2006) emphasizes the importance of the integration of the ICT into the education. The eEurope Action Plans have put e-Learning and eSkills high on the political agenda. Digital literacy is emerging as a new key competence required by workers and citizens for the Knowledge Society. The 2004-2007 e-Learning Programme, research projects on technology enhanced learning in the IST programme, projects in the eTEN programme, as well as projects in the European Social Fund 2000-2006, have demonstrated how e-Learning helps create new forms of learning within the education and training systems, at work and in society at large. The European eSkills Forum recognised the crucial importance of e-Learning for designing innovative e-skills training solutions. The launch of the proposed 2010 and Lifelong Learning programmes will provide renewed impetus to the efforts to use ICT to improve learning, help workers acquire key skills and support society to become more inclusive.

Despite the considerable efforts undertaken, the e-Learning sector is still fragmented and there are many open questions surrounding the use of ICT and the skills needed to participate in the information society. Skills have a considerable role to play in workers' adaptability and employability. Europe's ability to remain competitive, achieve higher employment and future economic growth requires more effective investment in human capital through better education and training. ICT has a considerable role to play in achieving this.

The conference, taken place in 2005 in Brusselels underlined the need for a step change away from traditional learning models and particularly that:

§ individual learning requirements must be addressed for a personalisation of learning experiences;

§ the use of ICT can improve the effectiveness of learning and enables society at large to access learning, and this is especially true for people who would otherwise be excluded because of their disabilities, location, gender or age. This increases inclusion and participation in the workforce and contributes to the availability of lifelong learning for all;

§ the use of ICT supported learning helps workers acquire the necessary skills and knowledge for their job and personal development, which has a direct influence on European competitiveness and economic growth, and thus helps to create more and better jobs;

§ digital literacy is a fundamental element of the knowledge society. Ensuring that everyone has the necessary skills, competences, experiences and attitudes to make effective use of ICT is probably the biggest challenge of all;

§ ICT contributes to more efficient teaching and training processes, helps foster and support innovation in pedagogy, and makes the act of learning more efficient and effective. It also supports transformation within education and training institutions, which will lead to a substantial improvement in educational quality;

§ multi-stakeholder involvement in the development of e-Learning services, the identification and the promotion of good practices and the integration of ICT into education and training has proved to be essential for long term success. The European Commission and Member States are encouraged to make increased use of this form of dialogue and partnership for action.

On the basis of the eEuropa strategy, announced in March 2000, which “sets the objective for the European Union to become the world's most competitive and dynamic knowledge economy” in order that 81 million students, 5 million instructors and several millions of adults taking part in education should become connected with the programmes, and then in May 2000, on the basis of the „eLearning Action Plan”, published by the Eurpoean Commission: Designing tomorrow’s education, an intensive work began in the Member States.

While the computerizing programme set the objective that it would win teachers over in Germany, in Finnland, the objectives of the national information technology programme are the teachers’ training a further education.

The Situation of Development in Hungary

Review of the Hungarian Situation

For years there has been a striving for that the distance learning on electronic basis should break through in Hungary.

In Hungary, we can speak about the experimental phase of distance learning from the 1970s, however significant development conceptions aiming at the distance learning and open training appeared form the beginning of 1990s only. It is in this period in 1991 that the National Distance Learning Board (NDLB) was established as a consultative organsiation of the Ministry of Education, the activity of which was focussed, firs of all, on strategy development, preparation of decision making as well as keeping contact with foreign professional organisations. Following its establishment, the NDLB brouhgt into being the Expert College of Distance Learning (ECDL), which worked for two years. The Board together with the ECDL established the first six Regional Centres of Distance Learning in

Hungary in 1992, and continuously developed international co-operation projects. The six Regional Centres of Distance Learning began to work, and work even today, in the framework of higher education institutions. In 1996, additional four new centres of distance learning in special fields were established. In 1966 the organisations of universities and colleges established the National Distance Learning Association of Universities and Colleges, which covers the whole country. The work done between 1992 and 1995 was co-ordinated by the Gödöllő Agricultural University. The Board took a significant hand in the creation of the infrastructural basis and methodology of distance learning and in the training of the required staff of experts.

Of the joint projects of the Ministry of Culture and Public Education and the NDLB, two projects started in 1995. One of them is an international-related project, and it aims at the establishment of the Regional Network of Distance Learning of Eastern Central European Region. The other project is Hungarian-related, its name: National Phare Project, which was developed by the Phare Inter-Departmental Committe in 1995 in order that they can support the development of learning material and distance learning and the performance of tasks of distance learning.

Thenceforward several organisations and institutions dealing with distance learning began to work, of which the most significant ones are the Hungarian Foundation of Distance Learning and the Public Foundation of Open Vocational Training (PFOVT). With the aid of the allocated significant funds, this latter promoted the registration of open vocational training programmes, the starting of new trainings, the initiative of methodological and marketing activities, the establishment of educational network of information technology. The Apertus Public Foundation, established by the Government and the Ministry of Education, can mean further assistance in the integration of distance learning organisations working with governmental support and in the financing of development programmes and in the motivation of methodological developments.

Higher education institutions were the first that introduced open programmes of distance learning in addition to their existing programmes. Of them it is the higher education institutions of Gödöllő, Pécs, Veszprém, Győr and Deberecen that are outstanding. By now the higher education institutions of Dunaújváros, Szolnok, Miskolc and Szeged have joined this group, and significant distance learning services have been developed at the Budapest Business School, at the Corvinus University of Budapest and at the Eötvös Lóránd University as well.

When the e-Learning frameworks and technologies available in Hungary at present were developed, it is not the demands of higher education institutions but those of the business sphere that were taken into consideration. These technologies as well as the methodological background connected therewith originate from abroad, consequently they do not take into consideration the local features of either the language or the culture or the educational system. The increasing initiatives of technology, methodology and learning material development have resulted in solutions that widely differ from each other several times. Their merging and the collection and systematization of accumulated experiences and putting them in a unified framework have become timely.

Why Is It Good?

In the frame of the traditional classroom training, it is very difficult to update the existing learning materials at a proper speed, and the additional costs of education is also high: rent of classroom, instructors' fee, travel, accommodations, and at last but not least the drop-out of students' working time. The e-Learning (electronic distance learning), an up-to-date education form aided by means of information technology can provide a solution to these problems.

Of course, that is not the question that this new form of education will take the places of all methods used up to now and it will cover some demand on education at a low cost by no means. E-Learning can be effecive means only if by mixing the existing traditional form of classroom training and the electronic distance learning form, we can successfully create an optimum harmony, where speed and cost saving do not reduce the quality of the training and the content of knowledge transferred. There are a lot of instructional areas where personal contacts between instructiors and students are essential.

The distance learning itself as a method is not a new invention; universities and colleges have been applying it for very long time. The electronic distance learning is a novelty in the sense that students access learning materials through computers, local area networks or even through the Internet, and they learn with the aid of computers and they practice the acquired knowledge by means of computers. This technology allows students to time learning according to their possibilities and requirements and not to travel to the spot of the training and to go through lessons again at any time.

CD or Network

The solution forms of e-Learning can be grouped from a lot of points of view. One of this forms, for example, is based on CDs (students receive learning materials on CD, and they can start learning after installing them on the computers of their own) or another form when the e-Learning is based on a network (students access the learning materials on a central server through a network (intranet or Internet).

In both cases learning materials to be learnt are available in electronic form, and the main difference between them lies in the tracing of learning. While in the first case, it is hard for the person co-ordinating the learning to get up-to-date information about the progress of individual students and the results of examinations and what questions they have got etc, in the second case, theses data can eaily be retrieved from the server.
In 2004, the preparation and development of the national information technology development plan also started.

The basis of the plan is the establishment of a unified educational system of information technology by involving the players of the market, which covers everything from the school administration through intelligent cards to learning at home via Internet. Some fundamental priciples followed during development:

- A unified approach integrated from every point of view has to be applied, and the applications of the public and higher education institutions have to be imagined in the same model,
- The existing applications and solutions have to be taken into consideration, and they have to be integrated in the unified system,
- A unified and centralised identifying educational system has to be created, Its legal possibility will be established on the bases of the amendment of the Act on the Higher and Public Education under development and before approval,
- Attempts have to be made to achieve regional approach from the points of view of data collection and applications as well,
- The Közháló-Sulinet (PublicNet-SchoolNet) telecommunications and Internet providing system can be regarded as a basis all the time, and the database and application layers outlined above are built on this.
- Contents stored in real digital form have to be widely provided for the ICT-based solutions.

- To achieve the maximum potential effect, proper instructional-methodological developments have to be implemented, and the attainment of necessary competence and skills have to be ensured.for instructor-educators and administrative staff.

- In the heterogenous situtation having developed in the public education, there is approx. one computer for 27 students. In the higher education, there is approx. one computer for 15 students. ICT means for the support of training are used in less than 1% of the classes. On the basis of surveys conducted on educators' activities in Hungary, we can say that the minority of educators and teachers have experience in computer operation, and it is only a small group of them that is able to use ICT means in teaching. (Éva Tóth: Teaching and the use of ICT in Hungary, 2002). This situation makes impossible the attainment of the proper skills in use of ICT means, which is, in turn, indispensable for further studies, taking up work as well as lifelong learning.

For What Can ICT Be Used in Education?

- In the era of the information society and the increasingly significant propagation of ICT means, the integration of information technology and the innovative applications of ICT means into the life of public and higher education and science and research at the highest level are indispensably important. The necessity of the use of developments and applications of information technology appears as a requirement of stressed importance for the whole Hungarian education in the context of the European Union and the region of the European higher education (as well as the Bologna Process) and research.

- The basis of the use of info-communication means is the expectation of labour market, which is generated by the ICT applications that has already become general in the market. Additionally, education aided by ICT means ensures the following possibilities:

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- In addition to the presentation possibilities of multimedia, more effective lectures with the applications of frontal educational methodology.

- CBT – Computer Based Teaching; It is the means of ISS (Interactive Study System), but it significantly assists the competence-based training corresponding to individual learning and skills, and the training of persons having disturbances in some skills and those at a disadvantage or requiring special training, while it ensures the possibility of an integrated and collaborative education.

- e-Learning (distance learning + CBT + LMS) – It is the means of independent and guided learning, which make possible learning personalized and independent of places and time, while it continues to monitor the progress in studies and the possibility of control.

- LMS, LCMS (Learning Management System, Learning Content Management System) – Digitizes learning materials can include richer content (see multimedia) than those of paper based; with exploring the relationships among subjects through cross-reference systems, they can assist the interdisciplinary thinking; beyond the handling of learning material contents, LMS systems follow the individual progress and assist the eveluation and support the administration connected with the education and training. Digitized contents make learning materials easily available even in foreign languages.

- Considering the above application areas, it is a desirable objective that we should facilitate the taking of opportunities offered by new info-communication technologies (ICT) and the propagation of their use in the Hungarian education, by functionally joining with the objectives and programmes of eEurope and e-Learning of European Union. To achieve this, we have to

- accelerate the integration of ICT means into the Hungarian education;
- make the use of novel ICT-based applications of the information society and the digital era general in the Hungarian education – on the students', the instructors' and researchers' sides,
- promote the establishment of the possibilities of the best practices and applications and the wide application of these models,
- support the developments of educational methodology based on ICT,
- update the content of the national educators' training.

To achieve the above-mentioned objectives, the modernization of the curriculum and content is inevitable. The digital literacy, which already belongs to the basic competences today, is unquestionably one of the fundamental conditions of a successful life in our times, and considering the economicaly developed countries, this will continue in this way even more in the future. At the same time, the Hungarian school system does not pay proper attention to the attainment of the knowledge of information technology and to the practice of the required skills (several times, because of the lack of objective and personal conditions). In addition to proper learning environments, means, classrooms and prepared teachers, it also means tasks of curriculum control, which have to be revised in certain periods because of the fast development of information technology.

From the launch of the SchoolNet Programme, the propagation of the knowledge of information technology, the improvement of skills necessary for computer use appeared as an important elment in educators' training and further training, but it is of the same importance in the realisation of the Computer Based Teaching and in the training of school system administrators. The SchoolNet Program have specially developed programmes of educators' further training aiming at the attainment of skills and knowledge necessary for the education based on ICT competences, and have had them accredited. In the national market, training and accredited programs appear in increasing number. The integration of the ICT user's competence into the educators' training at a high level is an important task.

Computer Based Learning programs mainly differ from e-Learning courses that they do not mean independent learning unconditionally and exclusively, but they are a completion of the traditional learning process with computers, which can be realised within the frame of lessons. Of course, there are a lot of solutions combining these two: for example, for the computer simulation during lessons, students can obtain additional information through the Internet, even in the course of learning at home. It is also typical that these programs are rather purpose-oriented solutions, and less standard, however new learning materials already strive for compatibility.

In several areas, there is such learning materials at present, too and as a matter of fact, teaching CD-ROMs, which are also available in Hungary, belong to this area. In several areas of knowledge, well designed and, in several cases, standard digital learning materials are available in foreign languages (first of all in English) and in information technology, and there are also special skill-developing solutions, e.g. the MultiCenter, which is of modular design.

Consequently, the propagation of computer based teaching and the support of the special computer applications in the improvement of skills and knowledge transfer processes have to be pressed in the course of learning during lessons and at home. Also, the development of the opportunity and methodology of the use of ICT means in the training as well as its integration into the educators' basic and further training have to be pressed.

The vocational training and higher education of information technology are a special field, which does not train students for general knowledge but positively for the trade of information specialist. The complicated analysis of the labour market the economy, defining

the requirements and volume of information specialists' training, cannot constitute the part of the instructional information technology.

However, it is important to mention that it is worthwhile tranforming a part of the vocational institutions training specialists for different „dying out" trades or those of decreasing importance into vocational training of information technology, since in the future it is in all probability that the demand will increase on these sepecialists who are wanted even now.

Objectives can be the content and methodological development of the vocational training and higher education of information technology in co-operation with businesses of information technology, and the establishment of information specialists' training, which is recognised in the labour market of the EU from the points of view of both quantity and quality.

The training of pupils, students, teachers and instructors having incomplete knowledge of information technology is also an important task. The different user courses and examinations of basic level have an outstanding role for them. Of the international qualifications the ECDL (European Computer Driving Licence) is the most known, and in the Hungarian training system, the training course of computer operator and user in the National Training List corresponds to it.

These trainings are realised on the basis of marketing or within vocational training, and their stop-gap presence is hoped to be temporaly, because the education system will take over this task.

Tasks of Content Development

In general, we can say that the majority of learning materials stored in electronic form do not provide more than the versions in paper form, i.e. they do not take the advantages of multimedia, hypertext as well as the methodology based on ICT.

In the public education, the quantity of learning materials available in electronic form does not reach the 9% of learning materials processed in traditional form, but this part of learning materials is isolatedly used in some institutions only.

In the higher education, the ratio of lecture notes and online courses to the whole learning materials is better than in the public education, but it greatly varies from institution to institution, even from faculty to faculty.

E-Learning framework and learning material editor: one of the most important educational application is the e-Learning, which means learning materials and training courses that are realised through the Internet or a Local Area Network. Learning materials can contain pictures, videofilms, sound recordings and different interactive components (examinations, questionnaires, questions etc.) By now, international standards, which relate to these learning materials (e.g. SCORM), begin to be developed, and during the past years, several international and national projects have started to realise learning materials in digital form.

The authoring tool applications, which are auxiliary means suitable for producing digital learning materials, are something like the well-known word processor or presentation preparation software. Learning materials can be structured and completed with different multimedia elements, and the same learning material can be processed in several ways.

The completed learning materials are "played back" by frameworks (LMS – Learning Management System), and it is these systems that manage the actual courses, participants, and make records on the progress of users, the results of examinations, and display the learning materials of courses for users.

Although the propagation of e-Learning started slower than it was expected, learning materials produced in this way will probably play an important role in the future, first of all, in the field of vocational training and higher education The role of the Ministry of Education is to develope standards relating to electronic learning materials, and support the development of learning materials, and store learning materials, and ensure a proper authors' system and framework, and popularize e-Learning and arrange the related training and further training programs.

E-Learning can make education more effective and enjoyable, and in addition to getting acquainted with the use of computers, it also develops skills, such as independent working and presentation.

In case of development programs, attention should be paid that prepared contents and learning materials should not be system specific, i.e. learning materials have to be suitable for being used by other standard applications as well.

With the aid of e-Learning, the establisment of a Virtual Learning Environment (VLE) also becomes possible, which offers a lot of possibilities in the training. Instructors can download professional and pedagogical information, texts, figures, tables and data at any time and at any place (or at least at a number of places), with which they can flexibly form the content, process and methods of their tranining, and at the same time, they can fit the latest technological and pedagogical results into the traning as quick as possible. Since at present these possibilities are practically available for students as well, their learning becomes more effective and more appropriate for their selected specialization.

The objective conditions (hardware and software) are available in a satisfactory measure for the establishment of VLE even today.

VLE makes possible a crossborder exchange of experience between both students and isntructors. With the expansion of VLE, international co-operations can become more successful and richer, and in spite of the existing hindering facts – e.g. problems caused by incompability -, they can be very useful in the instructional human resource development.

Considering the traditional education forms – and their components -, an e-Learning system has to solve the following problems:

- handling of static content: development and storage of learning materials, lecture notes, auxiliary matters etc.;
- handling of dynamic content:
  a. communication between instructor and student and student and student; real-time (live conversation in textual, audio- or videoconference forms) and not real-time (mailing);
  b. dynamic content connecting with the individual parts of the static content: remarks, questions, answers; expansion and development of the learning material by joint work;
  c. support of activities of practical nature: allocation, solving, evaluation and discussion of questions,
  d. support of control forms: tests, examinations etc.;
- display of static and dynamic content, user interface for manumpulating dynamic parts: separated user interface for instructors and students;
- adminstration: keeping records on courses, classes, instructors and students, control of access.

If we study the enlisted functions from the point of view of technical implementation, we find that the following general tasks should be performed

- storage and manipulation of (static and dynamic) content (internal elements of software);

- display of content, development of user interface (user interface of software);
- assuring remote access for several users, identification of participants, and administration of rights person by person.

Accordingly, in the realisation of an e-Learning system, we can identify more general problems that can also be found in other applications.

The interactivity is also an important issue. Taking the additional opportunities offered by technology is very desirable, since by transforming learning materials into electronic form, we might have reduced the usability (people prefer reading text written on paper to one displayed on the screen), however elements unknown in the traditional methods earlier can be useful:

- synchron and asynchron communications (e-mail, chat, forum, internal message systems, webphone, webvideo);
- reflection and expansion of student-instructor relationship (correct traceability of progress in studies, and from the other direction, the possibility of direct and immediate contact);
- structuring of learning materials (access dependent on given conditions);
- gateway between learning materials (with the aid of lists of words, questions, definitions and others);
- extension of learning materials (remarks and comments of instructors and students; updated and corrected materials);
- questions
    a. tests (choice, fill in the gap, adaptive queations);
    b. team tasks (the members of a given team should jointly solve the question to proceed);
    c. essays;
    d. questions to be submitted;
- statistics (by the analysis of which the structure of learning materials can be improved, and requirement systems can be adapted to students).

The possibilities of support by Internet (and computers) of the traditional education forms are very various and wide. Since in principle any information that can be digitized can be distributed in this way, according to the sense, any educational auxiliary material, additonal material, specialized literature, bibliography, questions etc. can be uploaded to the Internet, and students can download them from there. However these possibilities have some limitations of technical nature (volume, downloading speed), and furthermore the current unsatisfactory level of Internet access and the computer penetration have also to be taken into consideration.

The task to be completed is to develop standards relating to e-Learning learning materials and support the propagation and use of digital learning material developing means and produce and develop electronic learning materials.

The development of a national library of digital learning materials has also started under the Ministry of Education and the SchooNet Program Implementation Office within the framework of the vocational school development program. Its basis is that educational contents are handled as primary units (as learning objects), which can be stored in a central system and can be interlinked according to choice. This is a digital library that stores several thousands of instructional objects, for example pictures, videos, provings, lesson-plans, sequences of questions, maps, in a hierarchic system. In the library of learning materials, seeking can be made according to different points of view, and objects can be organised to

make up learning materials or sequences of courses.

The basis of the library of digital learning materials is an LCMS (Learnig Content Management System), which has been positively prepared for this purpose on the basis of a special specification, and it emphasizes the features serving the descriptions of objects, the so-called metadata.

Owing to its nature of archives, the LCMS is apt to equally support the preparation of instructors, the work during lesson and at home and the independent learning. Before a lesson, instructors can retrieve a vidofilm and some animated historical maps, and during the lesson they can project them for students. If they would like to prepare themselves for a lesson, they can seek guidances and lesson-plans. At home, students can seek additional points of interest and supplementary information on the basis of their instructors' guidance.

The development of the own library of learning materials nears the end, and this year its upload has started thorugh competitions and public procurement.

Significant development has to be carried out in the field of content provision, too, this work is in progress through Internet sites and other interfaces with the support of the Ministry of Education. The most important content provisions existing at present: The own website of the Ministry of Education, the websites of the SchoolNet and the Information Office of Public Education in the public education, the websites of the National Admission Office of Higher Education and the Electronic Information Service in the higher education, and the website of the National Information Infrastructure Development Program in the research and development, and the different content provisions of the Vocational Development Program started in 2003 in the vocational training.

Practically, all the backgound intstitutions of the Ministry of Education have the websites of their own, and other special content provisions can also be found in this sector. Such as the website of the Educators' Further Traininig Institution and that of the National Evaluation and Examination Centre of Public Education.

The relative content variousness has also disadvantages, information does not appear in a unified structure, and the quality of different websites is varying, user should use a lot of different interfaces, and there is no gateway between pieces of information.

With respect for the sovereignty of the individual institutions, we have to strive for that the content provisions by the Ministry of Education should appear in similar structures on the basis of the common principles and solutions, if possible. The navigation among the different sites has to be supported, and a common search interface has to be developed, which can search on contents of several dozens of eductional websites, if required.

In addition to the central content provisions, increasing attention has to be paid to the support of decentralized, regional or local content provisions; e.g. to the regional publications of the SchoolNet website or to the development of a school website composer framework.

The tasks are the development, extension and unification, to the extent that can be realised, of educational content provision and the establishment of the information organisation principles, and the provision of search interfaces and personalised interactive services.

The importance of electronic information gradually increases in every field of the education, so the gradual transformation of traditional libraries into digital ones is an important task, where the players of education can also access to digital information, even if traditional functions are kept.

In addition to the fundamental services, such subcentres can be inportant centres, knowledge bases of innovation taking place in education, and they can contribute to the propagation of information culture with trainings and programs. These centres are also useful in development programs of digital learning materials, which can also include studios making

learning material development of multimedia possible.

Ensuring the Information Technology Infrastructure of Institution

The fundamental network infrastructure of information technology is ensured by the networks of SchoolNet and NIIFI implemented as a part of the PublicNet program, which organises the institutions into regional nodes, and then terminates them in a centre via a nationwide high speed backbone network.

The most important data communication network affecting governmental organisations is the Unified Governmental Backbone Network (UGBN), which is operated by the government and provides highly reliable network access. Its development is complex. However this network does not extend to background institutions, which have quite mixed methods to access to the Internet and other networks.

High speed Internet access of higher education institutions and research institutes is ensured by the backbone network called HBONE, which is operated by the Implementation Office of the National Development Program of Information Infrastructure (NDPII) in the framework of the NDPII on the basis of leased telecommunications lines.

The HBONE is the part of the GEANT network, which interconnects the high speed European research networks developed as a part of the Dante Program of the EU. The HBONE is of very high capacity, and at its fastest sections the speed is 10 GB/sec.

The first objective of the SchoolNet Program started in 1997 was to ensure Internet connection for intermediate education institutions within a closed network, which was based on the exisiting telecommunications infrastructure. By the end of 2005, practically all the elementary schools and other education institutions will have been connected to the network.

Access technologies have also developed a lot, at present there have already been numerous wireless terrestrial and satellite telecommunications systems, so regions without traditional telecommunications infrastructure can also be involved in the development.

Within the framework of the SchoolNet and the Vocational School Programs, a configuration of computer techonolgy laboratories in institutions was provided that interconnected 6 to 7 computers and a server via Local Area Networks, but, in most places, no completed Local Area Network has been realised. Institutions of higher education were granted subsides for building Local Area Networks within the framework of different investments, mainly it is the buildings newly constructed that have complete Local Area Networks. Several higher education institutions spent money on networking from their own financial resources and from funds of competitions.

Due to the National Digital Archives, the SchoolNet Program and as a result of large scale programs of content development and digitizing, a lot of digital contents of public interest have been produced. However the download of these contents of library size through the Internet has not been solved because of the limits of the bandwith and their continual updates.

In EU projects of information technology nature, the increase of access to information in regions and institutions at a disadvantage and the generalization of broadband technologies are fundamental objectives.

Because of the lack of proper infrastructure on the surface of the earth (boradband last miles, content delivery network), creation of content mediating media is reasonable at least temporarily. The unidirectional data broadcasting is a cost-saving solution, which realizes one sort of broadcast technologies. In case of broadcast of large contents, there is no need for backstream, (users do not send information), so it is much more cheaper than the bidirectional VSAT technology. In this case, information gets from a central site to the computers of institutions capable of reception by continuous broadcast via satellites, and these computers

are alway on to be ready to receive and continuously storing data contents and updates arriving through satellites.

We can word tasks, according to which it is important for us to establish a multimedia, presentation and administration means pool in the education, which corresponds to the education policy, to support educational work, on the one hand, and administration and the school management, on the other hand, and at the same time, we have to solve to maintain the level of the meas pool and possibly to outsource its operation and to follow up technology.

The development plans and programs, which started as of 2004 in Hungary and of which we picked up those that concerning this issue only, mean much help in the completion of the tasks.

National Development Plan – e-Learning, ICT

Human Resources Development Operational Programme I. (2004–2006)

In compliance with the priorities set, the objectives of the HR Development Operational Programme of the National Development Plan are as follows:

- EU requirements
- Ensuring transparency
- Transformation of the occupation structure
- Reducing the fragmentation of the training and institutional system
- Reducing the high ratio of drop-outs from the school system
- Enhancing the opportunities of those holding a vocational qualification to find employment in the labour market
- Promoting the relationship between vocational education and the economy

In order to harmonise labour market demand and the competences of those receiving vocational education within the school system, the various actions of the HR Development Operational Programme have set the following targets in the field of vocational education.

The first component of Measure 3.2 of the HR Development Operational Programme – development of the content, methodology and structure of vocational education – ensures the establishment of the new vocational education structure. This task is performed by the National Institute of Vocational Education – in co-operation with 'Apertus' Public Foundation and 'Educatio' Kht. according to the central programmes. Among others, this component includes the elaboration of the method for the modular training system, and the development of the modular document system for two occupation groups, the methods suitable to assess knowledge and competences obtained during prior learning, as well as the digitalisation of syllabi.

Component 2, together with Component 1 of Measure 4.1 – improvement of the infrastructure of education and training – assists in the establishment of RIVTCs and the improvement of their infrastructure through tender programmes and focuses primarily on industrial activities, the service sector and institutions maintained by local governments. The objective of these components is to enhance the efficiency of vocational education and training, by ensuring proper co-ordination of the supply in vocational education, and the harmonised application of state-of-the-art technology meeting 21st century demand in order to promote modern practical knowledge. At the same time, these components are intended to promote the harmonisation of vocational education and training with the regions, areas and the labour market, with the contribution and co-operation of the actors of the economy.

Development Stategy of Vocational Training - e-Learning, ICT

Successful inclusion in the labour market and flexible adaptation to the changing requirements of the economy requires an extensive application of 'lifelong learning' policy. The foundation for skills and competences needed for further learning and the entry in the labour market on the one hand, and being indispensable in everyday life and for being successful in a wider social environment should be laid as early as in elementary education. In respect of the development of basic and key competences within the school system, the following areas should be given priority: foreign language skills, ICT skills, social and life management skills, communication skills.

Enchancing economic competitiveness the most important operative targets and development tasks:

a) More emphasis should be laid on the development of physical abilities and skills, the application of theoretical knowledge in practice, thus increasing motivation of learning and interest in obtaining vocational qualifications.

b) One of the most important objectives of public education and within this, of vocational education within the school system is to lay the foundations for lifelong learning. One of the primary tools for accomplishing this objective is the acquisition of those key competences (writing, reading, calculating, ICT skills), that enable individuals during the whole course of their lives to face the challenges of life requiring adaptation or learning in a wider sense. Naturally, the scope of key competences to be developed is by far not limited to those which directly serve the improvement of individual adaptability.

c) As a step towards modernisation, institutions providing vocational education should be encouraged to apply training methods which may be suitable for the better understanding of, and satisfying the requirements of employers. We should support the wide-spread application of practice-oriented teaching methods, the development and introduction of educational programmes combining practical and theoretical training and directly supporting the students' inclusion in the labour market in the field of both vocational education within the school system and practical training. In order to increase the input of students, new learning-teaching methods and procedures should be applied (project, follow-up on the students' knowledge and skills by a portfolio, various self-assessment methods for the students, etc.)

d) In order to achieve lifelong learning, individuals should be allowed full access to the various levels and forms of vocational education at all stages of their lives according to their abilities and needs.

Increasing mobility and efficiency we focused to the adult education and training too. In order to make the utilisation of e-Learning in adult education widespread, the ICT skills of adults should be enhanced and training should be made attractive to adults. Improving the exploitation of the existing ICT equipment of schools, the installation of new ones, and the replacement of the obsolete ones, could serve as useful tools for upgrading the ICT skills of adults.

– In the forthcoming years, e-Learning based adult education will be promoted by improving the technical conditions for accessing the computer network. Adults joining this form of education can – independently from training venues and time – obtain a syllabus and maintain contacts with the organisers of the training programmes. e-Learning takes advantage of its audio-visual capacities, i.e., the opportunities offered by the multimedia. Fortunately, today both the educational and the business sector – mainly medium-sized and large businesses and multinationals – already have the infrastructure required for the mass application of e-Learning. e-Learning is especially popular with the in-house training of

businesses. If – through planning and content development customised for adults – the variety of programmes offered can be extended within appropriate organisational frameworks, the registration of adults participating in distance learning and e-Learning may be an important element of co-operation, supplemented by services; further, to implement market initiatives, application schemes should also be improved by way of strategic co-operation to accredit the programmes delivered and the supervision and evaluation of processes.

– Further training should be offered for the heads of institutions, and the training and in-service training of specialised teachers and specialised instructors, and the structure of such training should be improved so that they can ensure the implementation of practice-oriented methods and ICT throughout the entire vocational education.

In an economic environment characterised by an unequalled pace of changes in technologies, it is indispensable to promote information and communication technologies to the widest possible extent at all levels and in all forms of education. In the process, special attention should be devoted to small settlements and regions with scattered population. The need to enhance both the content of ICT used for education and the ICT skills of teachers is inevitable. The quality of public education, and within this, vocational education and higher education can be improved by the implementation of comprehensive and uniform assessment systems and quality and institution development systems.

Virtual Learning Environments

According to the recent survey of the European SchoolNet, the Virtual Learning Environments (VLEs) have increasingly been propagated in the education of Europe. It is interesting that two thirds of VLEs, used in the education of Europe at present, is of home-development or of open source, and altogether only one third of these products is commercial ones. „Of the 17 national institutions involved in the survey, in 10 cases the development and localization of VLEs are carried out at a national level. 60 percent of the institutes regarded the introduction of VLEs as of high importance" – says the expert's report, which was prepared at the order of the Ministry of Youth, National Education and Research in France.

In the course of the survey, more than 500 European schools answered the questions of the European SchoolNet between September and December in 2002, and through these questions they wanted to know how Virtual Learning Environments are used in the education on the Continent. 17 national ministries and institutions were also questioned with a view to get to know what part they assigned to Virtual Learning Envronments in the national education policy and plans, and what initiatives they have for training infocommunicaiton and for other e-Learnings.

Accoding to the survey, teachers use VLEs more than students themselves. It is not by chance, since teachers perform administrative tasks as well by such means, as well as they communicate with their colleagues working in the same school and in other ones through these means. In many cases, VLEs are used as a result of international co-operation in projects involving several European countries.

However, the survey shows that VLEs are not able to meet all the expectations yet.

Integrated Learning Form, Distance Learning

During determination of training programs, we have to decide what training form we want to follow in the course of implementation. On making decision, the objective of the program has to be kept in mind, i.e. by what training this objective and this training demand can be implemented with the best results and in the most economical way. This is the basis of the elaboration of a financial plan. We can make a decision in such a way that we will teach or organize the training in accordance with the traditional training forms in its entirety, or we can

decide that we will combine the components of the traditional traning form with those of open or distance learning forms, and finaly we can decide that we will give preference to distance learning. The following comparison, in which we summarize the differences of the traditional and distance learning, can help in decision-making.

Differences Between the Traditional and Distance Learning

The apperarance of distance learning in the learning practice offered a scope and opportunity for the comparison to the traditional learning sytem almost from the first instant. The following table summarizes a possible comparson:

Classical, traditional learning	**Distance learning**
Teachers teach, and their knowledge is determinant in the course of the learning	"Learning materials" teach
Learning takes place in institutions of education, in classrooms	Learning environments vary, learning takes place at different places with realative free timetable
Learning takes place in accordance with a fixed curruculum, which is defined by the institution	It is the student who decides what and when she/he wants to learn
Learning takes place in system of class, year	Students learn in accordance with a timetable of their own, and mainly independently or in changing groups
Media are the parts of the set of means of instructors, teachers	Media are the parts of the students' set of means
Learning is teacher-centric, the program is fixed	Learning programs are affected by students'choice, learning is student-centric

Comparison of the traditional and distance learnings

Of the comparison of the two systems, we can set off the elements that strongly characterize the distance learning form, in particular:

- students have new role, they spend the majority of their learning time with independent work, they have different goals, and they can learn in different learning environments;
- the traditional knowledge transfer, teaching role of educators, instructors and teachers comes to an end, they will have new scope of duties, they have to organise learning, and with new competences, they will have indispensible players of the learning process; A part of their earlier functions will be taken over by the learning materials of new type!
- A new (in several cases, within already existing education institutions) unit comes into being that will organize distance learning;
- new instructional means, methods will come into being;
- the organization of instruction process will be increased and communication will improve.

Essential Requirements of Learning Systems

On the basis of international and our own experience, we have got together the most important points of view, on the basis of which we evaluate these systems. Of course, this list is not complete.

- Suitable for synchron and asynchron communication
- Independent of systems – Web-based
- Compatible with multimedia editors in general use – here I can utilize what I have learnt on developing learning programs of multimedia.
- Its system of means is of modular design – modules can be used several times and they link to each other
- Equally usable for communication with and without centre of teacher
- It can easily be used by both instructors and students
- There is a need for basic computer skills only
- Easy maintenance, flexibility
- Cost-effective
- It includes a set of means for knowledge assessment

Higher education institutions have learning management sysetems that have the usual functions, e.g. independent registration, search in catalogues, approval dependent enrolling, individual timetables, collaboration opportunities, examinations, marking possibilities, registration book of student, instructors, accounts and notices based on working processes. Resource management functions can also be found here, e.g. allocation of classrooms and instructors, conflict management, timetable preparation, recording of enrolling and handling of waiting lists. VLE systems do not need to perform these functions but they have to be able to co-operate closely with these systems.

Study systems also develop continually. Several instructional aids have already been built into the latest versions. In the future, an integrated administrative and instructional framework can develop from these systems.

Essential Requirements of Learning Environments

The functional model of e-Learning systems consists of two main parts:

There is an e-Learning Management System (LMS), which ensures the administrative interface and rights. These are plaform-independent, (solutions of Internet on HTML, XHTML, JAVA, PHP basis)

The other main component is the electronic learning material and object database, in which objects of text, multimedia and other learning materials can be found.

In general, a Learning Content Management System (LCMS) is also attached to the system (but it is not the part of the system). This makes the learning material developers' work easier, and in most cases, it works independently, in off-line mode of operation.

Those that are missing mostly or there are only partial solutions:

- Evaluation and feedback systems.

In general, a MULTIPLE CHOICE question system is built in. This can well be programmed and provide acceptable results when paper knowledge is examined.

- Multifarious question systems are missing, the different practice-oriented exercises can be evaluated with the assistance of instructors only.
- The lack of a simple development environment.

If the learning material development environment is simple, the system is able to do a little, for more complex solutions, it is the learning material developers who have to learn a lot.

- The methodological elaboration of eLearning learning materials is overdue.

Only a few methodological auxiliary materials have been prepared for the application of the totality of the new sysem. In the lack of this, it is difficult to develop well functioning efficient learning materials.

The establisment of a system that is unified but still flexible seems to be almost unachievable. The development and implementation of a system answering every requirement are difficult, even at the level of College of Dunaújváros.

The integration of databases comes up against difficulties from important as well as legal points of view. Higher education institutions already use some system (e.g. NEPTUN or ETR), with which the administration system has to communicate. For this there are attempts and results as well. Recently an interface has been developed for the distance learning system of Coedu to link to the NEPTUN system.

Standardization

Standardization would increase the use of systems of many kinds, in consequence of which the individual systems would have gateways. Analysts expect that if the introduction of some uniform standards is successful, the Web-based area of education can go through an exponential evolution. The enterprises and institutions that intoroduce the standards can give a wider offer for users, with negligible additional costs and consequently their economic efficiency index can significantly improve.

In connection with the implementation of LMS, efforts to unification and standardization came up in a relative early stage. The first organizations of this kind, the AICC – Aviation Industry CBT Committee (http://www.aicc.org/)-, came into being in 1988, and it formulated directives in order to assist the compatibility of CBT (Computer-Based Training) and, later on, WBT (Web-Based Training) systems with CMI (Computer Managed Instruction). In connection with this, the AICC published standard proposals and recommendations, as well as it conducts authentication processes, involving independent test laboratories. In the second half of ’90s, new force was givent to the process, new organizations came into being with similar goals, including ADL (Advanced Distributed Learning – in 1997, http://www.adlnet.org/). In close co-operation with each other, these organisations (and more organisations and institutes of less significance) are working on the development of new standards of LMS systems, taking into consideration the challanges of our age.

The goal is to create a collection of standards that establishes the basis of the compatibility of learning materials, ensuring a unified interface for users, independently of where the given learning material can be found, and whose property it is, and what software was used for its development. The requirements of new systems are as follows: they

- have to use objects that can be resued;
- have to be suitable for accomodating personalized learning materials
- have to be interoperable, i.e. a given learning material should be suitable for the use in another learning environment as well with small modification.

SCORM

The SCORM stands for Sharable Content Object Reference Model, however this standard, recommend for everybody, means much more than simple modeling of sharable content objects. The SCORM is the reference model of web-based learning materials. This is a language that includes the structure inside learning materials, denominations, the place and names of pictures, animations and texts from headers to footers. This standard is the linking chain, or process sequences, if you like, between the technologies to be used and the complete implementations, which will finally be „commercialized".

The SCORM standard is made up of three main parts:

XML specification, which shows the structure of learning materials, or it helps matching of matters server by server.

Run-time environmental specifications, the description of the realation from content to learning material, as well as tracing the evolution of the content.

Specifications of the creation of metadata on the basis of the IEEE standard.

The SCORM standard was developed by the organisation of the ADL Network, further details can be found on the official website of the organisation: www.adlnet.org

At present, this standard is the most popular and accepted by the professional. Almost every VLE system is able to receive matters of SCORM and to handle them as its own.

Comparison of VLE systems

The College of Dunaújváros, and first of all, its Teachers' Training Institution led in the elaboration and introduction of the credit system. At present, several researches are in progress for the development of a new versatile electronic learning system. There was an increasingly urgent need for the introduction of a unified system, which provides a satisfactory solution for the whole College. This was, and it is even now, among the priorities of the College. I would like to present our experience obtained in the course of searching for possible solutions.

We studied four systems completely independent of each other.

1. Asymetrix Librarian, Macromedia Authorware and others

These are the expansions of a good, efficient and widespread Internet environment of multimedia development. They require programming, and in consequence, everything can be found in them, but each learning material has to be programmed separately. The most various, interactive learning materials and question sequences can be developed in this system, however there is a need for an expert and a programmer for the development.

Platform independence is ensured by building the complete program with the aid of XHTML, JAVA or plugins. The use of plugins provides the developer with the most possibilitites, however it results in a slow program execution and it is to be installed.

Their disadvantages are that acquaintance with the system is required even for the learning material development, and learning material developers can develop new material with considerable programming work only.

The price of these sysetems strongly hinders their widespread general use mainly in the branch of instrucion.

2. WebCT

This system is among the VLE systems developed first, which is continously developed and has considerable developer and applier background. There are regular conferences with its users. For the WebCT, several big companies of information technology and education (e.g. Macromedia) have developed interfaces and add-ons, so learning materials developed by means of this system can easily be built in the WebCT environment.

It consists of four modules:

1. learning material organizer and content provider;
2. administration tasks;
3. means assisting communication and learning;
4. appearance editor.

Its disadvantage is the lack of a separate learning material developer. It is the developer who has to prepare the complete material, and this sysetem does not provide a unified interface for the development. It is only the particular developer who can develop any learning material that is developed in this way afterwards.

The basic evaluation system (we can make choice from question types of Multiple Question, and some other Fill-in The Gap and Crossword-making questions) is built in, however it accepts several other platforms, so there is a possibility for almost any kinds of solutions.

In short, it is a well operating system with continuous development and worldwide support. We cannot intervene in the system and adapt it to the requirements of our own. It has a lease fee, which is, unfortunately, rather high. Additionally, it requires a learning material developing system and, for the utilization of its multifarious nature, several utility programs. In Hungary, this system is used by several big companies and by the Centre of Distance Learning of the Eszterházy Károly College, in Eger,

3. SchoolNet Digital Knowledge Base (SDKB)

In the framework of SchoolNet Program, several competitions were lauched, first of all, for the development of learning materials of secondary schools with the support of the top management. Its essential components are learning objects, and modules can be organized from these objects. Its main goal is to establish a considerable database, which consists of the objects of the learning material of secondary school. Teachers can use these components to plan individual lessons, and complete learning material can be made up from these morsels. Its environment of learning material development is very irksome in its present state. Almost a dozen of programs have to be installed if we would like to run the environment of learning material development consisting of templates. These templates have to be filled in, and all the links have to be given. This environment looks like an object-oriented developer system (Visual languages). For the development of individual learning materials, proposals of learning material development are invited for teacher, and these components of learning materials are turned into an adequate format by a team of programmers.

Creation of question sequences is not possible yet; their development is in progress. For the questions completed, there is no feedback towards teachers and learning materials.

I have not found any operating and completed learning material in this system, the start of the complete sysem is expected by September.

In short: The essential components of the system are the learning objecdts filled up with XML-based metadata. The principle is the same as that of the SCORM standard, but compatibility is not marked anywhere. Because of its irksome system of learning material development, there will be a few developers only, however it is hoped that there will be numerous users.

As this system is suitable only for education in secondary schools, the development of a system suitable for higher education has been promised.

4. Coedu Knowledge Net

The Coedu Knowledge Net is an application developed for the transfer and storage of learning materials and expertise. Its use in the framework of educational programs of higher education institutions is of strategic significance, and it can be an important factor in getting advantages on the market of education and training.

For e-Learning courses, on-line and off-line (CD-based) learning materials can be produced, which are made up by designated learning material designers in computer based authoring system integrating Internet-based multimedia means as well, named as “Coeditor” in the Coedu system.

The course editor application is, in fact, an XML editor program. With its use, we can build up a tree-structure, in the „branches” of which we store the appearing data. We can fill up learning material in a defined structure by means of the course editor. We can make up our electronic courses by using the given objects. Authors or operators have nothing to do but put the proper object of learning material in the editor tree and to fill it up with the proper content.

Courses can also be downloaded from servers, so courses can be run on home computers, and there will be no need for downloading in the future.

Lessons are interactive, as soon as questions have been answered, correct answers can immediately be seen, and the sysetem stores the users’ results. These results can be reviewed during listening the course.

In short: This is a Hungarian developed system, the greatest asset of which is that the team of developers is available, and the program can be shaped and upgraded at any time. The upload of users (strong in numbers at the same time) and examination have not been solved yet.

5. Moodle

The Moodle (Modular Object-Oriented Dynamic Learning Environment) is an LMS sysetem of open source code, which realizes the learning environment and allows users to be identified, and it is responsible for the control of the access to learning materials.

The official website of the program is http://www.moodle.org, from where we can download the latest version, language components and we can become acquainted with the wide family of Moodle users.

Its technical features are as follows:

- low resource requirements;
- only a browser program is required on the client side;
- it supports international standads (SCORM, IMS etc.);
- there is a considerable team of developers in the background – a new module or correction of new versions comes out almost from week to week;
- at present this program runs in 3048 registered coopies in 114 countries and it is available in 50 languages.

The greatest advantage of this program over other systems having the same capabilities is that it can easily be adapted to the Hungarian language environment, and this adaptation is already in a very advanced phase, and it is carried out in a rapid pace even today.

The installation of Moodle is very simple and takes place by means of a browser with continuous communication with the installer.

In the system, there are five kinds of users having different rights:

Students – Users the strongest in number, each with an individual profile, which can be managed by both the particular student and the administrator.

Teachers – Teachers can be assigned to courses, who control the process of learning, evaluate the exercises submitted etc.

Authors – Authors of courses can make up new courses, and they can take part in them as teachers.

Administrators – Administrators can do anything and go anywhere on the portal. They can „step into any user's shoe', so this right has to be managed carefully.

Guests – They have very limited rights (they might as well be disabled) and they are users without identification.

The authentication of users raises several problems, such as the great number of users, continuous exchange of students, problem of adaptability to the existing 2 to 3 record systems (electronic study system, library database, mailing system). To solve this problem, we have several possibilities in the system, which make the use very easy.

- There is no authentication: In case of this solution, anybody can freely access to the contents in the system.
- There is only manual account handling. All the details of each user have to be enter manually into the system.
- Authentication on the basis of of e-mail: Students give all the personal data of their own and the system „activates" a new user if she/he visits the URL indicated in the mail sent to the given e-mail address by the system.
- On the basis of external database: The Moodle is able to take over the users' details from an external database. The advantage of the method is that if we have got already a user's datbase properly filled up and well serviced (e.g.: Neptun), we can get users to enter into our framework of e-Learning automatically and in a controlled way.
- Identification on the basis of other network services: It is able to take over data from either a Novel network or servers of Windows or Linux, or mail servers.

The structure of learning materials

In the Moodle system the placement of learning materials begins with the definition of training structure.

The Moodle system makes three categories for the implementation of courses.

1. In the forum format, the role of the Moodle is to keep a „loose" contact with the participants in the training, but the whole content palette can be used.

2. In the thematic format, we can assign independent content modules to the range of subjects existing in the given subject.

3. In the weekly format, we can define content modules broken down to weeks.

During the filling up of learning materials, teachers have the opportunity to prepare learning objects belonging to the given learning material. They can prepare extenal HTML links (to the existing learning materials), or they can upload files or exeternal document links (.pdf, .doc, lxls, .ppt , .pps).

In addition to the learning objects, teachers have several other opportunities:

- Chat: In additions of the opportunities of collaborative exercise solving/discussing, chat can also be used for consultation between teachers and students in a real environment of distance learning.
- Assignment: The assignment creates an interface for the evaluation of one activity. This acitivity can be an off-line (carried out outside the framework) or an uploadable file (homework, paper etc.). It provides an interface for uploading by students or for marking or textual evaluation by teachers.
- Glossary: It allows glossaries, indexes, vocabularies and FAQs to be created.
- Forum: Joint projects can be defined by assingning it to its solution, and evaluation can also be assigned thereto.
- Survey: Surveys are a good feedback opportunity for us in the evaluation of students' performance.
- Lesson: It creates one kind of raising or explication of problems and a form of prove.
- Workshop: It creates one kind of evaluation acitvity by team-mates, to which an extremely large number of options belong. It allows participants to evaluate pojects and model projects of each other in a lot of different ways. Additionally, it co-ordinates the collection and distribution of these evaluations in several ways.
- Quiz: Teachers have the opportunity to define a question database in the Moodle. One of its main characteristics is that test questions can be assigned to several tests, i.e. the defined questions can be reused. The evaluation of the sequences of questions takes place automatically.
- SCORM module: We can easily fill up any standard SCORM package with the SCORM module and integrate them into a course.
- Wiki: It allows us to jointly create documents with the aid of a simple marking language by using a browser. The term „wiki wiki" means „quick as lightning" in Hawaiian, so referring to the speed of the development of editable and upgradeable sites. In general, prior to the approval of modifications, their revision is not carried out, and most wikis are available by anybody or at least by persons having access to wiki servers.

In short:

Instead of investing several millions of HUF, institutions currently getting acquainted with e-Learning can test a framework of open source code free of charge, which can provide the majority of services they need. The websit http://www.opensourcecms.com can be helpful in finding such content management systems, which can help us in choice with its link collection relating to the subject and with its consise evaluation of the individual systems.

We have picked up Moodle system from this site, which is usable and which can be upgraded and meets the essential requirements of an LMS system. Its developers took the WEBCT system as a basis, and they upgraded it and made it simpler. Its main strengths are its simplicity and easy handling. The tasks of admnistrator does not require knowledge of information technology better than average either, and for the sides of teachers and students, the use of Internet has to be familiar with.

Logging covering everything can be mentioned as another advantage. During courses, it stores all the activities of users in details, which can be retrieved through different filters, even in a graphic form.

To overcome language difficulties, the Hungarian localization is continually upgraded, however we can overwrite the vocabulary of the system of our own with the aid of a simple website.

We can also access to the complete documentation (unfortunatelly in English) from the administration side.

The Moodle is an easily installable and operable learning framework that we can be recommend to everybody, who makes her/his first move on the development of an e-Learning system.

Evolvement of Electronic Learning Materials

In addition to frameworks, the other signinficant element of e-Learning solutions is the electronic learning material itself. In many cases, people think that if a learning material or textbook belonging to an existing classroom aining is integrated into a framework, the electronic learning material is already completed. Electronic learning materials have, however, a feature, by which they are more and other than a digitized textbook. This is that no teacher is present on learning, so it is the learning material that, in fact, fulfils the teacher's function. The function of a real teacher is of supporting nature only. Students get learning materials via e-mail, and they can consult with teachers via forums. In the course of development, several important points of view have to be kept in mind in order that a traditional learning material should be an electronic one that can be well learnt.

- Well-constructed training phases. Learning materials present essential information to students and lead them along model exercises, make students solve exercise and examine them.
- Problem-oriented traning. In the course of solving exercises and practices, students meet problems that frequently occur during their everyday work as well.
- Properly elaborated structure. Students clearly comprehend through what steps they obtain the learning material to be learnt.
- Modular design. Due to being divided into several modules, learning materials concerning training allow every student to go through modules that are necessary for her/him, and on the basis of which she/he can solve problems arising during her/him everyday work.
- Theoretical explications. Unambigous and concise wording of notions by textual descriptions, and, if possible, completed with figures on the screen.
- Presentation of processes. Presentation of notion-based operations in details. Exact description and demonstration of steps necessary for the execution of operations by means of animations and simulations.
- Exercises. They have general operation executions practised by making students do exercises. By solving exercises step by step, students learn how they can use the klowledge attained earlier to learn new conceptions. Practical exercises help the participants of e-Learning recognise correlations and draw conclusions by comparing exercises with their

everyday experience. Knowledge acquired in the course of a learning process enable students to confidently and independently use the means learnt in the course of their everyday work.

- Preliminary assessment. The level of students' knowledge relating to the given subject can be assessed at the beginning of eache module. On the basis of answers to questions put up during the preliminary assessment, this asssessment can decide whether a student has to go through the given module.
- Examinations. With the aid of examinations, the level of acquirement of learning materials can be measured.
- Use of multimedia means at an adequate level and in proper quantity. Students's attention can be kept at the desired level, and students of different types (visual and verbal types) can be served.

Aspects of Learning Material Development of eLearning

Pedagogical Aspects:

- Learning materials have to include precise requirements formulated in an adequate and measurable form. These have to be given as lessons.
- Learning materials assigned to the precise requirements and the recommended learning works have to ensure the acquisiton of experience, skills and competence.
- Learning materials have to allow students to learn according to their induvidual timetable and timing.
- Users have to be able to independently work on learning materials with the aid of the learning guidance.
- A user-centric design provides proper navigation within learning materials: it chunks learning materials into modules and modules into lessons.
- The possibility of feedback has to be ensured by self-check questions at the end of lessons and by module closing questions at the end of modules.
- Instructors can analyse and evaluate students' performances. by the services of the framework (LMS).

Psychological Aspects:

- If we prepare a programmed learning material, it has to be of branching type, if possible, as the small extent of steps of linear programs makes adult users nervous.
- It has to have a motivation effect: it has to arouse and maintain interests.
- Integrated navigational possibilities and exercises to be solved have to ensure interactivity.
- Learning materials have to render help in every possible way (solved exercises, learning guidance, optional levels of difficulties etc.).
- Individual lessons have to be suitable for being solved within an hour in order that early tiredness can be avoided.

Content Aspects:

- Learning materials have to be up-to-date and perfect concerning the profession.
- Learning materials have to include multimedia elements and simulations.
- Learning materials do not have to include logical contradictions.
- Learning materials do not have to include sequential errors.

- Learning materials have to be well structured and of modular design (structures of course, module and lesson).
- Each learning material has to include learning objectives, recommended works, summaries of lesson end and self-check questions.
- Let's strive for concise and precise wording.

Editing Aspects:

- Learning materials have to include as much media (text, sound, picture, videofilm and animation) as possible.
- Icons applied in learning materials have to be easily recognisable and of organised arrangement.
- The colours of information and the background of the screen have to be in harmony (a good background highlights the information.)
- Learning materials have to ensure quick orientation by means of built-in navigational possibilities.
- Learning materials have to indicate the visited paths for users with the aid of colours of hyperlinks.
- Display of texts

Let's use the different ways of division (paragraph, emphasizing, enlisting and arranging under headings).

Let's avoid the use of screens longer than ¾ page and with texts only.

- Voice quality

The voice of the narrator has to be audible, texts have to be clear and the speed of speaking has to be acceptable.

The volume has to be even throughout the whole learning material.

Voices have to complete and cannot disturb the transfer of information.

- Use of pictures

Let's use pictures of high quality only.

Let's take care of the aesthetic layout of pictures.

- Hyperlinks and animations

Let's apply live hyperlinks only.

Return to the learning material always has to be simple and unambiguous.

Animations have to be suitable for easy replay.

We need a scenario for the preparation of learning material. With the exception of specific contents, a scenario has to include all the information – descriptions, drafts – that concerns the components of the learning material.

A scenario has to include the followings:

- table of contents of the learning material (titles of lessons and modules as well as their sequence);

- the position of the individual content parts (text-picture-multimedia) and the relationship to each other (how do they link to each other);

- relationship between tests (if any) and the learning material;

- screen designs and descriptions concerning the individual lessons;

- the designation and type of desired interactions;

- the list of links to other content components (e.g. pictures);

- the plan and short description of the planed explanatory figures, illustrations, videoclips and animations;

- the conditions necessary for learning the learning material.

The structure of a lesson or a module

One module cannot be longer than 4 to 5 screen pages, because users are not able to listen to more.

The following parts can belong to the planned individual lessons of learning materials:

- introduction;
- instructions/proposals assisting in learning the particular lesson;
- titles and sub-titles, paragraphs;
- multimedia components: pictures, illustrations, replay of videofilms, sound recordings etc.;
- summarizing questions and exercises for practice in the course of progress;
- at the end of the lesson, a concise summary of the knowledge learnt and the introduction of the next lesson;

It is not advisable to regard a lesson of electronic learning materials as the same as a lesson held in a school or as a private lesson, since these lessons take 45 to 60 minutes, and the work on a lesson on the Internet takes optimum 10 to 20 minutes. It is advisable to desing the structure of a lesson in such a way that it together with its end should constitute a completed whole. A lesson should processe one subject (notion, event) from the point of view of its content.

Pieces of Advice to the Development of Electronic Learning Materials

- The estimated value of the processing time of materials of text-picture, sound and videofilms has to be of 60 to 40%, optimum ratio is 50 to 50%.
- A screen with texts only can be maximum ¾ page.
- Learning material has to take into consideration the requirements of target users (accent, style, activities have to suit them)
- Learning material has to include exact and clear instructions for learning a particular learning material.
- Let’s take the opportunities provided by interactivity, if possible, however it cannot have a purpose in itself ever.
- Your learning materials have to be precise, valid and updated!
- Strive for concise wording with simple sentences.
- The minimum preconditions of learning are to draw, maintain and direct the attention, which allows the reception of information. In case of traning of Intenet, the drawing and maintaning of attention can be achieved with the aid of visual and acoustic techniques and by inserting games, tests and quizzes as well as by applying content processing means differing from each other.

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Comparison of Evaluation Systems

The evaluation system of e-Learning materials is the part of the learning materials, currently available, that is the least developed, so that the learning materials do not reach one of the most important goals, the support of independent learning.

The types of the Computer Based Evaluation are the same as those of the evaluation carried out by using the conventional means.

Accordingly, we can speak about formative, summative, qualifying and diagnostic, standard-based and criterium-based evaluations as well as self-assessment.

The Computer Based Evaluation can also fulfil many kinds of functions on the basis of its placement in time

The formative evaluation is interim, it allows students to evaluate their knowledge and to reveal the imperfection of their knowledge during a course.

The summative evaluation rates the work done by students into mark categories at the end of a course. The summative evaluation is always of qualifying character.

In respect of its goal, the Computer Based Evaluation can fulfil many kinds of functions.

The diagnostic evaluation serves to assess the students' preliminary knowledge before the beginning of a course in order that the course can be adapted to a particular student if there is any imperfectness of knowledge.

The qualifiying evaluation means the rating of the students' performance into mark categories. It can also be applied during and at the end of a course. The mark given is taken into account in the judgement of the work done by students. The students' attention has to be drawn to the meaurement of performance in advance.

In the Computer Based Evaluation the most difficult task is to make up the questions themselves and to word them, since the examination and the evaluation of results are only a technical question. The task of instructors is to make up a good sequence of questions, because an all-knowing test system is worth nothing if it is not filled up with proper content.

Advantages and Disadvantages of Computer Based Evaluation

It is reasonable to use Computer Based Evaluation for e-Learning material, together with all its advantages and limits.

Advantages:

Tests written well are objective, and their scoring does not depend on the subjective judgement of the person carrying out the evaluation.

Tests can easily and quickly be corrected.

Tests can measure several kinds of performance of students.

Different media can be integrated in tests.

Online performance measurements ensure fast feedback.

Guidance can be integrated into test questions.

On the basis of test results further learning activities can be ensured.

By means of question banks random selection of questions can be attained.

Test results can easily be handled and stored in databases.

Disadvantages:

Due to the frequent use of multiple-choice tests, it is linked with the measurement of knowledge rather than that of understanding.

The preparation of good test sheets requires paper knowledge and experience, so in the beginning it is a time consuming task.

The realisation of a Computer Based Evaluation system is costly.

High attention to hardware and software is required in order that breakdown can be avoided during examination.

In case of web-based systems, safety problems can arise.

Students need skills and experience in the operation of computers.

There is a need for organisation of high level for the staff taking part in the evaluation (instructors, assistants, computer experts).

The most important methodological expectations of evaluation systems:

- A sequence of checking questions should be at the end of each content unit – first of all to check paper knowledge.
- There should be questions to be answered at the end of each content unit – to measure practical knowledge.
- At the end of every main content unit, there should be an opportunity for self-assessment – to provide students and instructors with feedback of the level of knowledge.
- Answers and feedbacks should be given to every question. - if I do not know the answer, it gives references where it can be found.
- On the basis of questions there should be a possibility to go on to the next step or step back under control - if I know the leaning material well, I can make a faster progress, or if I do not know it, the program prevents me from stepping forward.

Types of Questions

- Multiple Choice Question. The name comes from the type of the question, e.g. the correct answer should be picked out from more than two ones.
- True-False Question. The correct answer can be picked out from two ones. The answer is correct or incorrect.
- Fill in the gap, Completion or Text/Number Entry Question. Students have to complete a sentence by writing in or picking out the missing elements (a word or a number).
- Sequencing Question. Students have to arrange the enlisted answers in correct sequence. There is a single correct sequence only.
- Relation Analysis or Assertion Reason Question. Students are given a compound sentence. The question is to decide which of the clauses is true, and what is the relation between the two clauses. They have to pick out the single correct solution from the enlisted standard possible ones
- Essay Question. Students have to give the answer with text by filling in the appropriate text box. This question corresponds to the conventional question type of essay. The correction of these questions cannot be computerized.
- Fill in the Table Question. Students have to fill in a table, certain cells of which are blank. Filling in of these cells can be made on the basis of the content of neighbouring cells.

- Error Correction Question. Students have to identify errors in the text displayed on the screen, and correct them by filling in the appropriate text box. This question type is used mainly in language teaching.
- Matching Question. Students have to find and mark the matching elements enlisted in two separated columns.

Recommendations for questions preparation

Questions have to represent the expectations (learning outcomes) defined in the system of requirements.

They have to cover the most significant parts of the examination material. Of numerical data, only the ones in the most frequent use have to be applied.

They can be neither too easy nor too difficult, they have to adapt to the students' knowledge reasonably expectable.

Let'a chose question types corresponding to the learning material.

Let's put aside textbooks and manuals, if possible, when we prepare questions.

The wording has to be concise, precise and unambiguously.

Examination sheets have to be easily understandable.

If our goal is that students should learn facts, definitions and correlations, questions have to measure the students' ability to recall facts, definitions and correlations. If we intend to help them think in a correct way by using the learnt facts, definitions and correlations, test questions have to measure the students' ability to apply facts and principles in the course of solving problems.

Questions examining memory performances differ in content from ones measuring application. The header of questions measuring applications consists of two components: data unknow by students and questions to be answered. If data are known, the question will measure the memory performance.

Distractors based on typical failure by made tudents or on misconception are very effective. The simplest way to collect them is to use open questions requiring short answers in the course of formative evaluation. Of them we can make the most of the most frequent ones as distractors of multiple choice questions.

In general, statements correct for themselves, which do not give any answer to the questions raised, are very effecient distractors.

Do not use distractors that slightly differs from the correct answers only. This misleads students, who, in fact, know the correct answer (and do not make a guess only).

In case of questions having several correct answers, in the header of the quesition we have to refer to that there are several possible answers. We can also give the exact number of correct answers.

In case of certain CAA systems, there is a possibilty for students to pick out the correct answer from a drop-down menu. In this case this question type can be used for qualifiying evaluations.

On the basis of general experience, it is practical to use choice questions on examinations. The correction of these questions is automatic and no errors of mistyping occurs.

Particular Realised Systems

Let’s see some particular evaluation systems applied.

Coedu Knowledge Net

Coedu Knowledge Net is a complex VLE system developed in Hungary, to which a learning material developer and a question editor also belong.

Applicable question types:

- Choice question
  - Simple choice
  - Multiple choice
- True-false question
- Relation analysis question
- Fill in the gap question (In case of fill in the questions, texts have to be typed in, selection from a drop-down menu is not possible. This inevitably leads to mistyping.
- Essay question
- Sequencing question
- Fill in the table question
- Error correction question

At the end of each course, a sequence of questions can be found. Additionally, so-called stop tests can also be created. Students have to pass these tests in order that they can start to study the next learning material.

The Functions of the Quiz Faber System

Quiz Faber is suitable for preparing multimedia tests, and it is a freeware suite. Tests can be displayed as HTML documents by the aid of a WWW browser program. The test editor program is an application running under Windows

It is capable of handling the following question types:

Multiple choice questions with one or more correct answers;

True-false question;

Essay question;

Fill in the gap question;

Matching question.

In case of filling in the gap questions there is also a possibility for choice from predefined key words enlisted in a drop-down menu. This makes an errorless answer entry possible.

The person preparing tests can comment on every answer. Students can see these comments on the HTML page if they have chosen the pertinent answer. After the completion of the test a mark calculated on the basis of the number of point of questions can be displayed.

After the completion of the test an evaluation page can be displayed with the number of the correct and incorrect answers and the mark can also be displayed. The result of the test can be sent to a given e-mail address or it can be stored in a preset web server as well.

The Possibilities of Moodle

Instructors have the possibility to define a question database in the Moodle. One of its main characteristics is that test questions can be assigned to several tests, i.e. the defined questions can be reused. The evaluation of the sequence of questions takes place automatically. The types of the questions are as follows:

Choice question;

Short answer in text (a word or a term)

True-false question

Matching question;

Fill in the gap question

Numeric question (e.g.: giving allowable values in a range);

Descriptive modules can be put in.

The sequences of questions are randomly selected from the given questions (to which medium elements can be linked). There is a possibility to set whether the computer gives the correct answer during or at the end of the test or whether correction can be made. Detailed statistics of the test results is available for instructors and students.

The developers of the Moodle have prepared several supplements to the evaluation system and these can be downloaded from the web site of Moodle.

Finally, an in-house developed application

The multiple-choice method, which was developed from different written examination forms, is, possibly, the mostly usable evaluation system and it is increasingly coming in general international use, too. It is also an important fact that an exact key to correction can be given to this question system. With the aid of this key we can easily teach the computer how the given sequence of questions should correctly be evaluated, so that the whole process of examination can be automated.

With taking account of all these, we have developed an application, which provides possibility to utilise the multiple-choice system in every aspect.

The majority of applications available on the Internet do not utilise the possibilities of the multiple-choice question types, and putting questions is limited to the application of a question type.

Realised question types:

Simple fill in the gap question

This is the simplest and mostly used question type, in which five possible answers belong to an incomplete statement or a question.

Four kinds of association question

It is excellently suitable for measuring discriminating, judging as well as comparing skills.

Five kinds of association question

It is excellently suitable for the exact parting of particular notions and phenomena belonging to certain trade categories and, at the same time, for the examination of expertise and discriminating and associating skills existing in this field.

Relation analysis question

It can be used to measure the skills of logic as well as the acquired knowledge of students.

Quantitative comparison question

It makes possible to neglect to memorize numerical data. For absolute quantities, on the one hand, it contains comparisons of order of magnitude, and on the other hand, it makes possible the comparison of certain phenomena in respect of quantity.

Multiple filling in the gap question

In the course of answering questions, a choice has to be made from four possible answers, among which – of course, in different grouping – there can be correct and incorrect answers.

Variational interrelation question

A question type that is suitable for proving the identification of interrelations between phenomena.

The following question types do not belong to the multiple choice question system. These basic types in question arose as instructors' demand in the course of the trial run of the program.

Text completion

Essay

The function and general characteristics of the program:

We have developed the program in such a way that it should allow the simplest but versatile use. Its important features are as follows:

It is of Web-based program of multiple users.

Anybody can access it from anywhere.

It can be built in learning materials of distance learning already existing.

In this way, a student can immediately check at what level she/he succeeded in learning the learning material just after the study of a particular part of the learning material.

It does not require knowledge of information technology at a high level, and neither the person filling in the test nor the person preparing the questions needs to install the program previously.

Questions are gathered at a central site, and they can be reused, so that test sequences in any number can be created.

The server programs protect our database against unauthorised visitors with the aid of allocation and monitoring of proper rights.

The program can simultaneously be used by several users, and everybody can protect her/his sequences of questions wiht the aid of a username and a password. One server might serve even a complete institution. The person uploading questions can decide when she/he makes the sequences of questions public or disables their filling in. We can log in the system from home, school and anywhere and any time without installation of any program on our computer. For example, if we want to prepare our sequence of questions at home (only an Internet access is required), it can immediately be displayed at any point of the Internet just after the completion of the work.

Evaluation of tests

The most important elements of the test programs is the evaluation part, which gives the results achieved, on the one hand, and shows the correct answers, on the other hand.

After the completion of tests, the program evaluates the answers given. It displays the total number of questions to be answered, and how many were correct of them, and the percentage of the performance and finally the mark it proposes.

We have possibility to ask for a detailed evaluation, where questions and answers given are displayed. Next to every answer, there is a marking indicating whether the answer given was correct, and if not, the correct answer is displayed. The comparison of these can give us a detailed picture on our knowledge.

If, on editing a sequence of questions, we mark that whether the sequence of questions requires logging in and the program should store the results. After logging in, the editor of a sequence of questions has the opportunity to look at the results of the filling in and the data of the person having filled in the test and the date of filling in at the functions of the sequence of questions filled in with the same fullness of details.

In short:

From the completed question bank, we can easily make up sequences of questions, and we can look at and test them. If we do not want to start the completed test from the menu of sequence of questions view after the start of the program, but we would like to attach it to a learning material of distance learning, we have the possibility to do so. It is enough for us to insert a link into the document, and users can fill in the given test by clicking on this link. We might get the data of the person having filled the test and her/his results via e-mail as well, if we set this option in the editor of the sequence of questions.

Summary

As a summary we can say that there is no perfect sysem. The advantage of home developed systems is that everybody can adopt it to her/his requirements, but as an ultimate solution there should be a unified system well usable at the level of the whole higher education. This idea is also included in the information technology strategy developed in the Ministry of Education. In their opinion, a unified learning environment can evolve, which would include learning materials, the 80% of which are of centrally developed and 20% of which are home developed. Central record of students and credits will reach completion. A central VLE system would be an efficient instrument for this, however there is no example for this in the world. Genarally, every more considerable education institution applies a system developed on the basis of their conceptions, and serious effors are made towards compatibility.

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Elektronikus oktatási anyagok. www.duf.hu/tanarkepzo/modulok:
TA-009 Oktatástechnológia
TA-011 Gépész Módszertan
TA-017 Informatika Módszertan I.
TA-042 Oktatás Minőségbiztosítása
TA-303 Pedagógiai értékelés

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Liodakis George

TEI of Crete

Experience gained using asynchronous tele-teaching facilities at TEI of Crete

ABSTRACT

The emergence of the knowledge society signifies a new era for education. The rapid evolution of Information and Communication Technologies (ICT) provides the enabling technological tools for facilitating the implementation of the new paradigm in education referred to as e-learning. Our study was carried out during a nine-month period of time and presents an empirical analysis of teacher's and student's perceptions about the use of asynchronous tele-teaching at an Technological Educational Institute (TEI) of Crete which is an institution of tertiary education. Our basic methodological tools are the interviews and the questionnaires addressed to the users of asynchronous education at TEI of Crete. The platform studied in our research is a typical asynchronous tele-teaching platform, which supports synchronous ways of communication. Among the first results, a distinguished role seems to play the pedagogical framework in a distant learning environment. Teachers and students of our research argue that asynchronous tele-teaching can be mainly used as additional piece of the conventional educational process. They also agree that a good learning environment requires opportunities for interaction and feedback and an online learning system can be basically seen as a typical information system. Platform's users consider that they are more active and productive in the asynchronous e-teaching environment, although they have not fully exploited it yet.

Introduction

Our society is characterized as the information and the knowledge-based society (Turkle, 1997, Castells, 2002). In this society, schools face challenges to bring up students with intellectual creativity and critical thinking ability (Turkle, 1997). In order to understand and adjust to the rapid, deeply affecting changes in society every person should have access to education. Information and Communication Technologies (ICT) are seen by many commentators as prompting fundamental structural changes in the educational process providing new possibilities for the creation of innovative effective environments of teaching and learning by re-defining the educational frameworks and deploying new learning facilities. The use of ICT is becoming a part of everyday life in schools. In the process of collecting, analyzing and processing information and sharing ideas with others, ICT serve as essential enabling tools (Kalogiannakis, 2004).

One way in which ICT has been expected to improve school is by changing methods of teaching. The permeation of ICT in the sensitive area of education tends to create a totally different learning environment, having as one of its components the procedure of Open and Distance Learning (ODL) creating greater flexibility in place and time. The participants in a distant learning system should be able to exchange ideas, to argumentate on their actions or on their point of view, to send and receive messages or materials.

However, as educational institutions attempt to rapidly meet the demand for distant learning, the quality of online experience varies across, and often within, these institutions. Many online courses still focus on presenting content online with minimal opportunity for

interactions and active learning. Distant learning has the potential to provide students with access to up-to-date information anywhere and any time and to promote active and independent learning. Modern students should adapt themselves to the new educational requirements and the ability to collect, develop, exchange, store and manage information from various and dispersed data, is essential (Turkle, 1997). Generally, ODL demands extra designing efforts for education process and electronic materials.

Framework

Technology is increasingly used not just to overcome isolation but to provide convenience to people who might otherwise be considered isolated. This is an interesting change as it alters the relationship between teacher and learner (Pierrakeas & Koutsonikos, 2003). Here are four of the most frequent reasons given for using ICT, although there are probably many more (Kalogiannakis, 2004): (i) to improve access to education and training, (ii) to improve the quality of learning, (iii) to reduce the costs of education, (iv) to improve the cost-effectiveness of education.

Nowadays educators must abandon teaching methods based on rote learning and behaviorism. Instead teachers should adopt more active and constructivist approaches using ICT. The complexities of ICT used in class challenge students and tutors who must be careful and avoid confusion between “easy access to resources” and “learning process” (Vassilakis et al., 2005).

A general goal of distance education is to create environments that both learners and instructors seek to promote new collaboration framework, allowing students to learn from the course materials, the instructor and each other (Vassilakis et al., 2005). There are (a) synchronous collaboration environments which require students and instructors to be consistently connected and in constant attendance, (b) asynchronous collaboration environments which allow parties to communicate in a disconnected fashion and eradicate barriers of time and/or place and (c) mixed systems that support both synchronous and asynchronous communication. In the case of asynchronous communication, the delay occurred allows time for reflection in interaction. Most of the online education programs and supporting technologies are only supporting classroom model and not taking advantage of enormous opportunity presented by the pedagogical framework of supporting individual learning that can revolutionize the e-learning paradigm (Sonwalkar, 2005).

The various platforms of tele-education, as those of asynchronous tele-teaching, can be used for the development of environments of remotely teaching and/or as additional tool of the conventional educational process. In distant learning environments students must be at the center of their own training (student-based learning) and these systems must be well designed to facilitate learning process. Additionally ODL has the potential to provide students with access to up-to-date any information, anywhere and anytime, promoting active and independent learning.

Earlier researches at TEI of Crete (Athanasaki-Michailidou et al, 2001) showed that students already holding a degree were not always ready to use new distant learning technologies and exploit their full capabilities. However, it is encouraging that these preliminary results indicate that they not only accept but also even prefer distant learning to conventional studies (Athanasaki-Michailidou et al, 2001). The platform studied in our research is a typical asynchronous tele-teaching platform, which supports synchronous ways of communication and authorised users can access it at ***http://eclass.cs.teiher.gr*** web address (Liodakis et al, 2005). The particular platform we study consists of a multilevel organization structure and gives to the students the opportunity to organize their study using the educational material presented through the network. Additionally they have the ability to

interact synchronous (chatting) or asynchronous (e-mail/forums) with the tutor and other colleagues.

Methodology

Our study was carried out during a nine-month period of time (October 2004 to June 2005) and presents an empirical analysis of teacher's and student's perceptions of distant learning as main or as complementary tool of a class. Our basic methodological tools are the interviews and the questionnaires that were addressed to the users of asynchronous education at TEI of Crete. Our analysis was based on qualitative and quantitative methods (Blanchet et al, 2005, Miles & Huberman, 2003). In this study we try to identify: (a) teachers and students' attitudes in a distant learning environment in comparison with their experiences in conventional learning environments, (b) their emerging new roles, (c) the advantages and disadvantages of distant learning at an institution of tertiary education and (d) the proposals of teachers and students for further exploitation of asynchronous education at TEI of Crete.

Our study was made up of 12 semi-directed interviews with students and teachers and 129 questionnaires for students and 17 for teachers. At first, we conducted interviews with students in order to generate items for the questionnaires (Miles & Huberman, 2003). Furthermore, we where guided to a first version of the questionnaire consisting of closed-form items and open-response questions. The structure of our questionnaire covers the following three main categories of questions for the platform of TEI of Crete: (a) exploitation issues of the e-learning platform, (b) assessment of the e-learning platform services and (c) prospects and proposals. The closed-form items of the questionnaire were rated using a Likert scale that ranged from 1 to 5 and contained teacher's and student's demographic items regarding sex, year in the educational program and familiarization with ICT.

Results

Among the first results of our research, a distinguished role seems to play the perceptions of students and teachers about the use of asynchronous tele-teaching at an institution of tertiary education. They argue that platforms of asynchronous tele-teaching can be mainly used as additional piece of the conventional educational process. Students and teachers that participate in our research seem to agree that a good learning environment requires opportunities for interaction and feedback, although an online learning system can be basically seen as a typical information system. Platform's users consider that they are more active and productive in the asynchronous e-teaching environment and the relation student-professor seems to change. Teachers and students appear to be often more active, although they have not fully exploited it yet.

Our analysis results show that a significant factor for the configuration of the interactions between students is the fact that they work in small groups to do their projects. One of the most important of the four types of relations (collaboration, socialization, exchange of technical advice and emotional support) is proved to be the collaboration relation. They also argue that face-to-face communication has a significant impact on the development of the socialization and emotional support of the students.

Our analysis shows that the frequency of platform use is not encouraging, as there the percentage of rare use is rather big (Figure 1), maybe, because the exploitation of the platform is fairly new in TEI of Crete. On the other hand according to students there is a satisfactory communication level between student-tutor (Figure 2).

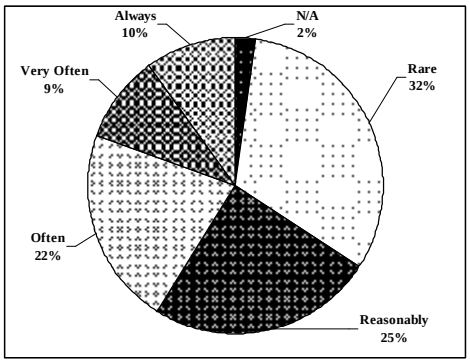

Figure 1. Frequency of platform use according to students

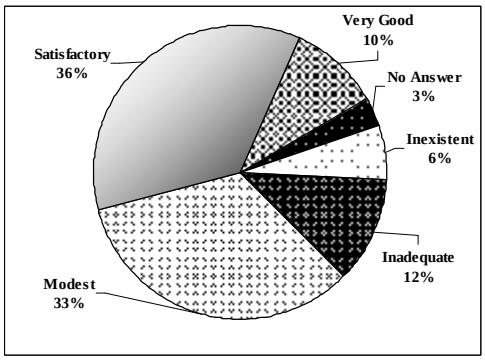

Figure 2. Communication with tutors according to students

The "student-users" argue that they are more stimulated when they have to attend a course through the e-class platform (Figure 3); it may be due to the fact that ICT always attract young population (Turkle, 1997, Castells, 2002). Students also believe that the instructor is more active in an asynchronous learning environment, but they do not seem to share this tendency for themselves (Figure 4).

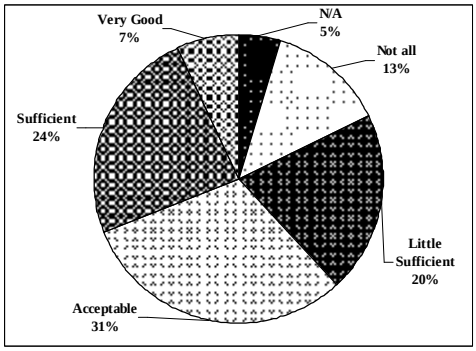

Figure 3. Stimulated student interest with platform use

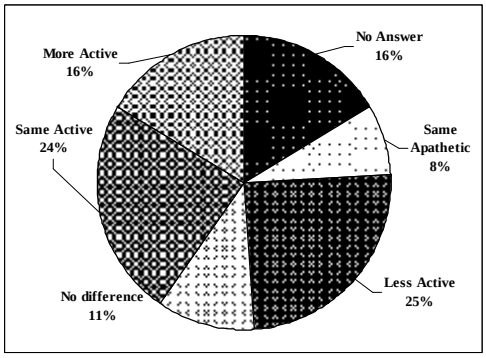

Figure 4. Students attitude with platform use

The majority of students regard the platform's services as a support and complementary tool for the conventional way of education (Figure 5). Their beliefs, however, when considering the platform's services to be used as the basic educational tool, are strongly divergent (Figure 6).

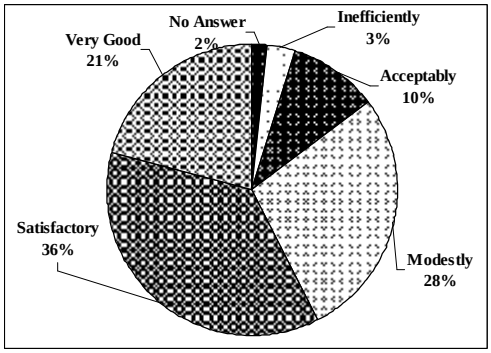

Figure 5. Platform as supplementary tool according to students

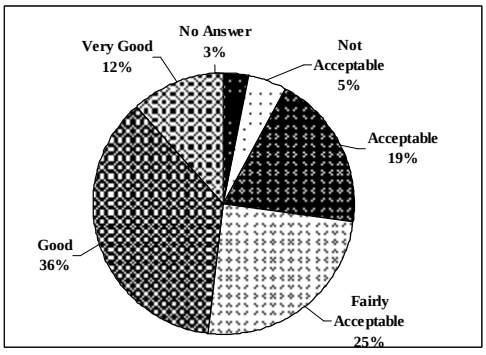

Figure 6. Platform as basic tool according to students

Most teachers of our research offer more than one course through the platform and they use it very often. However, they do not consider the system as the fundamental teaching tool (Figure 7). They rather think that such tools are useful as subsidiary means of teaching (Figure 8).

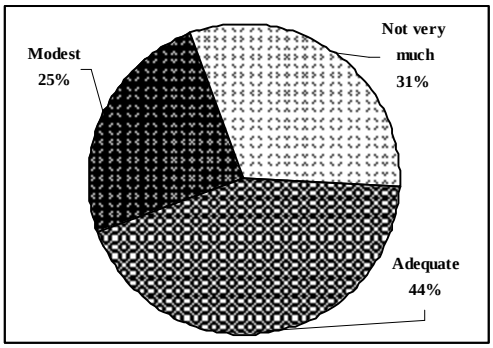

Figure 7. Platform as supplementary tool according to students

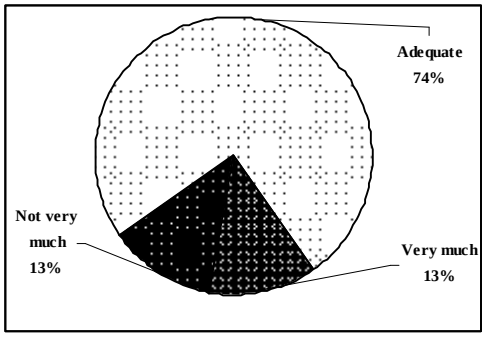

Figure 8. Platform as basic tool according to students

A distinguished role seems to play the pedagogic framework for the effective exploitation of ICT in an institution of tertiary education. Moreover, in order to design adaptive learning systems a huge set of rules is required, since dependencies between educational characteristics of learning objects and learners are rather complex. We argue that further research is required to understand the roles and the demands of teachers in order to find out the conditions in which students are less dependent on teachers. In parallel, with use of ODL environments we ought to study more deeply the complex pedagogical issues involved in the use of ICT.

Discussion

In our study we find out that access to distant resources is rapidly becoming commonplace but the understanding of how to make good use of these resources, is only slowly emerging. Platform's users consider that they are more active and productive in the asynchronous e-teaching environment, although they have not fully exploited it yet (Kalogiannakis et al., 2005, Vassilakis et al., 2005). Some negative implications of distant learning are mentioned by the users of our system arguing that is still not very widely spread and known at TEI of Crete and the possible loss of social contact and isolation of a distant learning student. Although, nobody questions the introduction and use of ICT in education teachers still worry, as far as the limited use of integration of distant learning is concerned. The current research at TEI of Crete indicates that this picture has been started to changing. Distant learning environments can be seen as tools for supporting new interaction patterns and activities.

We consider that the future of distant learning is not in providing static content that just provide information, but lies in the power of customizing the content in order to match the learning needs of each individual learner. It is time to build the next generation adaptive learning systems. From this perspective the ideal educational system might well be an amalgam of traditional schooling and distant learning in which the learners' needs and abilities can be matched to the best available educational practices.

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APPENDIX

Anton van den Brink - Paul Dirckx

Fontys PTH

Results matrices depth test for VLE's

Name VLE: N@tschool, WebCT, Moodle, Blackboard v6

This document reflects the results which are obtained from the questionnaires filled out by the users of several VLE's. The document contains questions for several target groups. That's the reason why some of the questions appear more than once.

The following target groups will be distinguished:

- course developer/ curriculum developer
- material developer
- teacher/coach
- student
- administrator
- system manager/ application administrator

In the evaluation list for VLE's there is also a separation between pedagogical didactical criteria and criteria concerning the infrastructure.

Remarks:

- Answers have been based in certain cases on opinions/ perceptions of persons and could be subject to personal objectives and motivations.
- Updates and upgrades of VLEs will appear regularly, so the capabilities and ease of use will improve continuously.
- Answers and remarks in this document could not always be verified and dealt with the opinions of individual specialists.

Pedagogical didactical criteria: variation in supply and interaction

Questions of importance for the role of course developer/curriculum developer

		ELO	Yes/No or --, -, +, ++	Remarks
1.	Does the tele-learning platform offer direct access to the subject matter units material, assignments, etc. In other words not via courses or modules?	N@tschool	Yes	
		WebCT	No	
		Moodle	No	A course is the basis concept of Moodle. For most part all content is within courses.
		Blackboard v6	No	Blackboard requires content to be set up in the form of modules.
	Subject matter planning is easy to apply and to adjust? ++ outstanding, + good – asks a lot of effort, -- not executable without additional means.	N@tschool	+	
		WebCT	-	
		Moodle	++	
		Blackboard v6	++	
	Additional material is easy to add. ++ outstanding, + good – asks a lot of effort, -- not executable without additional means.	N@tschool	++	
		WebCT	+	Zip file import
		Moodle	++	
		Blackboard v6	++	Blackboard supports the upload of zipped files which can be unpacked into a module space. It also allows for the import of ready made Blackboard courses (in the form of course cartridges)
	To produce individual or collective assignments, based on competence oriented learning, PGO, projects or cases are possible. ++ outstanding, + good – asks a lot of effort, -- not possible without additional means	N@tschool	++	
		WebCT	-	
		Moodle	++	Moodle doesn't have a project management tool per se, but the workshop tool implements a certain popular workflow and the wiki tool is a general purpose collaborative hypertext environment.
		Blackboard v6	++	Individual and collective assignments can be set up using Blackboard. Individual work can be submitted via the digital drop box. Support for collective assignments is not implemented in the software design, but would need to be the result of pedagogic planning.

Questions of importance for the role of material developer

		ELO	Yes/No or --, -, +, ++	Remarks
2.	Subject matter is easy to apply, inclusive tests and assignments.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Presentation of the subject matter is possible with text, sound, graphics, video ++ everything, + less, - not	N@tschool	++	
		WebCT	++	
		Moodle	+	Basically, Moodle can deliver all web-content including rich media files; however the integration to the platform can be quite superficial. There is no support for streaming.
		Blackboard v6	++	Blackboard supports all major media formats, it does not support media streaming.
	The platform contains a number of tools to place and to organise text and assignments.			
	Compulsory present	N@tschool	Yes	
		WebCT	Yes	
		Moodle	No	There's a set of tools the teacher can choose from. Moodle starts with a blank page that can be customized according to the teacher's preferences.
		Blackboard v6	Yes	
	Or optional usable	N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	No	
	Internal tools	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	No	Blackboard has few possibilities to link with external tools
	Or external (changeable) tools	N@tschool	No	
		WebCT	Yes	It's possible to link web based tools.
		Moodle	Yes	
		Blackboard v6	Yes	

	Entourage is easy to operate	N@tschool	Yes	
		WebCT	Yes	A somewhat complex user interface but will do.
		Moodle	Yes	Some of the tools are complex.
		Blackboard v6	Yes	
	Or extremely complex	N@tschool	No	
		WebCT	No	Complex, but not extremely.
		Moodle	No	
		Blackboard v6	No	
	The platform contains a number of tools to enter test questions:	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Blackb. has a range of tools for text based test questions.
	Compulsory present	N@tschool	Yes	
		WebCT	Yes	There are two.
		Moodle	No	There's a set of tools the teacher can choose from.
		Blackboard v6	Yes	
	Or optional usable	N@tschool	No	
		WebCT	Yes	Requires innovativeness.
		Moodle	Yes	
		Blackboard v6	No	All tests are set at the discretion of the tutor.
	Internal tools	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	The blackboard tools are internal to the system.

	Or external (changeable) tools	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Blackboard does support the loading of material in SCORM format, although this does not necessarily lead to the creation of test format data.
	Entourage is easy to operate	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	The Quiz and Assignment tools are very usable. Other tools that can be used for testing may be difficult to use.
		Blackboard v6	Yes	
	Or extremely complex	N@tschool	No	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	No	
	The platform contains a programme item that makes self-assessment possible. ++ outstanding -- not present	N@tschool	++	
		WebCT	++	
		Moodle	++	
		Blackboard v6	++	Tests can be set so that users see the results and use these for formative purposes, they can also be set to be taken on multiple occasions.
	The platform contains the possibility to include test questions in a pool, which can be demanded in difference ways. ++ yes, + just one pool, - no, just questionnaires	N@tschool	++	
		WebCT	++	
		Moodle	++	
		Blackboard v6	++	Questions can be created in a pool with random selections being made for the tests from this

	Existing electronic learning materials, e.g. on CD, can be started from the platform. ++ the platform is testing the working environment on the presence of the programmes needed + there is a facility to make it evident to the platform what the working situation of the student is. +/- Only a link can be made by putting a hyperlink in HTML. - it is not possible at all, because the platform prevents it.	N@tschool	++	
		WebCT	++	
		Moodle	+/-	Moodle is a server/thin client architecture. If the existing material can be placed on the server and delivered over HTTP/1.1 it can be started. In practice hyperlinking would be normal way.
		Blackboard v6	+/-	Blackboard can handle links to content on local drives, so it is possible to perform this action (although there are other technical difficulties, such as consistency in naming of drives).
	The material developer is able to use external test software, with or without exchanging data. ++ both, + just getting started, - takes a lot of effort, -- not possible	N@tschool	++	
		WebCT	++	
		Moodle	-	There is no interface for it so implementing such setup would require specialist knowledge, but probably not that much work.
		Blackboard v6	-	

Questions of importance for the role of teacher/coach

		ELO	Yes/No or --, -, +, ++	Remarks
3.	The existing subject matter can easily be extended with existing material that the teacher made by using his own means. ++ outstanding, + good, - costs a lot of work, -- not possible	N@tschool	++	
		WebCT	++	This is even a better option. The tools for creating material within the platform are quite poor.
		Moodle	++	
		Blackboard v6	++	Teachers can add new content at any time
	The addition of individual or groups minded assignments are possible. ++ outstanding, + good, - costs a lot of effort, -- not possible without additional means.	N@tschool	++	
		WebCT	+	The features are good but the usability could be better. The students complain about difficulties concerning this.
		Moodle	++	
		Blackboard v6	+	There is some limited support for group assignments, it is not fully functional however.
	The teacher can assign additional existing subject matter, assignments or instructions to subgroups.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	The teacher can make subgroups for separate approach. ++ independent, + via administrator, - not	N@tschool	++	
		WebCT	++	
		Moodle	+	Teacher can independently make subgroups but this is not a very powerful tool at the moment.
		Blackboard v6	+	Groups within the class list of a module can be created

	The teacher can make a review of the results and the disciplines made. ++ outstanding, + good, - costs a lot of effort, -- not without the administrator	N@tschool	++	
		WebCT	++	
		Moodle	++	
		Blackboard v6	++	The teacher can review any tests which have been taken, or use course statistics tools to see what material has been accessed. The course statistics should be treated with caution as they relate to page hits rather than a more robust indicator of users having accessed material.
	The teacher can make a study indicator for subgroups/individual students. ++ both, + just total group of students, - not	N@tschool	++	
		WebCT	+	
		Moodle	-	
		Blackboard v6	++	
4	Which user data can the platform register?			
	to follow courses	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	the consulting of documents (teachers/ students)	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Course statistics provide some evidence of session times, but the data should be treated with caution.
	session time and course totals	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Blackboard records the scores of each individual taking a test.
	making of tests	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	test results	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	to hand in assignments	N@tschool	Yes	

	to participate in communication email	WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
		N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	Yes	
	to participate in communication discussion	N@tschool	Yes	This feature is optional in N@Tschool, but is not activated in the Fontys N@Tschool at this moment.
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Progress report (assignments results)	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
5.	Does the tele-learning platform contain an electronic portfolio for:			
	documents	N@tschool	Yes	
		WebCT	No	There is no separate portfolio tool, but the student presentations tool can be used to create a portfolio.
		Moodle	No	
		Blackboard v6	No	Not a portfolio tool as such, There is a digital drop box for sending material to the tutors, but this is not a fully fledged portfolio building tool

	results of already obtained competences	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
	progress data of student	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
6.	Can the portfolio of the student be consulted/supplemented by:			
	the student?	N@tschool	Yes	It depends of the rights allocated in N@Tschool.
		WebCT	n.a.	
		Moodle	n.a.	
	the coach?	Blackboard v6	n.a.	
		N@tschool	Yes	It depends of the rights allocated in N@Tschool.
		WebCT	n.a.	
	the administrator?	Moodle	n.a.	
		Blackboard v6	n.a.	
		N@tschool	Yes	It depends of the rights allocated in N@Tschool.
		WebCT	n.a.	
		Moodle	n.a.	
		Blackboard v6	n.a.	
7.	The structure of data exchange is open, that means that it is easy to put existing data in the system/linking to the system.			
	The teacher or student can make a review of (own) results and disciplines made.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	Yes	The student can see the results of their tests, they can see what courses they are studying through the “my blackboard” facility
	There is a possibility for a personal study indicator next to a study indicator by group.	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	Yes	
	Conclusions about future sections for students can be	N@tschool	No	

	drawn by the system if the developer/teacher this desires.	WebCT	No	
		Moodle	No	
		Blackboard v6	Yes	
	The teacher can make new groups.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Yes, the teacher can create new groups but only from users already registered on the system
	What type of communication possibilities does the platform supports?	N@tschool	Yes	
		WebCT	Yes	
	e-mail between users platform	Moodle	No	
		Blackboard v6	Yes	Blackboard supports email sent from the platform itself
	external mail can be received	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	There is no feature to link to any external email system
	discussion group/forum	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Blackboard does have discussion group and forum tools
	possible per group	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
	possible per course	Blackboard v6	Yes	
		N@tschool	Yes	
		WebCT	Yes	
	possible per organisation	Moodle	Yes	
		Blackboard v6	Yes	
		N@tschool	No	
		WebCT	No	
	chatting/whiteboard	Moodle	Yes	
		Blackboard v6	No	
		N@tschool	Yes	
		WebCT	Yes	

	videoconferencing	Moodle	Yes	
		Blackboard v6	Yes	Blackboard does have a chatting facility which contains an virtual whiteboard and related tools
		N@tschool	Yes	
		WebCT	No	
	separate provision for documents parts	Moodle	No	
		Blackboard v6	No	
		N@tschool	No	
		WebCT	No	We did not entirely comprehend the meaning in this context.
	calendar and tasks	Moodle	Yes	
		Blackboard v6	No	
		N@tschool	No	
		WebCT	Yes	
	personal homepage	Moodle	Yes	
		Blackboard v6	Yes	
		N@tschool	No	
		WebCT	Yes	
	many asked questions	Moodle	No	
		Blackboard v6	Yes	There is a personal home page space where users can add information, links and upload photographs
		N@tschool	Yes	Not in N@Tschool itself, but at the website www.fontys.nl/natschool.
		WebCT	Yes	It has to be done as a separate page, there is no actual tool for this.
		Moodle	Yes	
		Blackboard v6	No	FAQ tools are not implemented in Blackboard

Questions of importance for the role of the student

		ELO	Yes/No or --, -, +, ++	Remarks
8.	The student can make a review of results and disciplines he/she made.	N@tschool	Yes	
		WebCT	Yes	The course planner can decide whether this is possible or not.
		Moodle	Yes	
		Blackboard v6	Yes	
9.	The student can take a look at a review of tasks, learning order per module or course.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Tasks can be set using Blackboard using the dedicated “tasks” tool
10.	The tele-learning platform supports these communications possibilities:			
	e-mail between students who use the platform and the teacher/coach;	N@tschool	Yes	
		WebCT	No	E-mail is only possible between the participants of a course.
		Moodle	No	An Internal Messaging is available from May 2005. That isn’t e-mail per se, but more similar to ICQ or AIM
	e-mail of external experts can be received;	Blackboard v6	Yes	
		N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
	discussion group/forum	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	for the module/course	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	for the group of students who follow the module/course	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	

	for a subgroup he/she is in	Blackboard v6	Yes	
		N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
	chatting	Blackboard v6	Yes	
		N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
	videoconferencing	Blackboard v6	Yes	
		N@tschool	Yes	Using Netmeeting
		WebCT	No	
		Moodle	No	
	separate provision for documents parts	Blackboard v6	No	
		N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	No	

	calendar and tasks	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	Blackboard does have a calendar tool where the teacher can post significant events
	personal homepage	N@tschool	No	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	Yes	
	many asked questions	N@tschool	Yes	Not in N@Tschool itself, but at the website www.fontys.nl/natschool.
		WebCT	No	The students can only ask questions by e-mail.
		Moodle	Yes	
		Blackboard v6	No	
11.	The tele-learning platform contains a portfolio with documents and/or results of already gained competences and progress data which the student can consult and/or complete.	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
12.	Does the tele-learning platform support different languages.	N@tschool	Yes	There is the possibility to choose the Dutch or English language.
		WebCT	Yes	
		Moodle	Yes	There are over 30 language packs or translations.
		Blackboard v6	Yes	Blackboard is available in different language packs
13.	One password is enough for all parts of the course/education.	N@tschool	Yes	To get into N@Tschool you have to log in once to use all the features, except the forum, therefore you have to log in again (with the same password)!
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
14.	Navigation within the tele-learning platform is :	N@tschool	++	
		WebCT	+	
		Moodle	++	
	++ outstanding, + good, - bad, -- very bad	Blackboard v6	+	This depends on the subjective viewpoint of the user, difficult to answer for all users in all situations

Organisation/management criteria: registration, data exchange, routing

Questions of importance for the role of administrator (and application administrator)

15.	In what way the student's data will be transmitted from the administration to the tele-learning platform (and the other way around)?			
	By means of exporting/importing: to export a list of data from the administration and to import that list in the tele-learning platform by putting the data in the computer manually. ++ by means of a fixed data format, +/- to use a standard format, - by means of manual import	N@tschool	+/-	Using the IMS Enterprise format.
		WebCT	++	
		Moodle		Moodle has extensive bindings to middleware and databases. Most data can be exchanged dynamically. LDAP is the most used middleware.
		Blackboard v6	++	Blackboard is sold as having excellent connectivity with administrative databases. The enterpriser edition comes at a premium cost because of these features
	By means of exchange: the tele-learning platform is capable of reading the data of the administration system electronically, without interference. ++ by means of a wizard or template, +/- by means of a fixed data format, - no exchange	N@tschool	-	
		WebCT	++	The costs for using this feature are not reasonable.
		Moodle	+/-	Using middleware (LDAP)
		Blackboard v6	++	
	By means of, dynamic or not, linking of both systems. ++ tele-learning platform uses the administrators data bank, + automatically at regular times, +/- only by order of the administrator, - no linking possible.	N@tschool	+	
		WebCT	++	The costs for using this feature are not reasonable.
		Moodle	++	
		Blackboard v6	++	Although the costs of this feature are high
16.	In what way the administration and tele-learning platform data are being synchronised?			
	The data of the tele-learning platform are the same as those of the student's specifications in the administration.	N@tschool	Yes	
		WebCT	Yes	There is only a small number of data available.
		Moodle	Yes	
		Blackboard v6	No	The data on Blackboard relates only to courses the student is attached to. Other data (such as course scores and so on), remains on the dedicated Student management system
	The data can be exchanged at regular times by commands in	N@tschool	No	
		WebCT	No	

	both kits, automatically or not.	Moodle	Yes	
		Blackboard v6	Yes	
17.	In what way the results of the assignments and tests are being transmitted to the tele-learning platform?			
	By means of exporting/importing: to export a list of data from the administration and to import that list in the tele-learning platform by putting the data in the computer manually. ++ by means of a fixed data format, +/- to use a standard format, - by means of manual import.	N@tschool	-	
		WebCT	-	General comment: the need for this has not occurred. It has in general been reverse, i.e. from the platform to the administration.
		Moodle	++	
		Blackboard v6	n.a.	Data and tests are not transmitted in this way
	b). By means of exchange: the tele-learning platform is capable of reading the data of the administration system electronically, without interference. ++ by means of a wizard or template, +/- by means of a fixed data format, - no exchange.	N@tschool	-	
		WebCT	+/-	
		Moodle	+/-	
		Blackboard v6	++	

	By means of, dynamic or not, linking of both systems. ++ tele-learning platform uses the administrators data bank, + automatically at regular times, +/- only by order of the administrator, - no linking possible.	N@tschool	-	
		WebCT	+/-	
		Moodle	-	
		Blackboard v6	+	
18.	In what way the results of the assignments and tests of the administration and the tele-learning platform are being synchronised?			
	The data of the tele-learning platform are the same as those of the assignments and tests.	N@tschool	No	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	No	
	The data can be exchanged at regular times by commands in both kits, automatically or not.	N@tschool	No	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	Yes	
19.	Which kind of user data can the tele-learning platform register?			
	to follow a course	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	to consult documents (teachers/ students)	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	session and total time of the course	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	making of tests	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	test results	N@tschool	Yes	

	to hand in assignments	WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
		N@tschool	Yes	
	communication participation e-mail	WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
		N@tschool	Yes	
	discussion	WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	
		N@tschool	Yes	
	progress report (assignments results)	WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
20.	In what way does the system show the data that are filed?			
	by means of a table with all data	N@tschool	Yes	
		WebCT	Yes	
		Moodle	n.a.	In Moodle tools implement didactical processes and the way data is shown depends on the context.
		Blackboard v6	n.a.	As with Moodle, data is dependent on context
	by means of a table which is sorted according to demanded data	N@tschool	No	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	No	
	by means of a form with selection and print options.	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	Yes	

21.	In what way does the system show the progress results of the student?			
	by means of a table with all data	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	No	
	by means of a decision of teacher/coach	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	No	
	by means of interference by the administrator	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
	not	N@tschool	n.a.	
		WebCT	n.a.	
		Moodle	n.a.	
		Blackboard v6	Yes	
22.	Is the procession of the study results computerised for the benefit of the progress?	N@tschool	Yes	
		WebCT	No	
	according to fixed criteria	Moodle	No	
		Blackboard v6	Yes	
	according to adjustable criteria	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	
	not.	N@tschool	n.a.	
		WebCT	n.a.	
		Moodle	n.a.	
		Blackboard v6	n.a.	
23.	Does the system contain a portfolio with documents and/or results of already obtained competences and progress data of the student?	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
24.	Can the portfolio of the student be consulted and/or completed :	N@tschool	Yes	It depends of the rights allocated in N@tschool.

		by the student	WebCT	n.a.	
			Moodle	n.a.	
			Blackboard v6	n.a.	
		by the coach	N@tschool	Yes	It depends of the rights allocated in N@tschool.
			WebCT	n.a.	
			Moodle	n.a.	
			Blackboard v6	n.a.	
		by the administrator	N@tschool	Yes	It depends of the rights allocated in N@tschool.
			WebCT	n.a.	
			Moodle	n.a.	
			Blackboard v6	n.a.	

25.	The structure of data exchange is “open” that means that it is easy to put existing data in the system and/or to link to the system and it is possible to withdraw the data meanwhile.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	Moodle is open system in that you can get to all data. Any data representable in a relational database or as a file in a POSIX-compliant file system can potentially be included.
		Blackboard v6	Yes	Blackboard does support SCORM and IMS import of data
	For the exchange of data, use is being made of an open structure which is supported by AICC, IMS, CMI for ranking systems and administration systems, for test systems and/or for meta data and content packaging.	N@tschool	Yes	The system is based on the IMS-standard. Content which will be complied with the specifications of the IMS content packaging can be imported.
		WebCT	Yes	
		Moodle	Yes	Moodle’s support of “learning standards” is incomplete (but not non-existent).
		Blackboard v6	Yes	Some support for “learning standards” such as SCORM
	The administrator can make a review of results and disciplines taken.	N@tschool	Yes	
		WebCT	No	
		Moodle	No	Administrator can access all the required data, but no tool is provided for such aggregation.
		Blackboard v6	No	As above, the administrator can see test scores and students registered on courses
	To register online for a course or module is possible for the student.	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	No	
	A test made by use of an external programme can be linked, where as the data are being exchanged with the platform.	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	A few such tools are supported, mainly Flash and Hotpot. Unsupported may still interact with Moodle but building such links requires specialist knowledge.
		Blackboard v6	No	

	Exchanging of data between a student administration system/ranking system and the platform is possible.	N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	No	
	Conclusions about future sections for students can be drawn by the system if the developer/teacher this desires.	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	The system can be made to produce a survey about future improvements to courses. These changes would be implemented by the tutor with the system merely collecting data
	Concerning the registration it is necessary to work online.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	Account creation and enrolment to courses can be linked to a student information system or it can be done online by teachers or students.
		Blackboard v6	Yes	
	Concerning debiting to an account at the start or a counter there is a paying system.	N@tschool	No	
		WebCT	No	
		Moodle	Yes	Enrolment to courses can be linked to payment systems.
		Blackboard v6	No	
	Depending on the number of users there is a payment system for usage of material to third parties which are owner.	N@tschool	No	
		WebCT	No	
		Moodle	No	Payments are per course.
		Blackboard v6	No	

Criteria concerning the infrastructure*:* the technical scope

Questions of importance for the role of system manager/ application administrator

26.	The structure of data exchange is "open" that means that it is easy to put existing data in the system and/or to link to the system and it is possible to withdraw the data meanwhile. For the exchange of data, use is being made of an open structure which is supported for example by AICC, IMS, CMI.	N@tschool	Yes	The system is based on the IMS-standard. Content which will be complied with the specifications of the IMS content packaging can be imported. Not tested!
		WebCT	Yes	
		Moodle	Yes	Moodle supports open standards like XHTML, CSS and HTTP/1.1 and some closed-but-widely-used formats like Flash/SWF and MP3. Moodle stores its data in a relational database and the file system of the host server, both of which are "open".
		Blackboard v6	Yes	
	E-mail			
27.	Does the platform provide for e-mail communication?	N@tschool	Yes	
		WebCT	Yes	
		Moodle	No	Moodle for most part does not use e-mail, but the May 2005 version will support Internal/Instant Messaging, which as a concept is similar to but distinct from e-mail.
		Blackboard v6	Yes	
	Is it possible to directly send mail amongst the platform users?	N@tschool	Yes	By means of an exchange server.
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	Yes	As long as they have external email addresses
	by means of an existing POP-server (outside the platform).	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	Yes	
	by means of a POP-server which is a unit of the platform.	N@tschool	No	
		WebCT	No	
		Moodle	No	
	Can the platform receive external e-mail?	Blackboard v6	Yes	
		N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	

	readable via the web	N@tschool	n.a.	
		WebCT	n.a.	
		Moodle	n.a.	
		Blackboard v6	n.a.	
	readable via the web and with own dedicated client.	N@tschool	n.a.	
		WebCT	n.a.	
		Moodle	n.a.	
		Blackboard v6	n.a.	
	readable via the web and with standard POP-client	N@tschool	n.a.	
		WebCT	n.a.	
		Moodle	n.a.	
		Blackboard v6	n.a.	
	Is it possible to use an own (existing) e-mail address within the platform?	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	Users may include their existing e-mail address in their profile. This can be used to launch an e-mail client if the client and web browser support that action. Also forum posts can be forwarded to the email-address.
		Blackboard v6	Yes	Yes it is. In fact an external email address is needed for the onboard email system to work.
	Is it possible to send and receive attachments?	N@tschool	Yes	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	Yes	

	Discussion group/forum			
28.	The platform supplies provision for discussion groups.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Discussion groups are possible per: group (students and teacher use discussion group)	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	course (a number of groups use the same discussion group)	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
	organisation (all users use the same discussion group).	Blackboard v6	No	Not possible, users must be subscribed to the same module
		N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	The whole organisation/site can participate in the same discussion. Site-wide subgroups aren't possible.
		Blackboard v6	No	Not possible, users must be subscribed to the same module
	Is it possible to send and receive attachments?	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Is it possible to moderate a discussion group? Who is capable?	N@tschool	Yes	Teacher, it depend on the permission
		WebCT	Yes	The teacher is capable of doing this
		Moodle	No	There is a rating/grading system and teachers can delete messages and those can be used to moderate a discussion, but there isn't any tool for that exact purpose.
		Blackboard v6	Yes	Any user can be nominated to moderate a discussion group, various levels of permissions can be set by the administrators and tutors on each of the courses

	To chat/whiteboard			
29.	The platform supplies provision for chatting/ whiteboard.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Chatting is possible per:			
	group (students and teacher use their own chat room)	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	1 course (a number of groups use the same chat room)	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	No	Not possible as all chat participants need to be subscribed to the same module
	organisation (all users use the same chat room).	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	No	
	Can you distinguish various roles in the chat room?	N@tschool	Yes	
		WebCT	No	
		Moodle	No	Roles aren't apparent, but user identity is.
		Blackboard v6	Yes	Tutors and students are marked differently in the chat windows
	Videoconferencing			
30.	The platform supplies provision for videoconferencing.	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	

	Sharing of documents			
31.	The platform supplies provision for the sharing of documents (pay attention: sharing of documents via e-mail or discussion group is not a part of this).			
	Asynchronous: It is not possible to work at documents at the same time. documents stay on the server during editing.	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	Text and html documents can be edited "online". Other documents (e.g Word.doc) have to be edited "offline".
		Blackboard v6	No	
	documents have to be downloaded and put back on the server synchronic: it is possible to work at documents at the same time.	N@tschool	No	
		WebCT	Yes	
		Moodle	No	Synchronic offline editing is not possible.
		Blackboard v6	Yes	Documents need to be downloaded, changed offline, and then replaced
	Can you distinguish various roles (for example: does the teacher or document owner have different rights)?	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	
	Calendar and tasks			
32.	The platform supplies provision for calendar and tasks.	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6		
	Calender and tasks are possible per: individual	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	group (students and teacher use the same calender and/or tasks;	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	organisation (calendar of organisation is being used for announcements).	N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	

	Can you distinguish various roles?	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	What do you mean by distinguish here?
33.	**Personal homepage** The platform supplies provision to create a personal homepage.	N@tschool	No	
		WebCT	Yes	
		Moodle	No	
		Blackboard v6	Yes	Staff can create information home pages, and students can also create homepages.
	Many asked questions			
34.	The platform supplies provision for many asks questions (FAQ).			
	per module	N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	No	
	per course	N@tschool	No	The FAQ has to be conducted as a manually updated www-page.
		WebCT	No	
		Moodle	Yes	
	per education	Blackboard v6	No	
		N@tschool	No	
		WebCT	No	
		Moodle	Yes	
	about the platform	Blackboard v6	No	
		N@tschool	Yes	At the website www.fontys.nl/natschool.
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	
	Is there a search function at the FAQ-s?	N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	
	Is it possible to navigate easily between the many various asked questions?	N@tschool	Yes	
		WebCT	No	
		Moodle	No	
		Blackboard v6	Yes	

35.	Does the platform demand a separate client for the course and material developer?	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	
36.	The platform can operate on following servers:			
	Windows NT/2000 server	N@tschool	Yes	Also Windows ’98 and XP.
		WebCT	Yes	
		Moodle	Yes	Officially supported.
		Blackboard v6	Yes	
	Unix/linux	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	Officially supported and primary.
		Blackboard v6	No	
	Mac	N@tschool	No	
		WebCT	No	
		Moodle	Yes	Possible, but not officially supported.
		Blackboard v6	No	
	Novell	N@tschool	No	
		WebCT	No	
		Moodle	No	
		Blackboard v6	No	

37.	Usable browser on the user machine Internet Explorer	N@tschool	Yes	Version 5.5 or higher!
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Netscape Navigator	N@tschool	No	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Different, namely……..	N@tschool	No	
		WebCT	Yes	Firefox, Opera, etc.
		Moodle	Yes	
		Blackboard v6	Yes	Firefox, Firebird and Opera appear to work without problems.
38.	Is the management of rights provided via the tele-learning platform and who has that right (System manager/application manager/administra-tor/teacher/student)?	N@tschool	Yes	Administrator, but in some cases also the student.
		WebCT	Yes	System manager and teacher.
		Moodle	Yes	System manager and teacher.
		Blackboard v6	Yes	Administrator
39.	Safety:			
	Is there a back up within the platform?	N@tschool	No	The Fontys back up is automatically, not only for N@Tschool.
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Is there a protection of personal information (results, e-mail)?	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Is there a protection of rights of the course material?	N@tschool	Yes	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	Yes	

40.	The maximum capacity of one server: workability up to 1000 students/200 courses/two study points	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	workability 10.000 students/a number of 200 courses of 8 study points each.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	Workability for tens of thousands of users and thousands of courses.
		Blackboard v6	Yes	Numbers of students is controlled by the size of the server hard drive(s) rather than the platform itself.
	Does the platform support the linking of servers?	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Costs and general criteria			
41.	The most important customer relation of the system. ++ in your country, + Europe, - VS/Canada, -- unknown where			
	Universities/Higher Vocational Education	N@tschool	++	
		WebCT	-	
		Moodle	+	Around the world
		Blackboard v6	++	Probably the US and the UK
	Intermediate Vocational Education	N@tschool	++	
		WebCT	-	
		Moodle	+	Around the world
		Blackboard v6	++	Probably the US and the UK
	Companies	N@tschool	++	
		WebCT	-	
		Moodle	+	Around the world
		Blackboard v6	++	Probably the US and the UK

42.	User-friendly			
	Official language of your country is one of the options.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	Yes	
	Well-defined log in procedures. ++ outstanding/one password, + good, - bad, -- very bad	N@tschool	++	To get into N@Tschool you have to log in once to use all the features, except the forum, therefore you have to log in again (with the same password)!
		WebCT	+	
		Moodle	++	
		Blackboard v6	++	Yes, a unified login procedure for Blackboard giving access to all modules a student is subscribed to
	Help function for developer, teacher, student, manager. ++ outstanding/one password, + good, - bad, -- very bad	N@tschool	+	
		WebCT	+	
		Moodle	++	
		Blackboard v6	++	Blackboard does have help files and manuals for teachers and students.
	User interface. ++ outstanding/ easy to handle/ to navigate and work within 1 window, + good, - bad, -- very bad	N@tschool	++	
		WebCT	+/-	
		Moodle	++	
		Blackboard v6	+	
	Adjustment of user interface is possible by developer.	N@tschool	No	
		WebCT	No	
		Moodle	Yes	
		Blackboard v6	No	Not really possible. Some adjustments (to colours and button styles is possible), but large scale modifications of the interface are not permitted
	Signal when new information/mail arrives.	N@tschool	Yes	
		WebCT	Yes	
		Moodle	Yes	
		Blackboard v6	No	
43.	Who is the producer of the tele-learning platform?	N@tschool		Three Ships enterprises BV Website: www.threeships.nl
		WebCT		A commercial enterprise.
		Moodle		Open source (moodle.org)
		Blackboard v6		Blackboard (available at Blackboard.com)

44.	Who is the supplier of the tele-learning platform?	N@tschool		www.threeships.com
		WebCT		www.webct.com
		Moodle		www.moodle.org
		Blackboard v6		www.blackboard.com
45.	Are the costs of the tele-learning platform fixed or depending on custom-made?	N@tschool		Depending on custom-made.
		WebCT		Depending on custom-made.
		Moodle		The Moodle software is free
		Blackboard v6		Depending on custom-made.