MOTIVATE

CASE STUDIES
MOTIVATE

Masters level Opportunities and Technological Innovation in Vocational Teacher Education

Case Studies

2009
„Docendo discimus."

(Seneca)

When motivating others for life long learning, we do motivate ourselves as well.
Contents

INTRODUCTION ......................................................................................................................... 9

Review of the Project MOTIVATE - Masters level Opportunities and Technological Innovation in VocAtional Teacher Education
(David Lord – Pal Pentelenyi) ..................................................................................................... 9

TECHNOLOGICAL INNOVATION .......................................................... 17

The Changing Teacher and the Internet
(Hanna Torp) .......................................................................................................................... 17

From Traditional Lecturer to Blended Tutor: a Case Study Exploring one Tutor’s Successful Transition
(Andrew Youde) ....................................................................................................................... 41

Investigation of Online Learning Process in Moodle by Web-mining Methods
(Peter Toth) ............................................................................................................................. 56

Masters Level Student Teachers and On Line Learning Communities: a Portuguese Case Study
(Carolina Santos – Teresa Oliveira – Lourenço Frazão – Sofia Oliveira) .......................... 72

Social Software in Class: yet another Hype or Serious Opportunities?
(Gijs de Bakker) ....................................................................................................................... 91

Connectivism in Masters Level Courses: Experiences Gained in Dunaujvaros through the MOTIVATE Project
(Laszlo Kadocsa - Gyula Guban) ............................................................................................ 102

MASTERS LEVEL OPPORTUNITIES .................................................. 113

Master Level Opportunities for the Greek TEIs
(Haris Papoutsakis) ................................................................................................................ 113

Educating Innovative Entrepreneurs: Graduate and Master Level Courses for the Greek TEIs
(Haris Papoutsakis) ................................................................................................................ 121
COMMON MODULE DELIVERIES

Case study on Teaching Specialist Subjects
(Agnes Toth) 139

Conclusions about E-pedagogy in the Common Module Delivery
(Elsayed Hassan) 146

The Student Perspective on the MOTIVATE Common Modules
(Gabor Klucsik) 152

QUALITY MANAGEMENT

QMS Analysis of the Pedagogy Forums
(Adam Balazs Toth – Anna Beres) 163

Comparing the MOTIVATE Project Module Delivery
with Other E-learning Experiences
(Peter Ludik) 169
INTRODUCTION

Review of the Project MOTIVATE - Masters level Opportunities and Technological Innovation in VocAtional Teacher Education
(David Lord – Pal Pentelenyi)

Introduction

This paper sets out to review the progress made and achievements gained in the MOTIVATE project, with specific reference to the aims, objectives and intentions in the original project proposal.

The Motivate project has transferred innovatory practices and developments to benefit the two Hungarian higher education institutions in the partnership. The innovation is twofold: the introduction of Masters level modules into the vocational and technical teacher education programmes, and the use of new and emerging technologies in the implementation of the developed curriculum. The other partners of the consortium have had the necessary expertise to provide this innovation. The UK partner, with considerable prior experience of development and delivery of Masters level professional development courses in the Vocational Education and Training (VET) field, was the main provider of the innovation. All partners have had experience of VET curriculum development and technological innovation in its delivery.

The development of Master Level modules in the UK has been identified as an opportunity to facilitate concurrent development in partner institutions across Europe.

Innovative solutions for sharing aims, objectives and assessment criteria include the use of social software and collaborative Web 2.0 technologies, which facilitate the creation of new online communities of European partners. Platforms for the community such as Associate Online and Second Life served as existing examples of good practice.
Intangible outcomes include the potential to disseminate the expertise gained in order to widen this community so that it can encompass new partners or involve trainee teachers across different institutions and countries in similar collaborative efforts. One particular advantage was the development of Subject Specialist communities for VET teachers that, because of the reach of internet based technologies, can facilitate much larger groups of subject specialists than are possible in face to face contexts.

The main impact of the project is to enhance the professional status of teachers in vocational and technical fields by the provision of a coherent programme of initial teacher training and continuing professional development, incorporating Masters level elements.

**Background of the project**

The main focus of the project was the development of new Masters Level modules at the partner institutions, and in the creative use of technology to disseminate and support the new provision. This occurred against the background of a requirement for curricula which support lifelong learning and the professionalisation of VET professionals in the partner institutions, and may support similar developments in other institutions in the future. Masters level curricula requirements demand that all participating institutions compose their vocational teacher training in accordance with the Bologna system.

**Aims and objectives**

The specific aims of the project:

a. To develop a methodology for assessing the institutional requirements for development of Masters Level VET qualifications

b. To develop a common framework for VET professionalisation to address these institutional requirements

c. To develop parallel Masters Level VET qualifications in each of the partner institutions in order to support lifelong learning and professionalisation in the sector.
d. To utilise Web 2.0 technologies to facilitate these developments

e. To create staff development programmes to support the use of these technologies

This project aimed to identify common criteria, develop a working framework for the professionalisation of VET and to implement the framework in a number of institutions across Europe. To this end, it sought to develop parallel VET qualifications at Masters Level in each of the institutions of the partnership, working from an agreed common framework. In order to support lifelong learning, the resulting qualifications were made available as training opportunities for both initial trainees and as continuing professional development for existing VET professionals.

Technical innovations at the University of Huddersfield in the UK include the application to teacher education of Web 2.0 technologies (such as social bookmarking, social networking, blogs, wikis and Second Life) and the creation of a national collaborative platform called Associate Online. This platform facilitates the formation of large, online subject specialist communities, allowing the geographically dispersed cohort to identify and interact with other VET professionals working in a similar field to their own. Fontys University, the project partner from the Netherlands, with a long tradition of innovative use of ICT in education, contributed significantly to the input on Web 2.0 technologies. In particular, the Dutch partner shared significant expertise in the potential use of Second Life in the VET setting. Similarly, developments in Finland in the provision of video conferencing contributed to the project. The project exploited the opportunities presented by these innovations, using them to facilitate collaboration between the project partners, and in the longer term, between the students of the partner institutions.

**Target groups**

The limited mobility of VET teachers, the different national requirements to which they are subject, and the cultural and language barriers extant between them, mitigated against student exchange. Development of parallel qualifications and online strategies for exchange between these client groups has ameliorated the effects of
these barriers and facilitated the sharing and development of expertise in the field.

Students training to be vocational teachers are the direct beneficiaries, in terms of increased opportunities for lifelong learning and the scope to gain higher qualifications for continuing professional development. They also benefit from participation in online communities, both in terms of the consequent access to the kinds of large, vibrant communities of practice required for effective collaboration, and in terms of developing skills in the use of Web 2.0 technologies in education.

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

Whilst the project partners are drawn from across Europe, and therefore possess considerable socio-economic and cultural diversity, the wider audience for the project is pan European, and includes all providers of training for VET professionals. The project provides models both for collaboration and for curriculum development for these institutions. Vocational teacher training institutions of the partner countries are the secondary target groups of the project.

Staff working on Vocational Teacher education courses have also benefited from the project, and were able to update and extend their knowledge of the European context of vocational education. By providing a forum for the exchange of information and ideas about European co-operation, and doing so in a way which uses state of the art technology, the project brought about the modernisation of Vocational ITT, and highlighted the value of trans-national co-operation. Parallel developments also provided scope for application of credit transfer systems based on ECVET principles and conventions, in particular in the recognition of learning outcomes for
Masters Level VET qualifications in the development of a coherent European credits framework.

**Innovative technologies upon which the project is based**

Uses of Web 2.0 technology currently being implemented at the University of Huddersfield include the development of social networks and e-portfolios, incorporating blogs, wikis and podcasting. These innovative uses of technology are being used to support widening participation, making learning available to non-traditional students and adult returners to Education, because of the ‘anytime, anyplace’ nature of the activities. This provides lifelong learning opportunities for students who have family and work commitments that would otherwise prohibit their entry into Education.

**Project results/products**

1. The project web site was created in the first work package (WP) of the project. The website is used not only for sharing information on the project but also for dissemination of all project products (e.g. curriculum development, module development, case studies, innovation transfer of multimedia applications etc.)

2. Curriculum documents for the Masters level in-service (lifelong learning) vocational teacher training curriculum in mechanical, electrical and IT engineering were prepared in the second work package.

3. Module specifications for Masters level in-service training and associated guidelines for study were prepared in the third work package.

4. Course materials in the form of a handbook for studying and applying multimedia methods in vocational training were also produced in WP3.

5. On-line communities for staff and students of in-service teacher training were created in WP4. In terms of utilisation of virtual learning environments, Moodle was chosen to provide the platform for sharing training modules and to take advantage of synchronous/asynchronous discussion facilities.
6. A book of case studies (to include this paper), covering all aspects of the project, is to be published for the vocational training area to disseminate information for management and decision makers (WP5).

7. Conference proceedings are to be published for dissemination of project findings and to provide a summary of the curriculum evaluation processes and quality assurance reports. (WP6)

Outputs relating to information and communication technologies

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

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

ICT as a tool for dissemination
ICT has been used for dissemination mostly via the project website and wiki, but also CD ROMs were sent to the management of VET schools and VET teacher training institutions. At the end of the project videoconferencing will be used to disseminate project results (in the form of conference papers delivered) to audiences at the partner institutions.
Concluding remarks

This paper has reviewed the progress made in the Motivate project, and has shown the achievements of the Motivate partners in project activities, as they relate to the original proposal. It remains, in conclusion, to provide an overview of the project tasks completed in satisfying the project objectives.

The investigations into the structure of Masters level VET qualifications in the participating countries of the partnership resulted in the development of three common modules, in Multimedia and E-learning, Advanced Pedagogy, and Teaching a Specialist Subject. The modules were successfully incorporated into the credit transfer systems of the partner countries. Also, the modules were designed to address the issues of lifelong learning and professionalisation of the VET sector. This represents successful achievement of the first three aims of the project (listed above).

Furthermore, in common module delivery, Web 2.0 technologies were implemented, and extensive use was made of the facilities provided by the Moodle-based virtual environment. The module delivery involved collaboration and discussion between partner institutions, with activities moderated and directed by expert tutors from the donor institutions. Staff development was achieved by dissemination of techniques and skills by these experts, and also through completion of the modules themselves. These activities covered the remaining two project aims.

It is evident from this concluding section that, at the stage of the project where dissemination of project results begins, the partners have been successful in achieving the originally proposed project aims and objectives.
TECHNOLOGICAL
INNOVATION

The Changing Teacher and the Internet
(Hanna Torp)

Introduction

The rapid and irreversible development of technology and the modern information society makes teaching and education face their core questions in a new light. The entire conception of learning, teaching and expertise is changing. New online tools, such as blogs, wikis and video sharing applications change the idea of content creation and ownership of knowledge and learning in a dramatic way. Learning environments as well as working life requirements become more diverse and ambiguous. When all this is combined with network organizations, self-directed teams, globalization and intercultural collaboration, it is no wonder if teachers feel puzzled and even threatened.

As a result of the MOTIVATE project, an international online module was designed and implemented for European teacher students to introduce e-learning tools, pedagogical considerations and the changing conception of learning and teaching. The approach of the module is collaborative and dialogic.

The aim of this paper is to shed light on the changes in the information society and their impact on education, as well as describe the experiences gained with the online module. The pedagogical principles applied in the development and implementation of the module are introduced and the teacher students’ ideas, opinions and views on both the online module and the themes it introduces are also discussed and analyzed.
Why should the teacher change?

The most important question to be asked is of course whether and why any change should take place regarding formal education and teachers’ work. This is also one of the main questions the teacher students were faced with during the online module. The views of the students will be discussed in more detail in section 5. First, however, a comprehensive look at the trends in working life and the society is needed.

The technical revolution

When talking about e-learning, the most obvious change that comes to mind is probably the technical development. Of course it cannot be denied that e-learning as a phenomenon would not be possible without the development of the ICT sector. Computers, high-speed Internet connection and more or less user-friendly learning management systems have made the technical development in education a reality. However, this does not yet imply that something essential in teacher’s work would be facing a change. Can we see a difference in e-learning compared to education technological innovations in the past? The overhead projector and more recently the data projector are results of technological development, as are online learning environments. However, the overhead projector and data projector are used for the very same educational function as the traditional blackboard: illustrating, or – perhaps even more frequently – summarizing the main points of a teacher-led lecture. The teachers using these appliances have had to study the usage of a new tool, but the tools have not necessarily affected the approach they have to their work. As for e-learning, there is a growing consensus on the fact that it is not merely about using a new tool to do the exact same thing in a slightly easier or more efficient way, or wrapping the existing learning content in a different-looking package. The teacher’s role has to be reconsidered.

There are a few misconceptions about the changes in the role of a teacher in an e-learning context. A view that was popular when e-learning was a novelty was that of the teacher becoming obsolete. E-learning was seen as first and foremost self-study, or, more alarming, the computers themselves would be considered the teachers. However, as Koponen (2008) points out, e-learning can be applied both in self-
study and in teaching, in informal learning as well as in formal education. As he reminds us, it is essential to be clear and consistent in the definitions of “teaching” and “learning”. Self-study usually takes place in informal learning situations, whereas in formal education the teacher is often irreplaceable, as is the case in e-learning:

We think that the teacher's role in the learner's learning is to be an expert and to support the learner acquiring information, making perceptions and getting new experiences, as well as to support learner's own thinking. This support for the learner may be called teaching. In e-learning the teacher's role is to utilize ICT in supporting the learner's learning.

(Koponen, 2008)

If the teacher's role in e-learning is this similar to the one in traditional learning, can it not be argued that e-learning is simply a new tool the teacher has to study, much in the same way as with the examples of the overhead projector and data projector, and that no greater change is involved? Lynch (2001) rejects this conception by emphasizing that the transition from conventional teaching to e-learning requires a fundamental change in attitudes and ways of thinking about learning and teaching. The transition must not be merely about moving conventional learning to Internet, but about enriching and changing it (Lynch 2001).

There is yet another question that needs to be asked and answered. If e-learning requires a change from the teacher, is it possible to avoid the change by ignoring e-learning altogether? Why not continue the same way as before? After all, there has always been technical innovation present, without such profound impact on the conception of education. To answer this question we need to examine the nature of the current technical development. This can be done by contrasting it with technical innovation in the past.

The push-button phone is a much further developed version of the old, wall-mounted wind-up telephone with separate ear and mouth pieces. It is much smaller, faster and more convenient to use. However, the
two are serving the exact same purpose. On the other hand, the smart phones of today are not merely used for carrying a telephone conversation; they are multi-purpose devices that provide Internet access, music player, data management, digital camera, GPS and much more. They provide a new way of creating, sharing and handling information in various formats. Therefore the change is not first and foremost about an updated version of an existing tool. Instead, it is a paradigm shift. Whereas the transformation from the open-reel tape recorder to the CD player is ultimately an update of an existing tool intended for playing a musical recording, the transformation from the CD player to social online music services (e.g. Spotify) providing the opportunity to download any song any time, create playlists, share them with friends and even modify a collaborative playlist is a paradigm shift. It is a new way of creating, sharing and handling information. As Shirky (2008) puts it – in a provocative manner but very aptly - the social tools are not an improvement to modern society, they are a challenge to it.

The same phenomenon can be seen in the development of many applications. The development is no longer merely technological but it involves a profound change regarding the conception of information. As Downes (2005) points out, the emergence of Web 2.0 is not a technological revolution or a technology; it is a social revolution and an attitude. This inevitably encompasses changes in the conceptions of learning and expertise. Therefore it cannot be ignored by education professionals.

**Changing conceptions of learning and expertise**

The ICT revolution and Internet have already changed the world in a profound way. Koponen mentions that during the past decade Internet has “emerged to evolve a new culture, the Internet culture, which has extended to all areas where microprocessor technology with wired and wireless communication technology has extended” (Koponen 2008; 13). He states that this culture has enabled the use of ICT also in teaching in a way that “extensively influences pedagogy, learning strategies and dispositions, as well as learning management both on micro and macro levels” (Koponen 2008; 13).
The most recent development within the Internet culture is the “Web 2.0”, social media applications and participatory economy. These applications have had a fundamental effect on people’s behaviour on the Internet. As the term suggests, social media refers to web services that receive most of their content from their users, building on social networks and on the creativity of the participants of the community (Lietsala & Sirkkunen 2008). An important characteristic of these applications is that in most cases no obligatory monetary incentives are involved – for most of the participants the opportunity for self-expression is enough. Lietsala & Sirkkunen make a distinction between different genres of social media: 1) content creation and publishing (e.g. blogs, video blogs and podcasts), 2) content sharing (e.g. YouTube, del.ici.ous, Flickr), 3) social network sites (e.g. Facebook, LinkedIn, MySpace), 4) collaborative production (e.g. OhmyNews, Wikipedia) and 5) virtual worlds (e.g. Second Life, Habbo Hotel, WoW). Some, of course, might fall into more than one category. (Lietsala & Sirkkunen 2008).

The impact of these applications on the conceptions of learning and expertise is groundbreaking, and not yet fully recognized and understood by the educational authorities. As Lietsala & Sirkkunen aptly point out, the great change is in the ownership of information, content and distribution:

In the old model sites were like countries that had strict rules about who could cross the country border, which of the people will have work permit, which commons are allowed to import and export, whereas social media has opened at least some of these borders to unchain the import and export of commons.

(Lietsala & Sirkkunen 2008; 15)

This applies to all kinds of information, including learning material, and has thus a profound effect on ownership of learning. The phenomenon can be illustrated by taking group work as an example. In a traditional learning context a group of students doing group work would search for information regarding the topic in sources recommended or given by the teacher; books, journals – nowadays also the Internet – write an article, a summary, or compose a poster or
a presentation based on the information, and simply give the paper to
teacher or, at best, give the presentation to the whole study group. A
month later the work will be forgotten. If we compare this situation
with a group work done with the help of a blog, wiki or another social
media application, there is one huge difference: the students search
information and write the group work, after which the work becomes a
source of information in its own right. Instead of writing a school task
the students create new information that will be published and can be
referred to any time by any one interested in the same topic. They can
comment on it or attach relevant videos and photos, share it in
Facebook or subscribe to it in Google Reader. The site can be linked
to and from other sites covering a similar topic. The writers have
transformed from audience to producers (or prod-users, in social
media jargon). The difference in ownership and the conception of
learning is revolutionary.

Many social media sites use groups, favourites, recommendations and
tags for facilitating information search. This has affected the way of
determining the relevance of a given information source. Instead of
the traditional authority-based system, the users themselves judge
information as being relevant or irrelevant. A source that has been
tagged very frequently is more likely to be trustworthy than one with
few or no tags. The same system works for entertainment (e.g. user
evaluation of movies in IMDB) and the academic (e.g. tags in
del.ici.ous, recommendations and professional groups in LinkedIn).

Both of the aforementioned characteristics of social media promote
the idea of distributed expertise and expert networks instead of the
traditional conception of expertise. The word ‘expert’ has at least the
following definitions:

**Expert:** someone with great skill in, or extensive knowledge of,
a particular subject.

(http://www.chambersharrap.co.uk)

An **expert** is someone widely recognized as a reliable source of
technique or skill whose faculty for judging or deciding rightly,
justly, or wisely is accorded authority and status by their peers
or the public in a specific well distinguished domain.

(http://en.wikipedia.org/wiki/Expert)
Traditionally experts have been seen as authorities, at least to some extent. They have been “widely recognized” as people with special skill and special access to a wide amount of information in a particular subject. This conception is changing as the surrounding world becomes increasingly complex and constantly evolving. Not only is it impossible to learn a given subject completely – due to a process of constant change there is always more to learn – but the complexity and interdependence of most subjects require a network of professionals instead of one specialist. Very often this network exists online. As Castells (2007) points out, communication and information have been fundamental sources of power and counter-power, domination and social change throughout history. The change in the ownership of information is therefore bound to result in a dramatic change in the conception of expertise. This can already be seen in the evolving working life skills increasingly valued in the economic life.

**Changing skill requirements**

The days are irreversibly over when young people graduated as experts and were considered to be comprehensively prepared for their newly acquired profession - which they then would practice for the entire duration of their career. The working life context has become increasingly complex and the problems to be solved are more ambiguous than ever before. It is essential to critically evaluate whether education – contents as well as working methods – prepares the students for the dynamic working life context.

*The explosive growth in the amount of immediately accessible information is also changing the nature of competence in many professions. The value of rote learning as part of professional competence has been diminished and replaced by skills related to acquiring new knowledge, perceiving and outlining large information entities, and intuitive application of those entities. A growing number of occupations are evolving into information professions in a sense that their core competences are connected with acquiring, managing, refining and sharing work related information.*

Nevalainen & Hannunen (2009)
A major change can also be seen in the manner of communication – not only meaning new communication tools but the entire philosophy of communication. The following table illustrates the passing and rising trends in working life requirements.

<table>
<thead>
<tr>
<th>Passing trends</th>
<th>Rising trends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly line work</td>
<td>Self-direction</td>
</tr>
<tr>
<td>Informing</td>
<td>Acquisition of information</td>
</tr>
<tr>
<td>Vertical management</td>
<td>Creation of information</td>
</tr>
<tr>
<td>Individual performance</td>
<td>Sharing of information</td>
</tr>
<tr>
<td>Working in isolation</td>
<td>Project work</td>
</tr>
<tr>
<td>Sitting on information</td>
<td>Independent teams</td>
</tr>
<tr>
<td></td>
<td>Internationality</td>
</tr>
<tr>
<td></td>
<td>Communities of practice</td>
</tr>
<tr>
<td></td>
<td><strong>Lifelong learning</strong></td>
</tr>
</tbody>
</table>

Table 1: trends in working life requirements. Hannunen & Nevalainen (2009)

Castells (2007) describes the fundamental difference between the old and the new communication systems by stating that the diffusion of Internet, mobile communication, digital media and social software has prompted and supported the development of horizontal networks of interactive communication, instead of the mass-media centered communication system of the industrial society, characterized by the mass distribution of one-way messages. Nevalainen & Hannunen (2009) also emphasize the impact of social media applications on the way organizations, and the work of their members, are organized. The effort of management is radically diminished; thanks to social technologies that support the communities in creating, managing and sharing information. According to Markkula & Sinko (2009), when considering the nature of learning it is essential to take into account the changing expert work that is increasingly organized through professional networks with the help of technologies that facilitate the collaboration between these communities. Nevalainen & Hannunen (2009) point out that “the coordination of collaboration in a community will be transformed from routine intellectual labor, requiring dedicated work roles, into a property of the intelligent social services and the organizations using them”. It must be admitted that
the traditional teaching methods and course management systems, such as lecturing and teacher-centered course structures, still represent the industrial society communication system and are therefore not contributing effectively to preparing the students for the professional challenges they face after graduation. There is also the danger that these old methods are creeping through to the new learning environments. When Lynch (2001) states that e-learning requires new thinking, this is undoubtedly a practical example where this new thinking should be applied.

**Learning environments of today and tomorrow**

The design of the auditorium and the traditional classroom is affected by the industrial society communication model described by Castells (2007). The teacher stands in the front, whereas the learners form an audience. The one-way message is distributed by one (teacher) to many (learners). Although questions and discussion might be invited, the sheer architecture of the learning environment smothers true dialogue and the creation of networked expertise.

**Virtual learning environments and learning management systems**

Virtual learning environments (VLE) or learning management systems (LMS) are the most commonly used tools for e-learning. There are various options available, most of them containing a similar set of tools, such as course management tools, communication tools (e-mail, instant messaging, discussion board), the possibility to distribute material in different formats and the possibility to share files. Although undoubtedly useful in many situations, VLEs and LMSs have recently started to face increasing criticism due to their tendency to reassert the old one-way communication system characteristic to conventional classroom education. The degree to which they are considered to do this might vary from one VLE to another. For example, some VLEs do not even enable student initiative in starting a discussion; some are heavily based on traditional course structure and do not easily allow collaborative exploratory learning approaches, whereas some are strongly text-based and encourage, for example, the overuse of PowerPoint presentations. Some researchers are already predicting the death of the VLE:
...is the VLE delivering what is needed in a world where flexibility of learning is paramount, and the lifelong learner is becoming a reality? There are indications that rather than resulting in innovation, the use of VLEs has become fixed in an orthodoxy based on traditional educational approaches.

Stiles, 2007

The critical discussion around the VLE evolves actively especially in blogs and other social forums. E.g. Dave Foord mentions in his blog (June 2008) that VLEs are often used as storage grounds and that “even good users of VLEs will find that the nature of them forces them into arranging learning content in linear lists.” The emergence of social media has accelerated the debate, and terms like “e-learning 2.0” - sometimes already even “e-learning 3.0” have come a part of e-learning bloggers' vocabulary. (e.g. Thalheimer 2006, Karrer 2006, Wheeler 2009).

eLearning in the future

Stephen Downes was the first to use the term eLearning 2.0 in 2005. He described the state eLearning was in at the time and remarked that it was mainly occurring in the form of online courses, conducted in learning management systems that organize learning material in a standard way, as a course divided into modules and lessons. Downes claims that this did not differ from the situation before e-learning: traditional theories of distance learning were simply adapted to the online world. (Downes 2005). However, Downes states that the nature of Internet and its users has begun to change significantly. He observes that these “…changes are sweeping across entire industries as a whole and are not unique to education; indeed, in many ways education has lagged behind some of these trends and is just beginning to feel their wake (Downes 2005).” His views are in accordance with the changing conceptions of learning and expertise discussed in section 2. He demands a learner-centered approach which is “…more than just adapting for different learning styles or allowing the user to change the font size and background color; it is the placing of the control of learning itself into the hands of the learner (Downes 2005). He sees e-learning 2.0 as a natural result of Web 2.0, in which VLEs and LMSs no longer play a central role:
What happens when online learning ceases to be like a medium, and becomes more like a platform? What happens when online learning software ceases to be a type of content-consumption tool, where learning is "delivered," and becomes more like a content-authoring tool, where learning is created? The model of e-learning as being a type of content, produced by publishers, organized and structured into courses, and consumed by students, is turned on its head.

(Downes 2005)

Sadly, four years after Downes’ manifesto, it seems that education is still largely lagging behind the trends strongly present in other areas of society. As Nevalainen & Hannunen (2009) point out, social networks simply do not support a top-down approach to collaboration management. Downes (2005) criticizes the collaboration in LMS/VLE discussion boards as often being artificial and teacher-led, and Nevalainen & Hannunen (2009) agree with him. They remind us that unless teachers are able to change their behaviour to suit the horizontal communication model of social networks, they might end up being the only participant in their learning community.

**Designing the online module**

With the clear and urgent need of profound education-related discussion in mind, an international online module was designed within the MOTIVATE project. The aim was to provide teacher students in Europe insight to these developments as well as offering them a forum for networking, sharing ideas and collaborating. The learning environment Moodle was chosen as the platform for the implementation due to its familiarity to the target group and easy availability in the participating universities. However, the top-down approach was to be avoided and more genuine collaboration was to be promoted. The aim was to introduce the teacher students to a diverse set of online tools, both traditional ones and newer social software applications, introduce articles and presentations on relevant pedagogical topics to arouse discussion, and stimulate critical thinking and collaboration with various learning activities. The approach was largely based on constructivist learning theory, including collaborative
knowledge construction and striving for authentic learning. The aim of the module was to spread awareness on the themes discussed earlier in this article and provide an opportunity to reflect, learn from others, form and share opinions, and collaborate across country borders.

Although the online module introduces several web-based tools that can be used for educational purposes, the idea of the module is not to teach the students the use of technical applications. The tools are introduced in order to illustrate the development from both technological and social point of view and give examples on the concrete outcomes of the Web 2.0 era. The list of the tools is by no means a comprehensive one, nor is the usefulness of any given tool for education judged. The purpose is to keep the use of the tools tightly connected to pedagogical considerations and simultaneously encourage creative thinking. The module does not suggest that a teacher should command and use all of the tools – or any of those exact ones. Instead, the out-of-the-box thinking and choice of the right tools for the right purpose are emphasized. Moreover, the aim is to concretize the change and the need for teacher's lifelong learning and the ability to creatively rethink one's actions and methods when needed.

The module was divided into four sub-modules, each of which consists of three main elements: 1) pedagogical considerations, 2) introduction to a set of online tools and 3) collaborative learning tasks. The introduction to the tools proceeded from the most familiar ones through newer social media applications to applications that are likely to become widespread in near future, such as mobile learning and personal, non-institutional learning environments. The teacher's role was to provide new viewpoints, participate in the discussion and share her own experiences in e-learning. However, the discussion was not strongly directed or restricted to a given topic. The learners were given questions to ponder, but the way they worked with the questions was not limited. This way the communication did not become one-way messaging; instead, the students were extremely active in initiating new discussion topics related to the themes.
Applying the principles of meaningful e-learning

In the design of the course, the principles of meaningful e-learning introduced by Jonassen et al. (1999) were applied. The criteria are based on constructivist learning theory, the central idea being that meaningful learning requires knowledge to be constructed by the learner, not transmitted from the teacher to the student. Earlier experience has proven that they provide a useful framework for contributing to a motivating learning experience and successful achievement of learning goals. According to Jonassen et al. (1999) learning environments should keep students 1) active, 2) constructive, 3) intentional, 4) collaborative, 5) complex, 6) conversational, 7) contextualized and 8) reflective. The figure below illustrates the interdependence of the criteria.

Image 1: A model for meaningful learning

In the following the criteria as well as the way they were applied in the online module are discussed in further detail.

Activeness means that the student is in a key role in her own learning. She is actively engaged in the learning process, processing information. Activeness leads to students taking responsibility in their learning. This is in accordance with the attempt to move towards a
more authentic learning process and avoiding teacher-led one-way communication and strict direction. Activeness was promoted by encouraging the students to introduce new topics for discussion. This goal was very well met during the learning process.

*Constructiveness* refers to the process in which the student integrates the new information with her prior knowledge in order to make sense of the content. Students were invited to share their experiences and prior knowledge with the group in various discussions that formed an elemental part of the studies. This also took place very actively.

*Collaboration* comes from the students’ natural tendency to form communities in which the members can benefit from each others’ skills and social support. This aspect was very naturally realized in the studies through the international networking and active dialogue.

*Intentionality* refers to the learners’ active attempts to achieve a cognitive goal. Striving to reach the goal makes the learner think – and thus also learn – more. The students were invited to actively form the goals and reflect on them with the help of the first discussion topic: the students were asked to describe their current situation regarding e-learning and online tools. They were asked to consider the pedagogical value of the tools they use and reflect on their impact on their professional identity and work as teachers. Furthermore, they were asked to imagine the situation five years from now regarding the use of educational technology, the reasons behind the possible changes and the effect of this in their work.

By *complexity* Jonassen et.al. mean avoiding oversimplification of problems. They believe that the students need to be engaged in solving complex and ill-structured problems, otherwise their view of the world is in danger of becoming over-simplified and they remain in a lower level of thinking. To make this happen, the students were given tasks that require complex thinking, reasoning, combining of phenomena and reflection. E.g. instead of merely asking students to familiarize themselves with a given social media application, they were also given scientific articles on meaningful learning and asked to consider in the light of the articles what additional value the application in question could bring to e-learning from a (socio)constructivist point of view. The students were encouraged to think of practical ways to
apply them in teaching and justify the meaningfulness of their ideas referring to the theories. As this was done in a discussion forum instead of a written report to the teacher, the students were able to benefit from everyone else's ideas, their view of the matter was broadened, and genuine networked collaboration was realized instead of a hierarchical, teacher-led approach. The working methods also brought authenticity to the learning situation as the student contribution was a shared expert viewpoint instead of a studying assignment.

**Context** refers to teaching knowledge and skills in real life instead of abstracting ideas in rules that need to be memorized. Jonassen et.al. point out that this method leads not only to better understanding, but also to more consistent transfer into real-life situations. This principle was applied throughout the course by constantly combining all theories, tools and tasks in actual teaching contexts. Again, sharing these with others was more fruitful than merely submitting assignments to the teacher.

**Conversation** takes place when students become members of a knowledge-building community and seek for ideas and opinions from each other. As a result of this process the students learn multiple ways of viewing the world and solving problems. As already pointed out, this aspect was very strongly promoted throughout the learning process by avoiding conventional assignments submitted to the teacher and preferring collaborative activities and discussion instead.

In **reflection** the students articulate what they have learned and reflect on the processes. By doing this they will understand more and become more capable of using the knowledge that they have constructed in new situations. Reflection was embedded in all the learning tasks and it was further encouraged by the teacher in her contribution to the discussions. According to Piaget's adaptation theory, knowledge construction tightly involves reflection, and this process is strongly enhanced by social interaction. This is discussed in more detail in the next section.
Collaborative knowledge construction

The design and the approach of the module were also supported by Piaget’s adaptation theory and his ideas regarding the significance of social interaction in knowledge construction. According to Piaget, knowledge construction takes place through assimilation and accommodation, the two complementary processes of adaptation. In assimilation, new information is adapted to the existing knowledge structure of the learner. Sometimes, however, the new information is contradictory, and does not seem to fit in the old knowledge structure. This leads to a cognitive conflict. In such cases the knowledge structure must accommodate itself to the new evidence and adapt to it. This process involves reflection, i.e. testing “what if” assumptions in order to find an explanation to the new perceptions. (Piaget, 1985, Von Glasersfeld, 1997).

Piaget believes that social interaction activates individual thinking processes. He sees peer interaction as an especially effective tool for this as it creates cognitive conflicts. Relying on each others’ feedback and interaction, learners work as a part of the mutual construction process. Not only is the experience shared, but the meaning of the experience becomes the product of joint construction (Youniss & Damon, 1992).

Sagan (1980, in Bielaczyc & Collins 2006) describes the early development of modern science among the Ionians who formed one of the first knowledge-constructing communities. Sagan sees three key characteristics in the Ionian society that enabled this development: 1) freedom and encouragement to inquire; 2) conflict of cultural perspectives and 3) using writing as a tool for thinking (In Bielaczyc & Collins 2006, p. 39). These characteristics can be found in the knowledge-constructing community of teacher students in the online module. Based on constructivist principles and dialogue, the studying methods required active question-setting. The discussion topics were not restricted and the students were encouraged to ask questions and comment freely. Moreover, the diverse background of the students (different cultural backgrounds, varying age, different countries) brought a variety of viewpoints to the discussions – not to mention the elemental role of writing as a tool for thinking and reflecting in online
discussion forums. As Bielaczyc & Collins (2006) mention, an online discussion forum offers a space where ideas are visible for everyone and available for discussion and improvement. Thus a social context is formed, where, according to Glaser (1991, in Von Wright 1992), the thinking processes of the learners are displayed, enabling individual as well as collaborative reflection. Therefore, when it comes to pedagogical value, promoting social interaction and collaborative activities can be argued to surpass individual written assignments in e-learning.

**Implementing the online module**

The module was implemented at TAMK University of Applied Sciences in Tampere, Finland, and the students of the module consisted of teacher students from Hungary, England and Finland. The online module was delivered to the teacher students of the different universities simultaneously during the autumn term 2008. The Finnish students did not have any face-to-face meetings. The Hungarian and the English students completed the module applying the blended learning approach, in which the online activities were supported by face-to-face teaching. The local teachers in Hungary and England were responsible for the face-to-face tuition and the evaluation of their students, whereas a Finnish teacher was responsible for the online teaching, guidance and evaluation as well as giving feedback on the final project.

**The course of the studies**

Altogether 23 students participated in the online module. Most of the students started participating actively in the online environment from the very beginning. The majority of the ones who were quiet in the beginning also became active quite soon, and there were only 5 drop-outs. The local teachers also participated in the discussions of the module and monitored the activities.

The activeness of the students can be illustrated with the amount of discussions and discussion entries. Already the first discussion (topic described in section 4.1.) resulted in 11 discussion topics introduced by the students, with 94 entries in total. The first unit introduced the concept of collaborative learning and discussed the benefits and
disadvantages of synchronous and asynchronous learning. The tools discussed in the first unit were the most familiar ones, such as e-mail, discussion forums and VLEs. The learning tasks concerned e-learning tools now and in the future, and comparison of synchronous and asynchronous communication methods.

The second unit delved deeper into the changing conceptions of learning and expertise by providing articles on progressive inquiry, collaborative knowledge construction and expert communities. A video recording on a talk on schools and creativity was also introduced. The online tools presented included blogs, podcasts and screencasts, as well as wikis. The learning task introduced collaborative writing in small groups, using the Moodle wiki and group discussion boards and chat rooms as working tools. The topic was to consider the changes in the conceptions of knowledge and learning that are taking place in the information society. Unfortunately the wiki tool of Moodle did not function properly and many of the students were experiencing technical difficulties. The integration of social media tools in VLEs does not always succeed as seamlessly as required. The solution was to move the activity to the discussion boards as the schedule did not allow employing a VLE-independent web-based application instead. This will, however, be done in the next implementation of the module.

The theoretical topics for the third unit included considerations on constructivism, instructional design and technology, meaningful learning and narratives in adult education. The tools introduced were Facebook, YouTube, Flickr, Del.ici.ous, Second Life and VoiceThread. The students were asked to choose two social media application with which they were not familiar, and explore them. The students were advised that the applications introduced on the module were merely examples of the numerous applications available, and they were asked to choose any two they were interested in. Many of the applications on the list and outside it had already been discussed earlier, as the students had introduced discussion topics of their interest. After exploring the social media applications the students were asked to reflect on their added pedagogical value on e-learning from a constructivist point of view and their usefulness in narrative approach, referring to the articles provided.
The fourth unit functioned as a peek into the future of e-learning. The themes and tools introduced ePortfolios, mobile learning, ubiquitous learning, Google applications and Personal Learning Environments (PLE). The key idea of the unit was lifelong learning, and the necessity of a teacher to apply it in her work. Therefore the students were provided with links for e-learning resources, useful blogs and information portals. The learning tasks included a discussion on the future of e-learning and the teacher's work, and a final project. The final project was the only assignment submitted to the teacher during the module. The purpose of the final project was to analyze the impact of the tools and theories introduced during the course in one's own teaching and make a course plan including pedagogically relevant use of e-learning tools.

The key idea in the final project was to activate critical thinking and reflection as well as to encourage the students not to use online tools merely for novelty's sake but instead keep the pedagogical quality as a priority.

Feedback was collected from the participants after completion of the module. The feedback was extremely positive. With the scale 0-5, ‘collaboration with the teacher and other students’ did not get evaluations below 4. The opportunity to share experiences and collaborate with other students was considered the most positive aspect of the course. Also working in English and collaborating with students from another country were highly appreciated. The students' overall attitude towards e-learning was very positive.

**Student views on the changing teacher**

The discussion posts of the students provide valuable insight on how future teachers observe the current development in the society and in what way they imagine it to become visible in the field of education. The first discussion, concerning the e-learning tools now and in the future, is very revealing in this respect.

The discussion posts indicate that in most cases the students were familiar with VLEs and many of them used or had used them either in their own work or as students. Some had used web-conferencing systems. Most of the students had used some social media applications, such as Facebook and YouTube, but not for educational
purposes. An interesting feature in the students’ future predictions was the prominence of the VLE as the central element. Some believed the technical development would slow down and VLEs would be used less in the future. Others thought VLEs would probably be used more widely, especially if more interaction elements would become integrated in them. Teachers’ technical skills and insufficient infrastructure (bandwidth, equipment) were seen as major challenges for a more wide-scale implementation of VLE usage in universities. Some of the participants were concerned that the more extensive usage of the VLE would have a negative impact on social relations and interaction as well as on the learners’ physical health.

Should the teacher change and why?

As the title of this article suggests, the key question is change. Should the teacher change to adapt to the changing society and changing skill requirements that are placed upon the graduating students from the outside world? The discussion posts illustrate the views of the teacher students regarding this question.

Quite surprisingly, one of the main advantages of using web-based tools in education was considered to be their positive impact on learner motivation. The view seemed to be that young learners would find it more fun to study with online tools than by classroom education, and teachers should therefore provide them with this opportunity. As one of the students believed, “we have to use the same language, i.e. tools and methods, which young people are familiar with in order to catch their attention and keep them motivated.” There clearly is a group of teachers-to-be who do believe that a change is needed, but that it is in some cases done rather reluctantly, in order to motivate and please the younger generation learners who are accepting a certain level of modernity from the teaching methods. In this case the need for change is possibly seen in a somewhat superficial way. Instead of a paradigm shift the change remains in the level of learning to use new tools.

There were also students who did not think any major change would be needed. Some stated that they could not see themselves using any of the introduced applications in their teaching, because they did not find them relevant for educational purposes. This group of people argued – as a response to the ones emphasizing fun and motivation –
that learning does not have to be fun, it is supposed to be educational. They were not willing to change the way they perceived the teacher's role and formal education as they could not see any reason to do so.

However, some students saw the changes in the society in a profound way and predicted that the future of learning would have to be different from what it is now. One of the students wrote that “the future of learning is informal and mobile”. These types of views reflect the changes occurring outside the school, in the surrounding reality.

**Conclusions**

It seems obvious that the technological and social development in the society and the changing working environment and skill requirements cannot remain unnoticed and ignored by educational professionals. The change taking place is significantly deeper than simply an introduction of new tools; it is a paradigm shift that is bound to have a profound impact on the conception of learning and expertise. Therefore it is essential for teachers, educational designers and authorities to critically examine whether the current teaching methods, instructional design and learning environments are adequate for the needs of the 21st century education.

The online module described in this article was designed to meet this need. In order to encourage genuine discussion and distributed expertise, the approach of the module was in accordance with the horizontal and networked communication model characteristic for the Web 2.0 era. The experiences gained from the implementation support the view that this type of studying and collaboration opportunity is very useful and needed. The feedback of the module was extremely positive; especially collaboration with other students and the teacher and the international aspect were considered useful and mind-broadening.

The way the participants of the module perceive the change and the challenges faced by education in the evolving society also proves that a module of this type is very much needed in teacher education. Whereas many of the students were well aware of the changing society and were willing and prepared to develop education towards the evolving skill requirements, there were also students who either
did not see beyond the technical development and thus could not see a major impact on education, or saw a need for a superficial change in order to appear more modern in the eyes of the young learners.

Education has been lagging behind the changes sweeping throughout all sectors of the society. The model for communication, the concept of expertise, the ownership of information and content - indeed the entire way people and organizations function - is experiencing a fundamental change, putting a demanding challenge on educational systems and practices. Although all teachers must recognize this, it is clear that teacher education and the graduating teachers are in a key role in answering the challenge. It is crucial that the future teachers are provided with an opportunity to reflect and collaborate on these issues already during their studying time. It is an effective way of preparing for the change, harnessing creativity to educational development and reducing the anxiety that the evolving, increasingly complex and ambiguous operating environment might cause. The students change inevitably, and teachers may no longer build upon their own school history as a model of what studying is like. Teacher education must therefore play a central part in answering to the challenge.

Resources


From Traditional Lecturer to Blended Tutor: a Case Study Exploring one Tutor’s Successful Transition
(Andrew Youde)

Introduction
The common module delivery of the Motivate project required tutors from the participating partner institutions to operate in ‘blended’ learning environments, and to engage in CMC (Computer Mediated Communications) activities. Tutors, generally, in all fields of higher education, are increasingly being asked to perform their teaching duties in on-line contexts, and frequently this is a role which is undertaken with little experience and training. Whilst some tutors adapt their pedagogy and embrace the challenges this brings, others struggle to engage with both the technology and the students. This case study concerns one tutor employed by the UK partner institution in the Motivate project, and explores her successful transition from ‘traditional lecturer’ to blended tutor. Through an in-depth interview and student feedback, the strengths of the tutor were examined together with the challenges faced in becoming an award winning tutor. Related experience, a commitment to continuous professional development and an understanding of pedagogy were found to be important aspects of the tutor’s skill set and attributes. Peer-coaching occurred whilst the tutor was supporting learners with technical expertise available on request. These factors could help identify elements of training for successful blended tutors in the future.

Background
Over 40% of UK university students attend part-time. They have been central to the UK Government’s strategy for increasing participation in higher education (HE). Their growth has been linked to the widening participation agenda with female, mature and working-class learners choosing this option as they often require flexibility of study or can’t afford to be full time. Part-time students are choosing HE for career-enhancing reasons with many enrolling on vocationally
relevant courses. The changing demographics of UK HE are bringing new challenges to university lecturers. Increasingly, universities are developing delivery modes to meet the needs of this group of learners. There is a greater use of online learning and tutoring together with blended delivery patterns. University lecturers’ roles are changing to meet the challenges of blended learning and the adaption of their pedagogy can be difficult. Training is often sparse resulting in negative experiences for both tutor and student. This study explores one tutor’s successful transition from a traditional lecturer to blended tutor. A range of factors are considered including practical skills, personal qualities and previous experiences and conclusions are drawn that should aid the training of tutors in the future. As Wheeler notes, “the future success of blended learning will rely heavily on technology-mediated communication, but even more on the skills and knowledge of responsive tutors” (Wheeler, 2007, p.116).

The study, based at the University of Huddersfield in the UK, focuses on blended learning programmes for adult learners in part-time education. Adult learners in this context tend to be able students who have often not studied in a formal educational environment for some time. Creanor (2002) outlines the difficulties of tutoring adult learners particularly regarding the influence of daily events within their lives together with the pressures and time constraints of work. It is important to train tutors to develop empathy for their situation and who can manage their learning needs. However, adults tend to have a greater understanding of what they want to achieve from education and have clearer goals in mind (Richardson et al, 2003; Biesta, 2005). Increased age encourages more deep and strategic approaches to learning and less reliance on surface approaches (Biggs, 1987). Tutors need to be aware of these influences and factors when developing and delivering courses.

Skills, Qualities and Attributes of Blended Tutors

The debate about good teaching and tutoring is widespread and diverse but one commonly reoccurring theme arises, namely that it is context specific. To explore the blended tutoring context, literature discussing traditional lecturing, distance education and online tutoring has been reviewed. Each area outlines pertinent aspects that blended tutors should embody and each will be discussed in turn.
General factors about the qualities of traditional lecturers have been extensively debated and a core of qualities has been identified that are generally accepted. These include:

- an understanding of student learning;
- the use of appropriate teaching and learning methods;
- the use of appropriate assessment methods;
- feedback on student work and monitoring their progress;
- reflection on practice;
- a commitment to continuing professional development;
- to be organised;
- the ability to work within available resources.

It seems perfectly reasonable to expect a blended tutor to demonstrate these qualities and these are developed further as distance and online factors are considered.

Within distance education the personal qualities of tutors, and their relationship with students, have been highlighted as important for success. Holmberg (1989) explains that tutors require empathy for the learning journey students are undertaking. This can encourage students to feel connected to the institution and develop a rapport with their tutor. Moore (1997) developed this view by outlining the notion of transactional presence; the connectedness a student feels to their tutor. The distance between the tutor and student is unimportant if there is open communication between them. Open dialogue and appropriate communication media can foster transactional presence however tutor facilitation is required. Within online contexts the personal qualities and student/tutor relationships are equally important. Sherratt (2008) explored both tutors’ and students’ perceptions of the tutor in blended learning environments. The focus was on tutors’ contributions within asynchronous discussion boards and found that students valued ‘visibility’ by tutors, which helped to maintain trust.

With the rise of Web 2.0 technologies, those that allow increased communication and interaction in online environments, there has been a growing body of literature developing their use in education. The
facilitation of students in these environments is becoming central to the role of online and blended tutors (Laurillard, 2002; Salmon, 2003). Barker (2002) outlines the human element of the online tutor, which is of central importance in developing online communities coupled with encouraging interactions between students in online environments. Tutors should encourage students to learn from each other, appreciating alternative perspectives within different contexts. The tutor should oversee the debate; however, it can require intervention such as linking similar viewpoints and relating theory to practice. Facilitating online debate involves an appreciation of difficulties when communicating via predominantly text-based media. Tutors do not have the benefit of non-verbal feedback such as body language, and, as such, have less information to respond appropriately. Interpreting and responding to emotional signals in text-based media is an important aspect of the attributes of an online tutor. When used correctly, text-based communications can have a profoundly motivating effect on students.

As with traditional lecturers, online tutors have to manage learners (Minton, 2003) and deal with a range of competing pressures. The design of pedagogically appropriate learning resources is important and particularly challenging in online environments. A course should be structured to prevent students becoming over-burdened. Heavy workloads and excessive course materials encourage surface approaches to student learning (Gibbs, 1992). Students must know what is expected of them and have clear goals and standards to follow (Ramsden, 1991). Smith (2004) outlines that both academic and personal capabilities are required by the tutor for quality distance support of students and grouped the qualities and skills required of online tutors into two categories:

- Providing appropriate feedback;
- Being enthusiastic about providing support.

(Smith, 2004, p. 34).

Whilst student workloads impact on the quality of learning, tutors must also be able to manage their time. Creanor (2002) outlines the competing demands of online tutors as they try to encourage student participation. This is coupled with the pressures of quick responses to
general queries and assignment work, both of which are valued by students (Smith, 2004).

Tutoring in blended environments requires a certain level of competency with basic educational technologies. E-mail use is so proliferate in today’s society that it is an essential part of the tutor’s toolkit and supports administrative, pedagogic and motivational activities. Wheeler (2007) explained that e-mail facilitates the highest level of immediacy and is therefore an important technology for tutors within blended learning environments. Barker (2002) advocates tutors should be competent in using asynchronous conferences and chat, both from a practical and pedagogical perspective. More practical skills posited are word-processing skills, both to create course materials and to electronically mark work, web authoring skills including the development of hyperlinked documents, and finally the ability to use a course management system. The above form a basic skill set for a blended tutor but the emergence of web 2.0 technologies have expanded the range of resources available. Blogs to aid reflection, wikis to foster collaboration, e-portfolios to promote self and peer-assessment are examples of such resources.

Within distance and online contexts the students are in greater control of their learning and tutors need to adapt their approach and move towards being facilitators of learning. Within this context there is a greater emphasis on flexibility and adaptability for tutors. Students may not have the necessary skills to complete the course therefore requiring increased intervention on the part of the tutor. It would be difficult to argue against the importance of experience when tutoring online and Bennett and Marsh (2002, p.18) noted that as online tutors develop they grow “in awareness and confidence about working within an environment that supports independent learning.” They advise that whilst training is important, tutors should be quickly placed in a practical context to develop both practical and pedagogic skills. A mentor will help the development of the tutor; however, a reflective approach and a commitment to continuous professional development will aid the transition into blended tutoring contexts.

The importance of the role of the tutor in facilitating a successful blended learning experience cannot be underestimated. All the skills that lecturers in traditional classroom environments possess are essential for a blended tutor; however, they do not have the benefit of
lengthy face to face contact. Therefore, a heightened knowledge of pedagogical principles and empathetic consideration of the students’ learning environment will help the tutor be successful.

**Methodology**

The main method of research for this case study was an in-depth interview with the tutor under investigation. This determined the tutor’s background and relevant teaching experience whilst exploring the factors that have led to success. Notions of good blended tutoring informed the development of the interview schedule as well as consideration of other factors that can influence a tutor's impact. As part of the interview an analysis of the tutor’s teaching style was undertaken drawing on both Kember’s (1997) and Pratt’s (2002) conceptions. Kember’s five conceptions are:

1. Teaching as imparting information;
2. Teaching as transmitting structured knowledge;
3. Teaching as an interaction between the teacher and student;
4. Teaching as facilitating understanding on the part of the student;
5. Teaching as bringing about conceptual change and intellectual development in the student.

To strengthen the validity of the analysis, a comparison was made to Pratt’s conceptions, which are:

1. Transmission – effective teaching requires a substantial commitment to the content or subject matter;
2. Apprenticeship – effective teaching is a process of enculturating students into a set of social norms and ways of working;
3. Developmental – Effective teaching must be planned and conducted “from the learner’s point of view”;

46
4. Nurturing – Effective teaching assumes that long-term, hard, persistent effort to achieve comes from the heart, as well as the head;

5. Social Reform – Effective teaching seeks to changes society in substantive ways.

To complement the tutor interview, a group of students (n = 10) completed a questionnaire which explored their perceptions of their tutor. This was the student’s first experience of higher education and blended learning; however, they had been taught by the tutor for four years so a detailed knowledge of her approach was understood. The group were all female, high achieving and motivated to succeed. Their ages ranged from 25 to 54 and they categorised themselves as either moderate or experienced users of basic educational technologies (e-mail, word processing, discussion boards and web site navigation). The research was carried out after the first module of the BA (Hons) was completed. The course is delivered on a part-time basis with a blended delivery model where students attend six day schools throughout the academic year. There are supplementary online resources, exercises and assessments with opportunities for peer interaction and tutor support.

The student questionnaire was designed to cover three broad areas; general opinion about the quality of tutoring and the course; more specific questions around the quality of online tutoring; and, consideration of the students’ approach to their studies. To obtain general opinion about the quality of tutoring and the course, a modified version of the Course Experience Questionnaire (CEQ) was used (Ramsden, 1991). The CEQ was designed as an indicator of teacher effectiveness on courses in higher education institutions and draws on students’ perceptions of their curriculum, assessment and instruction. As the CEQ was originally designed for courses with traditional approaches to teaching, it has been modified to make it suitable for an individual tutor and a blended teaching model (see Richardson and Woodley, 2001, and Kreber, 2003, for similar use of the CEQ). The scale items adopted were good teaching (split into ‘classroom teaching’ and ‘feedback on, and concern for, student learning’); clear goals and standards; appropriate workload; and appropriate assessment. To explore the quality of online tutoring
questions were formulated from the literature review. The scale items adopted were communication in online environments; management of learners; and technical skills in using educational technologies. Further questions were added to explore emotional aspects of the student/tutor relationship and included empathy, interpersonal skills and transactional presence. Biggs et al. (2001) Revised Study Process Questionnaire (R-SPQ) was chosen to evaluate students’ approaches and motivation towards their study. The R-SPQ is designed for full-time students and for courses with examinations as the main method of assessment. The questionnaire has been amended to make it more suitable for adult learners on blended learning courses. A focus group was undertaken to clarify issues raised in the questionnaire.

**Tutor Background**

The tutor has lectured at the University for five years and prior to this had no experience of teaching in online and blended environments. Whilst at University she has received outstanding results on blended learning courses which have been endorsed by internal and external quality review processes. Student feedback has been equally impressive and consistently high over this time. Her students have nominated her for the University’s Extra Mile Award for outstanding student support, for which a letter of commendation was awarded. Recently, she was awarded the ‘Tutor of the Year’ award by a regional body that promotes improved vocational and work-based progression of young people and adults into higher education. This study aims to evaluate how someone with such little experience of blended learning can become so successful in such a short period of time.

The tutor has over twenty years of experience with a variety of learners in the post-compulsory sector. Her current role is Senior Lecturer and Course Leader for a part-time Foundation Degree and an articulated BA (Hons) progression route. As well as these programmes other teaching includes a Masters degree in Professional Development, Subject Specialist teaching for in-service trainee teachers, and another similar foundation degree. Previous to this she was course leader for a range of vocational programmes at a sixth-form college, mainly teaching advanced level modules. She lectured
at the college for 11 years and other roles included extensive personal tutoring and teaching a range of levels including pre-GCSE and foundation. Her first teaching experience was in a variety of further education (FE) colleges on a part-time basis teaching vocational work-related programmes. A PGCE (Post-Graduate Certificate of Education) was completed during this time.

The tutor has not studied on blended or online programmes; however, her first degree may have helped in her current role. The tutor studied part-time over five years to achieve her BA (Hons) degree whilst working as a child minder. Whilst the degree was not vocationally relevant to her work it did provide an understanding of the difficulties of studying on top of full time employment. Whilst working at University a part-time Masters degree has been achieved; this qualification was relevant to her role however it did not involve studying online.

Discussion

An analysis of the tutor’s previous experiences, online tutoring and management of learners and student relationships has been undertaken to determine which factors have resulted in success.

The tutor dispels the myth that expert technical skills are required by using simple and accessible technology effectively. Whilst feeling her technical skills are weak, this is not what is perceived by the students. They outline a competent use of all the technologies used as part of the course. Word processing is used for document presentation and supporting formative assessment with use of the reviewing feature. E-mail facilitates this process as well as supporting administrative aspects of the course. Software that converts word-processed documents to web-pages is used to develop online resources that include some interactive elements. These online resources are held on the University’s Virtual Learning Environment (VLE) with the discussion boards and online student tracking features regularly used. The students’ vocation involves computer work, particularly word processing and e-mail, so they are naturally comfortable with their use. The tutor’s perception that her technical skills are weak may have come from her limited training and working with colleagues who are stronger in that area. The only formal training undertaken has
been e-mail folder and file management. Support from more experienced colleagues has been actively sought in what could be described as a ‘peer coaching’ role. The tutor’s willingness to seek help, plus the informal support with the University, has seen her skills quickly develop. Upon starting at the University she immediately taught on blended programmes and she clearly endorsed Bennett and Marsh’s (2002) view to be placed in context as quickly as possible to develop practical and pedagogic skills.

The tutor is an effective manager of learning and provides a high level of support for students; factors that were enthusiastically supported by students. When assessing the tutor’s teaching style, supporting learners was the preferred style although the style did change throughout the duration of the course. Examining Kember’s (1997) conceptions of teaching styles, ‘teaching as facilitating understanding’ was dominant. This was validated with the choice of Pratt’s (2002) ‘development’ style; however, some elements of transmission were highlighted at the start of the course and when introducing assessments. Students know what is expected of them and feel comfortable approaching the tutor if they were unsure. Feedback from the CEQ shows high scores in classroom teaching; feedback on, concern for, student learning; and clear goals and standards. When questioned about her success, the tutor felt it was down to ‘being old fashioned about teaching, setting objectives and achieving them’. It was apparent however that most of the aspects of the role that the tutor felt were good practice were more concerned with student support rather than teaching. Detailed strategies for supporting and monitoring students were outlined which included observing contributions and body language at day schools; using the VLE student tracking facility; discussion board monitoring; extensive use of formative assessment; and telephone and personal tutorials to follow through any issues. On top of this commitment for student support the tutor spoke with real enthusiasm and passion when discussing the various strategies.

Although the tutor is an effective manager of learning, the level of student support delivered would have an impact on her overall workload. When questioned, the tutor feels pressurised with the competing demands of teaching on a range of courses whilst effectively supporting blended learners. Careful planning is undertaken around teaching with time allocated each week for online
support. This organised approach and the ability to plan ahead allows the tutor to maintain the level of student support whilst undertaking her other responsibilities.

The level of student support was one of a number of factors that developed strong student/tutor relationships. Again, students were very supportive regarding perceived empathy, interpersonal skills and transactional presence. The tutor’s first degree, undertaken as a distance learner whilst in full-time employment, provides a natural source of empathy. She spoke about the difficulties of being an independent learner, feelings of isolation, and felt other students were performing better and not experiencing the difficulties she was facing. This period of education helped shape the level and commitment to students and facilitates relationships to form based on apparent mutual trust. The level of trust is supported by the tutor’s commitment to high standards and she spoke passionately when stating ‘I meet all my deadlines and if I say I’m going to do something, I do it’. Strategies to form relationships start as students are enquiring about the course and followed through to the start of teaching. Regular e-mail contact is maintained and from the replies, the tutor develops a feel for the students and their potential needs. Lack of confidence is a frequent issue amongst the students and to monitor and develop this, increased communication levels are used at the start of the course. The distance between the tutor and students clearly wasn’t a barrier and there was a developed transactional presence. This was apparent when the tutor outlined that she would visit students who were having particular difficulties in their workplace. She commented that ‘this was valued by students and gave them a sense of importance; it made them feel like they mattered to you’. The student questionnaire revealed that they felt they knew their tutor, they had developed a rapport and that the tutor would willingly help them if required.

Whilst students communicate with each other online, learning appears to occur both at day schools and independently. Students felt the tutor encouraged online discussion around the subject content; however, an online learning community has not developed. The day schools provide the majority of the teaching on the course with a variety of pedagogic approaches utilised to foster understanding of key concepts. Emphasis is also given to assessment requirements which the tutor believes is an important motivational aspect. This provides a structure for the students to follow between the taught sessions with online
systems providing support if needed. Discussion boards facilitate this, particularly for formative assessments with students using the medium for socialisation and information exchange (Salmon, 2003). The tutor only replies to contributions for assessment purposes or if a student had posted a question to which there was no reply. The motive for this was concern for the students’ feelings; not primarily to develop their understanding of the subject. It has been argued that facilitation of students in online environments is central to the role of online tutors; however, in blended contexts with adult learners, the technology can be used to support independent learning. The tutor is basically supporting distance learning and not developing online learning; however, is using educational technology to improve communication with, and between, students. Whilst learning communities are not being developed in online environments the tutor encourages their development at day schools. A range of activities were outlined that encouraged students to collaborate with the students indicating they naturally formed their own support groups.

It is clear the tutor had a lot of relevant experience that has facilitated the transition to blended tutor. The number of years in various roles provided a detailed understanding of teaching and learning. This is coupled with experience of tutoring adults studying work-related qualifications on a part-time basis. The extensive personal tutoring role, to a variety of learners, will have helped support more independent approaches to learning. Completing her first degree on a part-time basis has directly impacted and benefited the teaching approach adopted. However, it would appear that the tutor teaching style and the student characteristics are complimentary. Completion of the R-SPQ revealed a high proportion of deep motive and deep strategy learners amongst the students. The provision of strong support mechanisms is valuable for this type of learner, particularly those who have been out of formal education for some time. Whilst the tutor had the benefit of teaching such motivated learners, this is a symbiotic relationship and her part in the students’ development is not inconsiderable. The students however, had some transferable skills that are required on a blended degree course. Competence with basic educational technologies and a vocation that requires organisation and good literacy skills are relevant examples. One issue worthy of further investigation is gender implications; the tutor and all the students were female. Would the same success have been achieved
with a male tutor with a similar background or with a mixed gendered group?

**Conclusion**

The study aimed to explore the factors underpinning a successful transition from traditional lecturing to blended tutoring. Additionally, factors that could contribute to the future training of blended tutors were hoped to be established. Bennett and Marsh (2002) stress the importance for online tutors of not only course material design but also teaching style and pedagogy. The tutor has drawn on her previous experiences, applied it to a blended context, and has achieved this. Technical skills are not as important as good pedagogy; however, there must be a commitment to continuous professional development by the tutor. The nature of training is interesting; the context supports learning whilst undertaking the role. The time to respond allowed by asynchronous technologies enables tutors to seek help. This however, requires an experienced mentor and technical support to be available. Educational organisations should consider matching tutor background and experiences to those of their students. This will encourage tutor empathy towards students and a transactional presence to develop. Another interesting finding was the predominance of distance and independent learning amongst the students and a lack of online learning collaboration and communities. As the tutor grows in experience, this could be an area that is further encouraged and developed.

In conclusion, it can be seen that there are some interesting implications for the development processes of tutors working in online learning environments generally, and in the ‘blended learning’ situation, as adopted for the modules in the Motivate project, in particular. When tutors are faced with the facilitation of computer-mediated communications, particularly for the first time, like some of the tutors involved in the Motivate common module delivery, it is important to acknowledge their potential development needs in making the successful transition from classroom-based to online tutors, and to reflect upon the issues raised by this case study.
References


Investigation of Online Learning Process in Moodle by Web-mining Methods
(Peter Toth)

Background

Many electronic-based syllabuses and virtual courses have been developed world-wide during the last 10-15 years. However, not much has been heard of their success or efficiency, as would be supported by scientific testing. Firstly, this study provides an overall picture of the structure of virtual courses, and basic knowledge of “data mining”, mainly in the area of “web-mining”.

The analysis of student behaviour in the learning environment is based on a log file created on the server, which monitors interaction between learners and the electronic syllabus. There was the opportunity to analyse the learning activity of the students in the learning environment by using methods of web-mining. The second part of the study presents the results of this research.

Web-mining was first mentioned by Etzioni [1], who suggested that traditional data-mining techniques for finding hidden patterns in huge databases, could be applied to web-based information. Web-mining is an emerging method in educational research, assisting instructors and developers in improving learning environments and supporting the decision-making of policymakers [2].

Models for applying usage mining as a research method in education were suggested by Pahl [3] and Zaïane [4], although earlier research already discussed the potential of analysing on-line courses using this method [5]. According to Pahl, usage mining of e-learning processes is totally different from usage mining of e-commerce, since the learning process is far more complicated than the shopping process, and its cognitive aspects are much more difficult to track by means of log files. [3]

Ai and Laffey compared the data mining questions in business, traditional education and e-learning, Table 1 shows the approach differences. [6]
Table 1 Comparison of data mining philosophy in business, traditional higher education and e-learning

<table>
<thead>
<tr>
<th>Business</th>
<th>Face-to-face higher education</th>
<th>E-learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who are my most profitable customers?</td>
<td>Who are the students taking most credit hours?</td>
<td>Who are the students with highest frequency of logging-in?</td>
</tr>
<tr>
<td>Who are my repeat Web-site visitors?</td>
<td>Who are the ones likely to return for more classes?</td>
<td>Who are the students most engaged on discussion boards?</td>
</tr>
<tr>
<td>Who are my loyal customers?</td>
<td>Who are the persistent students at our university, college?</td>
<td>What pages do the students access most?</td>
</tr>
<tr>
<td>What clients are likely to defect to my rivals?</td>
<td>What type of courses can we offer to attract more students?</td>
<td>What kinds of students are likely to get a high score on-line?</td>
</tr>
</tbody>
</table>

Apparently, it is the buyer/customer and the seller/merchant/agent in business, the student and the teacher in higher education, and the online student and the tutor/facilitator in e-learning who are “in contact”.

Introduction of the Moodle Course in the MOTIVATE project

The most technology-demanding subject in technical teacher training is Educational Technology and Multimedia. In the framework of this subject, students on full-time and correspondence courses learn how to use educational technology devices in their pedagogical work (overhead projector, video, video projector, document camera, etc) as well as the means of and equipment for preparing and developing information media (transparencies, video films, photographs, figures, digital presentations, etc).

The increase in dynamically changing syllabus content and the decrease in the number of contact classes made it necessary to develop, then use electronic syllabuses in this subject first. As a result of the first development we composed a multimedia base syllabus of four modules (basic skills, digital image editing, digital vector graphics editing, digital video editing), which we made available to
our students on an optical disc. The electronic syllabus does not only show the structure of education technological devices, their installation and the possibilities of their application in education, but it also surveys and drills the development process of information media. In other words, a lot of emphasis is laid, besides communicating information, on the skilled acquisition of editing programmes. Meeting this dual requirement was reflected in setting the electronic syllabus contents. In the course of communicating information, images, illustrations, texts (written and narrative), animations and videos, while in the course of presenting structural algorithms, animations supported by narrative explanation were applied. Figure 1 shows such a case of a saved display page.

Fig. 1 The Layout of the Electronic Syllabus

In the meantime, emphasis shifted increasingly from a multimedia based individual learning environment to collaborative and cooperative learning environments. Therefore we also revised our electronic syllabuses to meet the requirements of the virtual learning environment. Since these syllabuses were available in html format, it seemed practical to insert them in the same format in Moodle. Several Moodle objects (forum, submission, test, wiki) were added to the electronic syllabus, organized into modules.
The syllabus was conceived in a “blended-learning” form. Students took part in a 3-hour practical each week, where they learnt how to handle education technological devices and how to use, at a basic level, all those programmes which make the preparation of the most frequently used visual aids, teaching aids and electronic syllabuses in technical and adult training possible.

In guided practical sessions students worked individually to process electronic syllabuses, prepare their homework, and take part in forums. Through the opportunities offered by a wiki, joint syllabus development in a selected topic also took place. Student skills were assessed using the Moodle test module.

![Diagram of Syllabus Units]

**Fig. 2 The Structure of Syllabus Units**

As investigation was partly targeted at the processing specialities of the syllabus inserted in html format, and the following commentary illustrates its structure. The electronic syllabus, as mentioned earlier, was divided into four modules and then 2 to 4 further units were separated within each module. One syllabus unit covered 15 to 20 mixed-structure (hierarchical-linear) display pages on average. The structure of the units and the navigational links are given in Figure 2. The first pages of the subsections are directly accessible from the main page, and so are the subsequent pages, in a sequential fashion. The main page can be reached from any page. It is not necessary to use main page subsection links, as pages can be displayed subsequently by clicking on the arrows in the bottom right corner.
"Glossary" and "Help" are accessible from any display page. It is a problematic feature of the navigation that the back arrow does not point towards the previous display page (icons in top right corner, fig. 1) but sometimes towards the main page (reference error), thus breaking the continuous processing of the syllabus. Another navigational problem is that sometimes pages which can only be reached from the menu in the main page by sequential navigation, are wedged between the main page and the first page of the first subsection. For this reason these pages were often omitted from syllabus processing.

Posing the Problem

Within the framework of a traditional classroom or laboratory lesson the teacher often thinks it necessary to pay attention to and directly control students’ work. It is questionable, however, whether or not students can follow the teacher’s presentation and explanation, and then perform the task on their own computer with full concentration. Whichever the case, following reproductive applications, they work efficiently enough in the course of problem solving which demands greater productivity. Tutors generally make sure by walking around the classroom and checking the phases of tasks, later problems being solved by the students, or by drawing conclusions about the various phases of the learning process from questions aimed at problem solving.

The situation is entirely different in the case of electronic syllabus processing. Seemingly, there are no means whatsoever to follow the process of information acquisition and learning. Tutors may mostly make conclusions about problems of cognition, therefore of the lacks or even faults in the content or structure of the electronic syllabus, through the student’s achievement (submitted tasks, test results). Additional information may be obtained through forums and online discussions. Although Moodle offers a few tools to follow students’ work, no genuine conclusions can possibly be drawn from these. Descriptive statistics of this kind are able to provide a general view of students’ work and help us to identify the less active persons, but it is beyond Moodle Report to recognize deeper connections and relations or to draw conclusions. There has been no adequate device so far for
providing information about the interactive process between the student and the electronic syllabus, its frequency and duration, the route, time and depth of syllabus processing, the time devoted to the acquisition of the particular syllabus elements, in other words, for the description of student behaviour in the electronic learning environment. Likewise there has been no system for observing the introduction of various student attitudes, and for conducting the quality analysis of the electronic syllabus as well as that of the virtual learning environment.

Online web-mining methods offer fast, easy-to-survey and clear answers to some of the above questions, thus satisfying many of the needs of syllabus developers. The precondition of the application of these programmes is that the so-called "Follow" code (Javascript code) must be placed on the web-site to be analysed. This method does not offer the possibility to analyse data created before the installation of the code.

Offline web-mining methods such as SPSS Clementine and its Web-mining node are able to provide opportunity for a lot more profound, more comprehensive and more scientific analyses, far beyond descriptive statistics. It is an aggravating circumstance for the application of online tools that within the virtual learning environment several simultaneous courses are running. The isolation of related results as well as their survey are often too complicated. It is also difficult to perform analyses concerning the levels of the objects comprising the module and the pages comprising SCORM module and the html base syllabus. Clementine is also capable of extracting related data from the log file.

If we examine the structure of Moodle from the point of view of references, we can declare that it is characterized by a manifold divergence. Object categories like for example syllabuses, forums, glossaries and tasks are collected separately. All courses have a standard identification number, which makes ”detaching” data so much easier. Just think, there may even be as many as hundreds of courses in a virtual learning environment! The identification number of our Education Technology – Multimedia course under investigation is id=37. Thus the identification of particular Moodle objects may be straightforward, for example, “/moodle/mod/forum/index.php?id=37”, the summary page of forums, or “/moodle/mod/forum/post.php”, which is for adding a new topic to the forum. The identification of the main page of the course is “/moodle/course/view.php?id=37”.

61
Each page of the electronic syllabus is associated with an html file, which made the analysis much easier. In the case of the html format electronic syllabus, the units of the syllabus were placed in separate directories, with each display page held as a separate file. For example, the log file entry to the 5th display page of the syllabus unit entitled "Digital vector graphics editing 1" is as follows: "/moodle/course/view.php?id=37", the reference of the Glossary, accessible from any page, is "/moodle/course/view.php?id=37", whereas that of the Help is "/moodle/file.php/37/Idofuggetlen/Da1/Sugo.html".

<table>
<thead>
<tr>
<th>Syllabus units</th>
<th>Marked as</th>
<th>Number of Sub-section</th>
<th>Number of Display Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Skills 1</td>
<td>E1</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Basic Skills 2</td>
<td>E2</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Digital vector graphics editing 1</td>
<td>Dk1</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>Digital vector graphics editing 2</td>
<td>Dk2</td>
<td>2</td>
<td>18</td>
</tr>
<tr>
<td>Digital vector graphics editing 3</td>
<td>Dk3</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Digital image editing 1</td>
<td>Da1</td>
<td>3</td>
<td>18</td>
</tr>
<tr>
<td>Digital image editing 2</td>
<td>Da2</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>Digital image editing 3</td>
<td>Da3</td>
<td>2</td>
<td>12</td>
</tr>
</tbody>
</table>

Table 2 The Structure of the Electronic Syllabus of the Education Technology – Multimedia Course

In the html base syllabus the student views the hyper-document through navigation by jumping from one node to another, and accesses information stored in the nodes. Rivers and Storss distinguished five types of navigation strategies. Scanning, that is the survey of a certain confined quantity of information; browsing, that is following the designated route; searching; exploring, that is mapping the extension and the boundaries of information; and finally wandering, which is unstructured searching [7]. Exploring and scanning are to be considered very similar strategies. The virtual learning environment makes all five navigation strategies possible. However, students primarily navigate in the system to access the syllabus. When the syllabus designer places nodes in the syllabus, (s)he is doing so in order to endow the student with the liberty to explore the syllabus, although (s)he would not like scanning,
let alone wandering to become dominant. In other words, (s)he wishes to keep the balance between “freedom to roam” and restricted movement.

In the Education Technology – Multimedia course it was intended to show the sequence of syllabus units by the order they were placed in the course as well as by numbering them. At the same time, the student was free to decide the order in which to process the syllabus. The designers preferred subsections within a syllabus unit, and linear navigation within those, although sequential navigation was also made possible after the main page. Linear navigation was not designed one-way only, and stepping back and exit from Help was guaranteed too. Self-check tests were also built into the Moodle course, and students could use these at any time they wanted to test their knowledge. These tests could be integrated into their learning process at any stage.

From all this it follows that within the virtual learning environment the designer of the course and the electronic syllabus sets two tasks to the student, namely covering the route as it was planned, and understanding, as well as accessing, the syllabus units in the nodes. Conclusions may be drawn about certain cognitive processes, strategies and learning characteristics from the student – virtual learning environment, in other words, the student – Moodle objects, and the student – electronic syllabus relations, that is the learning activity or, generally, behaviour of the students may be open to investigation. Peculiarities can be explored and certain learning habits can be distinguished and typified. Two cognitive maps take shape from the context of syllabus developer – electronic syllabus – student. More precisely, two cognitive maps are compared: the map conceived and created by the developer (Fig. 2) on the one hand, and the cognitive map as finally realized by the student. We may come to conclusions about certain learning characteristics by comparing these. The simpler a cognitive map is, the simpler its inner representation, and the more complex it is, the longer time it takes to understand and note. The cognitive network which is as simple as possible and repeated at each syllabus unit needs the least possible attention from the student during navigation, so emphasis falls on the acquisition of information in the nodes.
Having said all that, answers are now being sought to the following questions by applying methods of web-mining:

- What role did narrative, time-dependent media presenting processes of construction and explaining theoretical skills play in the course of learning?
- To what extent did students in the Education Technology – Multimedia course prefer the order of processing syllabus units as suggested by the developer?
- Can syllabus-processing types be differentiated and, if so, what characterizes the types?
- How does Glossary and Help fit processing the syllabus units?
- How did the learning process conceived by the developer relate to the one realized by the students within a syllabus unit?

**The Interpretation of the Results and the Aspects of the Further Development of the Moodle Course**

The main objective of the investigation was to explore by web-mining methods the most important characteristics of student behaviour or, in other words, the learning activity during the accomplishment of the Moodle courses. The results presented in the previous chapter do not describe classic e-Learning-based distant learning but blended-form full-time training where traditional classroom education is specially integrated with online and offline learning methods.

Students took part in 3-hour practical sessions each week, where they learnt how to handle educational technology devices and how to use, at a basic level, all those programmes which play an important role in the preparation of visual aids, teaching aids and electronic syllabuses. Between practical sessions students, working individually, had to process electronic syllabuses, prepare (and then upload to the system) their homework, and take part in forums. To assist preparation, self check tests were inserted into the course. Student skills were assessed by using the Moodle test module.

In introducing learning activities two approaches were followed: on the one hand, the role in the students’ learning process of the objects which produce learning activity on the virtual course was explored (macroanalysis), and on the other hand the microstructure of processing electronic syllabuses was investigated.
Macroanalysis

In the course of microanalysis the researchers wanted to see what role Moodle objects inserted into the course (html base electronic syllabus units, static glossaries, submission, forum and self check tests) played in online and offline learning. To answer this set of questions the visit level analysing streams of the programme were used. First, the electronic syllabus was examined; this is divided into three modules (basic skills, digital image editing, digital vector graphics editing). The modules consist of syllabus units (separate objects), and those in turn consist of subsections accessible from the menu. The pages of the subsection are on the one hand linearly connected and, on the other hand, their first page is accessible from the menu. In the case of macroanalysis the succession of modules and syllabus units, while in the case of microanalysis that of subsections and pages during visits were examined.

![Visit Activity Funnel](image)

Fig. 3 The Succession of Syllabus Units Comprising Visits

Although all modules and syllabus units were visible simultaneously on the course, students followed the order set by the tutor and the way
syllabus processing took place during practical sessions. Mid-term tasks and module-end tests also prevented "campaign-like" learning at the end of the term. In processing syllabus units (usually 2 or 3) comprising the modules, two types of learning strategies could be distinguished. The most dominant form of learning strategy was when a student visit aimed to process more than one (usually two) syllabus units, but aiming to acquire only a single unit was also common. There were few visits seen which aimed at processing all the syllabus units of a module besides doing the self check test (Fig.3). Thus the developer’s intention that students should learn not only before the check test appears to be realized. Although there is no real continuous student activity on the course, significant steps could be taken in the direction of collaborative learning by a well-structured course and well directed student activities.

Fig. 4 The Result of TwoStep Clustering with Identified Clusters
The above is reinforced by the so-called two-step cluster analysis, since it made the distinction of two learning strategies possible: the one limited to a Moodle object and the other, "successive" syllabus processing (Fig. 4).

The Glossary was accessible in two ways: as an independent object from the course on the one hand and, on the other hand, through an icon from any of the pages of the syllabus unit. It can be seen that students used this tool on a few occasions only, and even then mostly in the first modules only, so the Glossary has not become an integral part of the learning process.

The self check tests were taken mostly after finishing the particular module, usually within a single visit.

Activity in forums also turned out to be quite moderate. Mostly, the forum functioned as a tutorial message board, in that students quite often paid a visit but rarely "took the floor".

During the planning and organization of the course the above objects could possibly be better integrated into the learning process. The following steps of organizing learning and course are recommended to be taken:

- dynamic Glossaries should be created where students may have an active role, specifically by connecting the lexicon editing activity with the electronic syllabus

- the tutor is to encourage Forum activity and provide concrete instructions – or even links during the technical realization – referring to ideas and questions for the given syllabus and task setting, and (s)he is to make students’ Forum activity a part of their assessment

- mutual assessment is to be made possible in Submission

- SCORM based development makes the integration of self check tests into the syllabus possible.
As a result of the above, the number of students’ "flash visits" is decreased and a learning process takes shape which is more extensive in time and more diverse in content and makes students more active.

Fig. 5 The Interpretation of Concepts Related to Timing

Another dimension is given to the microanalysis of the learning process by examining it according to its timing. The concepts of "recency", "frequency" and learning period/active days were introduced for this purpose (Fig. 5). Five types of student behaviour were distinguished on the basis of the former two. The student

- had contact with the virtual learning environment a few times but in a relatively even distribution during the term
- was a frequent visitor to the course in a relatively even distribution
- was a moderately frequent visitor to the course in a quite uneven distribution
- was a rare visitor to the course in an uneven distribution
- was a moderately frequent visitor to the course in an uneven distribution.

Days active are in inverse proportion to "recency".

**Microanalysis**

As mentioned earlier, the microanalysis of the learning process focuses on the subsections comprising syllabus units as well as on the page which forms the syllabus. Those streams of the programme which aim to analyse pages and their sequence are usable.
To an extent, syllabus processing within a syllabus unit is constantly characterized by student "dropout"; with regard to syllabus units it was mainly typical of the ones processed first, whereas with regard to pages it was typical of the first 1 to 3 pages. Obviously, both are seen to originate in online learning and familiarity with the electronic syllabus. "Dropout" may also be interpreted in the dimension of the theoretical and the practical syllabus. Although it is more significant in the case of the former than the latter, it is constantly present in both. Students thus interrupting syllabus processing certainly return later and continue learning.

Fig. 6 The Distribution of Events on the Course ("steady" students at lengthier syllabus units)

According to the length of successive series of pages, "steady" ("unflagging"), "giving up" ("flagging") and "tasting" ("trying") student behaviours can be distinguished. Having once entered a syllabus unit, the first one will typically learn the whole unit up to its end (Fig. 6). The student who easily "gives up" will not fully cover all the pages of the particular syllabus unit (Fig. 7) and he will escape when he becomes bored with the task which needs persistence. He is not certain to re-enter later and continue learning where he has left off. The "tasting" type will "leaf through" the material, get oriented and then interrupt the visit, but later he will return and fully deal with it.

To finish, we mention the last question of microanalysis, which aimed at the role of time-dependent media in syllabus processing. Average time allotted to process pages containing only texts or graphics was acceptable, but leafing through was frequent, too. It was mostly typical of "tasting" ("trying") students. It is considered as “leafing
through” when the student spends considerably less time over a given page than would be necessary to fully understand it, usually a few seconds only. Digital videos were usually played, especially when playing started automatically on opening the page, but this way it precedes reading the introductory text. It was not typical to interrupt playing automatic videos.

Fig. 7 Processing Syllabus Unit Digital Vector Graphics Editing 3

Playing narrative audio did not unfortunately become an organic part of online learning, which may be due to the "start playing" icon not being highlighted.

The above unambiguously shows that the realization of a really efficient, collaborative learning environment (individual learning within a community) requires an approach different from the one seen in the case of the course under investigation, from a constructional, organizational, tool-centred and tutorial point of view.

From a constructional and organizational aspect, for the virtual course to be processed in the form of blended learning, it is advisable to be divided into weeks. It is practical to assign to these weeks the syllabuses to be processed as well as all Moodle tools which aid processing. The structure of each week is identical. See a possible structure below:

- setting aims and requirements
the (preferably SCORM base) virtual publishing of the syllabus
- defining and uploading student tasks
- cooperative work (online dialogue, wiki, workshop, etc.)
- online testing and assessment

Using tools primarily manifests itself in such first and second generation web-techniques which are characterized by content share and exchange, online dialogue and collaboration.

From the tutorial point of view the personal and continuous checking of the learning activity is to be emphasized besides the timing and encouragement of work on the course, the initiation of considerable activity in forums and debates, as well as prompt feedback on all student activity.

References


Masters Level Student Teachers and On Line Learning Communities: a Portuguese Case Study
(Carolina Santos – Teresa Oliveira – Lourenço Frazão – Sofia Oliveira)

Introduction

This case study is a synthesis of a research project\(^1\) by three Portuguese universities, which posed the question: how can ICT in masters level courses for trainee teachers promote the dialogue between educational research and school practice? The study aims to inform developments arising from common module delivery in the Motivate project, and relates to both Masters level developments and technical innovation in vocational teacher education.

The Portuguese project focused on the nature, mechanisms, difficulties and procedures related to the interaction between researchers and master student teachers, mainly in an on line context. In the first part of the project constraints for this interaction were identified through thirteen master students teachers interviews. Chapters of the Introduction and of the Conclusions of thirty-nine MA and PhD theses were also analyzed. In the second part of the project an on line learning community (LC) was constituted using a platform for the interactions among participants (30 master students teachers and 10 educational researchers). The methodology was based on a case study, being the case the interactions in the LC. A variety of research tools were being used in both phases, such as interviews, documental analyses, observation and questionnaires. The data analysis of the interviews and thesis was done by content analysis. Descriptive statistics was used for analysing data from the questionnaires and analysis of the interactions in the platform. The analysis of the interactions allowed determining the collaborative strategies used by the participants (according the model of Gunawardena \textit{et al.} 1997). The role of each participant within the on

\(^1\) The IPEC Project POCTICED/58825/2004, is funded by the Portuguese Foundation for Science and Technology (FCT).
line learning community was analysed according the categories defined by Mentis et al. (2008). In the online LC, four groups, with teachers who attended master courses in Education and researchers from different geographic areas of the country, were constituted and a set of in depth interactions between the members had been taking place.

**Theoretical background**

Education is mainly developed on the basis of communities i.e. researchers, teachers and students, which, as it is emphasised by some authors, (Ginsburg & Gorostiaga, 2001; Hammersley, 2002), are not satisfactorily articulated.

Being aware of the complexity and demands of the educational processes and simultaneously the conceptual and professional, teachers and researchers concerns it is necessary a strong cooperation between these groups (Costa et al., 2003; Osborne & Monk, 2000).

According to Evans (2002), the interaction between research and practice is not a usual theme in educational research. Suggestions to facilitate the articulation between educational research and teaching practices emerge from the investments in master courses, evaluating their impact at teacher education level and the development of networks integrating researchers, teachers, students and other participants in the educational system.

Cachapuz (1997), among other authors, suggests that research in master (MA) courses for teachers’ training promotes innovation in teaching practices, taking into account the potential of the production of knowledge instead of merely the acquisition of knowledge. In these courses the component related to the development of the competence “use innovation and research” is highlighted. According to Alarcão (1994), this competence must be acquired during teachers’ training and permits the articulation between the research dimension and the professional dimension. As far as MA courses are concerned, their positive influence on teachers’ innovative practices should be stressed, taking particularly relevance these courses for teachers’ personal and professional development.
Comparing the continuous training with the training acquired in a MA degree, exist a set of differences in motivation but also in an in-depth study. MA degrees create “higher expectations” and give the opportunity to develop a research in the field under study: “the motivation for a MA degree is high, since it allows the acquisition of knowledge and skills to do research. This doesn’t happen with the other teacher’ training type” (master student opinion).

Dissatisfaction concerned with individualistic approaches to teacher education, that lead to recognise that teachers need experience as participants in collaborative learning communities (LC), in which they are afforded the opportunities to articulate, reflect and share their teaching experiences with their peers (Barnett, 2002). As a result, teachers often become frustrated with professional development because it is inadequate or requires large investment of time they do not have (Dede et al., 2005).

In master courses as in other learning contexts learning communities are seen as opportunities to observe, to interact and collaboratively reflect with different participants; the establishment of a LC is an option for promoting interaction and fighting against individualistic professional work.

The approach of Lave and Wenger (1991) what concerns construction of knowledge implies an essential critique of how learning usually is organized. This approach leads to a complete revision of traditional settings of teaching and to the necessity to re-think the role of the participants in the learning process, because it usually do not apply to a notion of learning as a process of participation and social interaction in learning communities.

Social interaction is a critical component of learning - learners become involved in a community. The newcomer moves from the periphery of this community towards its centre as he/she is becoming more and more sophisticated in learning and is moving therefore from being a novice to being an expert. Learning community combines individual and social learning. For the individual as a learner, social learning is learning in the context of a community that enables and supports personal/social learning.

A learning community’ environment supports the collaborative construction of knowledge. Collaboration demands interaction,
exchange of ideas and engages thinking and reflection, which at the end creates understanding and meaning. Knowledge is being in part a product of the activity, context, and culture in which it is developed.

Nowadays is consensual that communications based on computers linked by network are an important resource with large potentialities for knowledge development. The selection of specific technology implies different dynamism within a LC.

The virtual communities are more and more "expressive" due to the use of their own symbols and the improvement of technology namely the sound and image systems. These facts allow a strong interpersonal links among participants in the virtual communities similar to face-to-face interactions.

The first option for using the technological interactions is to choose asynchronous or synchronous communication i.e. communication can be in different time or in real time such as the use of mail or IRC (Inter Relay Chat). In general terms, it seems that some authors (Haythornthwaite, 2001) preferred the asynchronous communication instead of synchronous communication for the production of knowledge. One of the advantages of the on line asynchronous and remote communication is to allow the control of the participation among the participants in the community because they can read or send messages when and where they decide to do it and to send them simultaneously to multiple participants. Besides this, the participants have time to reflect and write an answer more elaborated. It is a precious delay for thinking and for the ideas becoming mature. The analysis of that ideas and their synthesis allows sending a conscious and reflexive answer without limitations of time or place.

The Project IPEC - Research and Practice in Science Education: Dynamics of Interaction

This study was developed in the framework of a research project involving three Portuguese Universities (Aveiro, Évora and Lisboa).

The project IPEC, was based on the assumption that there is a lack of articulation between the researchers and the practitioners (Cachapuz, 1997; Holbrook et. al. 2000, Ginsburg & Gorostiaga, 2001; Hammersley, 2002; Costa et al., 2003).
The problem under research was: how to promote interaction between educational research and school practices with effectiveness for both using ICT? Two particular questions can arise from it: does a learning community (LC) that involved researchers and master students enable an easier interaction between these two groups? How does the analysis of the community under study, working in an on line context contribute to build a mediating framework for the interaction between research and practice?

The research was based on the following assumptions: i) there is a gap between educational research and practitioners, and it is important to promote interaction between them; (ii) the research educational agendas, priorities and processes, need to focus more on implementation studies developed by researchers and practitioners; (iii) ICT can facilitate the establishment of research teams involving educational researchers and practitioners; (iv) master students in teacher training courses can be the possible link between researchers and practitioners. The rationale of these assumptions is rooted on the fact that Education, in general, and ICT in particular, are the cornerstone of the Knowledge Society at the beginning of the XXI Century.

The project had two phases. The main goal of the first phase was to identify constrains for the interaction between researchers and practitioners and to plan the second phase based on that results.

Some of the reasons put forward by first phase of the project to explain the gap between researchers and practitioners were related to, among others, epistemological differences between each community, non-appropriate dissemination of the results, different types of language used, inaccurate definition of the research problems under analysis and the composition of research teams (Kempa, 2001; Loureiro et al., 2005, 2006; Porlan et al., 1997). In the second phase of the project a learning community supported by ICT was constituted – an on line learning community. This on line learning community was seen as an opportunity for collaboratively reflect how to solve the problem under study. Part of the interactions among participants was done through a communication platform on line. Since the first period of information gathering was finished, the difficulties emerging from the master students teachers’ practice were identified and the scientific
areas that should be discussed and planned collaboratively on line were selected.

**Methodology**

In the first phase of the project (one year) semi-structured interviews were applied to thirteen master students teachers. Chapters of the Introduction and of the Conclusions of thirty-nine MA and PhD theses were also analyzed. Interviews and dissertations were analyzed through content analysis.

In the second phase of the project (two years) the methodology adopted was qualitative, based on a case study, in which the on line LC was the case itself. The LC integrated researchers and master student teachers from Aveiro, Évora and Lisboa. The master student teachers were mainly female, with more than ten years of teaching experience who attended a master course in Education. The participation of pos-graduated teachers was based on the assumption, as referred by Loureiro et al., (2005), that they could play a relevant role in the interaction between researchers and practitioners, namely facilitating the dialog between them. The researchers had different initial backgrounds, Biology, Geology, Physics and Engineering. All worked in Departments of Education in different universities. They had coordinated master courses. The main research areas of interest were diverse, like epistemology of education, didactics and ICT in education. The researchers’ professional experience was high, more than fifteen years.

A variety of research tools had been used, such as interviews, documental analyses, observation and questionnaires. Data triangulation was also performed.

The second phase of the project had four research steps: i) update of the literature in the field and in-depth study of the methodological procedures, including the development of the data gathering and the data analysis techniques to be used; ii) description of the researchers’ and practitioners’ perceptions about their own practices and of their expectations related to LC and ICT. The LC was established in this step; iii) two on line questionnaires were administered to the master students teachers. The first aiming the identification of master students teachers profile related to the familiarity with ICT and the difficulties
emerging from their practices. The second one aiming to gather the information about the use of the platform and the way the community was working; iv) thematic modules were negotiated, implemented and evaluated using for that the web platform. It was a period where the number of interactions was very high. The modules implementation and its impact were analysed on the basis of master students teachers’ and researchers’ evaluation; v) data analysis for contributing to a mediating framework between research and practice. In this phase a workshop, involving experts in the field, was organised to present and discuss the ideas emerging from the results of the project.

The LC was constituted with thirty master students teachers from ten secondary schools and ten educational researchers, from three universities, from different geographic areas of Portugal. For the LC constitution the following tasks were carried out: i) several regional meetings took place, enabling, firstly the presentation of the project to the master students teachers and, secondly, the administration of a group interview. The aim of that interview was mainly to look for master students teachers’ perceptions about their practices and the use of ICT in educational settings, the usefulness of educational research and their expectations towards this research project and the on line LC (Loureiro et al., 2007). A group interview was administered to the educational research staff members, looking for their perspectives related to the rationale of their own research and also looking for their attitudes towards the impact of the findings of their research on teachers’ practices; ii) a general meeting occurred with all the members of the community, for a first personal contact between them. According to Barab (2003, p. 199), the development of trust among participants is a pre requisite for the reflection on their own practice and on the colleagues practice: “trust is fundamental to participation”. Also, the aim of this meeting was to familiarise the participants with the web platform, through a workshop. The platform played a crucial role, since it was the main communication tool used. The procedures for the future, like how to organise the working groups, were also discussed. From this discussion four work groups with master students teachers and researchers were formed.

A period of intensive on line interaction was occurred for constituting the work groups and defining the topic (sustainability was the selected topic) to be worked in collaboration. This intensive on line interaction goes on during the definition of the work strategies, the in-depth study
of the selected content, the built of curricular materials, the modules implementation in classroom and the evaluation. Two of the four work groups needed to plan face-to-face meetings for taking decisions.

The researchers proposed tasks in order to go deeper in the theoretical framework, taking in account the master students teachers’ suggestions and questions. Some themes as sustainability or evaluation were common to the four groups. Some theoretical texts were available in the platform and the plans and curricular materials were discussed and re-oriented when necessary. Often, the way to stimulate and incentive the participation of all the elements of the community was discussed and some solutions were tested.

The Fig 1 summarize the steps of the development of the 2nd phase of the project

![Image](image.png)

**Figure 1: Steps of the development of the 2nd phase of the project IPEC**

The data analysis of the interviews and thesis was done by content analysis. Descriptive statistics was used for analysing data from the questionnaires and analysis of the interactions in the platform. The analysis of the interactions allowed determining the collaborative strategies used by the participants (according the model of Gunawardena *et al.* 1997). The role of each participant within the online learning community was analysed according the categories
defined by Mentis et al. (2008). Experts validated the definition of categories.

Results

In the first phase of the project constraints that influence the connection between research and practice were identified (Loureiro et al. 2005, 2006). The constraints to the articulation between research and school practice in education were connected with the following aspects: A) intra and inter communities interactions (insufficient dissemination of the research results, long distance from formal educational institutions, lack of interaction dynamics); B) attitudes toward innovation (resistance to innovation from the students, the teachers and the educational system); C) nature of teachers’ training (inadequacy of teachers’ education, overvaluation of the practice, …); D) school resources and management (difficulties with curricular management, lack of materials, sensum lacto; lack of space and time for reflexive work and dialogue; lack of collaborative work among peers); E) representations (depreciation of research value by practitioners or underestimation of the teacher’s career); F) theoretical discourse (hermetic language and jargon of research, the lack of coherence between theory and the school practice needs); G) educational policy (the non valuation in school context of teachers with a post-graduation, the lack of political measures to evaluate the teachers’ work, overvaluation of quantitative assessment). Although all the categories were identified both by the interviewees and in the analysis of the master and PhD dissertations, the constraints C and D were highlighted (figure 2).

![Figure 2: Constrains identified from the interviews and dissertations](image-url)
In the second phase of the project and concerning the perceptions about school practices of the master students teachers, the results reveal that there were different approaches to educational practice: from a traditional towards an innovative one. Table 1 presents the analysis of master students teachers’ perception of their practices divided in four categories. The types of approaches mentioned above, traditional vs. innovative, were also taken into account. This analysis is illustrated with sentences from master students teachers’ answers.

Table 1 - Analysis of master students teachers’ perception of their education practices

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>Innovative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aims and objectives of education</strong></td>
<td>Focus on instruction</td>
<td>Focus on education: competencies based learning and knowledge</td>
</tr>
<tr>
<td></td>
<td>Content and teachers centred strategies - ...last two weeks I had to expose the content</td>
<td>contextualization: rocks and minerals cannot be dissociated from our lives, isn’t it?</td>
</tr>
<tr>
<td><strong>Lesson plans</strong></td>
<td>Content centred</td>
<td>Interdisciplinary approaches: we are always in pedagogical pair ... the math class is after physics one and so students can try math models to the physical phenomena under study</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>Mainly content exposition: the curriculum forces ourselves to expose</td>
<td>Practical activities such as, outdoor work: every year I do some field work ... we visit museums, exhibitions ...</td>
</tr>
<tr>
<td><strong>Evaluation and assessment</strong></td>
<td>Insufficient global evaluation: we evaluate the product and not the process</td>
<td>Diversity of evaluation methodologies: we use different methodologies, portfolios, presentations of their [students] work</td>
</tr>
</tbody>
</table>
From the master students teachers’ interviews, we can report that the majority of them participating in the project had high expectations about it. They expected to be more skilful in ICT. They also had good perceptions about the possibilities of applying research findings to school practice. Master students teachers stated that their enrolment in the project may permit: i) to change school practices as well as to reflect about them and to develop more thoughtful practices; ii) to give importance to actual practices - … by observing individuals [teachers] in that context [classroom], one can see the problems from another perspective; iii) to use ICT with colleagues and with students, iv) the emergence of a new way of working and training as well to identify research problems.

The researchers’ interview reveals that their work was influenced by: i) the international research community; ii) their institutions (research centres/university policy and projects); iii) national research policy; iv) the need to improve professional school practices. The researchers recognize that research done was limited both because it was analytical and compartmented (centred in research lines), and didn’t account the epistemological complexity of education, or because it was reactive. Some of the difficulties felt by the researchers were related to task overload as well as dispersion and community heterogeneity. The inconsistencies of the educational system referred by the master students teachers (teachers education, competencies-based curriculum vs. national exams, …) were also emphasized. It was claimed that researchers needed to create networks and have an active voice in the educational policy. Some of the problems concerning the articulation between education research and school practices reported by the researchers include: i) the difficulty of the language used by researchers; ii) the lack of applicability of the research results; iii) teachers and educational system resistances.

Each one of the four work groups interacted, shared ideas, negotiated, planned activities and evaluated the work done through the Blackboard platform using different web tools such as forums, chats, mail, etc. The table 2 summarize the statistics about the interactions that occurred.
Table 2 – Interactions through the work tools in Blackboard platform in the different groups

<table>
<thead>
<tr>
<th>Groups</th>
<th>Chat</th>
<th>Electronic mail</th>
<th>Forums</th>
<th>Change of folders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>80</td>
<td>88</td>
<td>149</td>
</tr>
<tr>
<td>Group 2</td>
<td>7</td>
<td>344</td>
<td>147</td>
<td>451</td>
</tr>
<tr>
<td>Group 3</td>
<td>1736</td>
<td>698</td>
<td>47</td>
<td>286</td>
</tr>
<tr>
<td>Group 4</td>
<td>158</td>
<td>334</td>
<td>80</td>
<td>309</td>
</tr>
<tr>
<td>Researchers</td>
<td>563</td>
<td>506</td>
<td>376</td>
<td>381</td>
</tr>
</tbody>
</table>

(* Number de messages in the forums, ** number of sessions in chat)

The table 2 shows that the level of the interactions was different in the groups. The tools selected for interaction were also different: forums (group 2) and chat (group 3) respectively by the two more active groups were selected.

The different participation of the groups can have many reasons, namely:

- The work overload: difficulty to conciliate the teaching daily work in schools with the academic studies
- Lack of perception about the importance of a LC or the interactions on line
- Insufficient knowledge about communication on line
- Lack of effective coordination in face to face communication with on line communication
- An individualistic culture underlying teaching profession.

An on line questionnaire was administered to master student teachers in two consecutive academic years and data was analysed related to the obstacles to the interactions dynamics. The results are presented in table 3.
Table 3 – Obstacles to interaction

<table>
<thead>
<tr>
<th>Categories of obstacles</th>
<th>(%) 2007</th>
<th>(%) 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>6,71</td>
<td>4,50</td>
</tr>
<tr>
<td>Organizational/support</td>
<td>4,03</td>
<td>3,00</td>
</tr>
<tr>
<td>Social</td>
<td>39,60</td>
<td>27,00</td>
</tr>
<tr>
<td>Pre requisites</td>
<td>22,8</td>
<td>20,00</td>
</tr>
<tr>
<td>Attitude</td>
<td>7,38</td>
<td>6,10</td>
</tr>
<tr>
<td>Temporal/Continuity</td>
<td>19,50</td>
<td>36,00</td>
</tr>
</tbody>
</table>

The social (to work with unknown people), the pre-requisites (related to new way of working namely in a community on line) and the time were the obstacles more relevant. However, the two first decreased and time increased in the second year of the Project. This may due to the increase of familiarity among participants and the lack of time availability at the end of the academic year. Taking in account the data, in the above table, it seems that the strategies of interaction promoted by the Project, without eliminate the obstacles, decrease some of them.

Table 4 – Wenger’ indicators identified in the interactions of the on line LC (Marques, 2008, p. 156)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Examples of interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability of relationships - harmony or conflict</td>
<td>“Thanks for your concern in answering to my request. (Forum: Work plan; Data: 2007/07/19 14H06m; Author: ProfD.</td>
</tr>
<tr>
<td>Substantial similarity</td>
<td>“We think (me and ProfB) that the theme of groups 2 and 4 are similar and then we could do only one work group. (Forum: establishment of the groups Data: 2006/10/12 11H07m; Author: ProfE.</td>
</tr>
<tr>
<td>Shared commitment to do joint work</td>
<td>“After had read your proposals I think to approach in my class the contents of the 11 year of schooling as you.” (Forum: Work plan; Data: 2007/01/18 13H36m; Author: ProfB.</td>
</tr>
<tr>
<td>Quick information and innovation dissemination</td>
<td>“I already sent 2 or 3 references about project work.” (Forum: Work plan; Data: 2006/11/10 19H48m; Author: Res.1.</td>
</tr>
</tbody>
</table>
Working in an on line LC was an innovation for these master students teachers. They were obliged to change individualistic work habits and brook routines. Some had to learn technical details about how the platform worked. However the interactions held in a respect and mutual trust, with constant shared ideas and information and intensive questioning with no fear of negative judgments by the peers. The groups were actively engaged in individual and collective reflection for the development of mutual knowledge. Discussion and negotiation were crucial.

It was very important, in the opinion of the master students, the role of the researchers, advising, proposing innovative strategies, integrating the research dimension in the practice, guiding the discussions and organizing ideas. The results also showed that a dynamic guide was necessary in each group for monitoring and mentoring the LC. One of his (her) necessary task was to give feedback in real time for not stop the continuity of the interactions.

In all groups were evident the relevance of face-to-face meetings for facilitating the on line interactions. “To be present, to see each others is fundamental”. However, the two interaction modalities are complementary. “The spontaneity is richer in the face-to-face meetings but on line the writing help to develop the reflection” (opinion of a master student teacher participant in the LC).

**Discussion and Final Considerations**

The main aim of the first phase of this study was to contribute to the identification and understanding of constraints to the desired articulation between research in education and teachers’ practices. A study with an empirical component was developed which involved interviews with master students teachers and documental analysis of MA degree dissertations and PhD theses in the field of education.

One of the most mentioned constraints was related to teachers’ training, at all levels, initial, continuous and even post graduate. The key aspects of that constraint are, mainly, linked with the contents taught and the methodologies used, which are based in the transmission of information.
It must be referred that the above mentioned aspects are not in agreement with perspectives on teachers’ training based on research findings namely the component related to the development of the following skill: “use innovation and research”. According to Alarcão (1994), this skill must be acquired during teachers’ training and permits the articulation between the research dimension and the professional dimension of didactics. The analysis of the data carried out in this study suggests that this was not being accomplished. This implies the need to rethink teachers’ training courses and to give to this aspect a more relevant role.

Beyond training inadequacy, other subcategories related to the nature of teachers’ training, have been described more or less associated with this constraint. Our results indicate that teacher’s training does not improve teacher’s professional development on the basis of educational research suggestions. Moreover, as found also by Costa et al. (2000), teachers doesn’t seem to be aware of the findings from education studies that have implications for school practices. Inexistence of partnerships between training centres and research centres could be one of the main reasons for this shortcoming. This constraint may have implications related to teacher’s difficulty to interpret documents written within a research framework, for example, curricular documents produced by political decision makers.

As far as MA courses are concerned, their positive influence on teachers’ innovative practices should be stressed. The participants in this study, clearly stressed the particularly relevance of these courses for their personal and professional development. Multiplying effect was diminished by the lack of conditions to work in schools, for instance, with peers, as pointed out previously. MA thesis based on research questions that are mainly classroom-centred, seem to give an in-depth contribution to improve teachers’ practices, particularly those of their authors. Those results corroborate other studies such as Araújo e Sá et al. (2002) and Costa et al. (2003).

Suggestions to facilitate the articulation between educational research and teaching practices emerge from the analysis of this corpus. The authors stressed the following: investments in master courses, evaluation of their impact at teacher education level, development of networks integrating researchers, teachers and other participants in the education system.
Comparing the interactions of this on line LC with the indicators of the characteristics of one LC proposed by Wenger (1998, p.125) we can conclude that this on line LC had the characteristics of one LC and it is possible to establish a LC through on line environment. However, we can conclude from the findings about the dynamics in the different groups that the face-to-face meetings were crucial for the establishment of a LC and motivation for working on line.

The impact in the participants of the on line LC was different. Some were involved in a very active way. Some members of the LC went to the platform every day and acquired this daily routine. Some went to the platform very rarely.

With this interactive work and through the interaction in an on line LC we can say that it was possible to promote interaction between educational research and school practices with effectiveness for both using ICT:

- To identify a curricular thematic for joint work and the clarification of the main difficulties and the way to help them to solve these difficulties.
- Develop adequate curricular materials according the teachers and researchers opinions and the analysis of students after their implementation in the classroom.
- Give support to the master students namely bibliography with impact both in teaching practice, curricular materials production and at the end in personal and professional development.
- To facilitate to the researchers the knowledge of the problems, conditions and difficulties of the field and then be near the daily reality of teaching. This decreases the gap between researchers and practitioners.

Throughout this study, the authors have attempted to highlight:

The relevance of doing more in depth research within the promising area of LC, involving master students teachers and education researchers, mainly about the nature of their interactions;

The methodology defined to identify, at the beginning of the project, master students teachers and researchers’ perceptions about their own
practices, to analyse the development and interactions of the community and to look for the corresponding impact on both master students teachers and researchers’ practices;

The procedures, which have been used to create an on line learning community through both personal meetings and also on line interactions;

Views, difficulties and reflections from master students teachers and researchers related to their own practices and interactions, which should work as guidelines for future development of educational research.

In summary the establishment of an on line LC seems to had a positive impact in the interactions in both groups: researchers and master student teachers and allowed to build a mediating framework between these two groups. The dynamic of the collaboration depends on how the master students teachers and the researchers conceive this interaction and it is, no doubt, a complex process needing more in depth study.

**Resources**


Social Software in Class: yet another Hype or Serious Opportunities?
(Gijs de Bakker)

Technological innovations have given way to new applications of the world wide web. Many of these new applications, often referred to with terms web 2.0 or social software, have an emphasis on social aspects as participation. While education has not responded to these technologies in great deal, recent educational theories such as social constructivism give way to the introduction of web 2.0 technologies in educational practice. Some efforts have been made examining the possible value of using social software in education. This paper reports on the most important forms of social software and some of the educational opportunities for these technologies.

The web is changing, the world is changing

Over the last years, the world wide web has been engaged in a huge character change. When the medium became widespread among the larger public from the early 90s, it was mainly used for information exchange. Through the internet it was possible to rapidly send and receive data from all over the world. It enabled people to visit libraries on other continents and to send letters via e-mail instantly. Due to technological innovation and people finding new ways to use the world wide web, a lot has changed since the early 90s. In contrast to the first wave, where the internet was seen primarily as a medium for information exchange, user participation has turned out to be a new dominant factor. The change is considered to be so drastic, that the changed world wide web has been given its own term: Web 2.0 (O’Reilly, 2005). Social software, another commonly heard term in this sense, is the fuel for this Web 2.0 engine. It is “a particular sub-class of software-prosthesis that concerns itself with the augmentation of human social and/or collaborative abilities through structured mediation (this mediation may be distributed or centralised, top-down or bottom-up/emergent)” (Coates, 2003).
Not only the web itself is changing, but also the world in general. Wiley (2006) distinguishes six important changes in business, science and the world in general. These are changes from:

- analog to digital
- closedness to openness (especially for software and information)
- tethered to mobile
- isolated to connected
- generic to personal
- consumption to participation.

According to Wiley, education has hardly responded to these changes by emphasizing that education mostly has not responded to most of these changes until today. Indeed, educational sources have become digitally available more and more. Also, due to the widespread availability of (wireless) internet connections, education has become much more mobile than it was ten years ago. However, content is still as closed as it was a few decades ago. In order to gain access to education, enrolment in courses is still a prerequisite. Education is also still very isolated, generic (looking too little at personal needs), and consumption driven. Since the increasing adoption of new technologies the image of a teacher in front of a classroom merely transferring knowledge is seen less often, but online courses often use the same strategy: stuffing students with knowledge, asking very little active participation.

**Changing education requires different technological solutions**

Social constructivist psychological views are finding their way to education. Knowledge remains important, but participation, reflection, working in teams and a focus on competencies rather than internalised knowledge, gain more attention in today’s classroom.

Social software, previously defined as the fuel for human social and/or collaborative abilities via web 2.0 technologies, connecting people and making it possible for them to share ideas, interests and work tasks, seems to provide valuable tools for education’s changing demands.

Not only the recent educational theories finding their way into today’s education ask for different technological solutions such as social
software. While some teachers still may be somewhat resistant to (technological) innovations, society, and especially today’s youth is embracing new technologies at the moment they see light. A young generation of students that grew up with ICT being embedded in their daily lives (Prensky, 2001), have become used to the nearly instant availability of information through the internet, and the almost immediate accessibility of everyone through instant messaging (De Bakker et al., 2007) or phone-based text messaging (SMS). These expectations penetrate education more and more. For example the ease with which guidance can be sought via ICT, has lowered the barrier to do so (Simons, 2006). In other words, instead of always being able to ask ourselves objectively whether ICT is a good solution for the necessary changes in education, we have to accept the fact that technology is a given factor more and more.

**Educational social software: some current life forms**

Although Wiley suggests that education has not responded enough to changes in society, several attempts have been made to investigate suitable ways of implementing social software in educational contexts. An even larger number of enthusiastic teachers is testing new tools and applications in their own teaching. This section describes some examples of the efforts that have been made in education on the level of implementing or researching possibilities for social software. There are varying opinions on which technologies should be denoted as social software. Although there are many more technologies that are treated to be social software, this article uses Gorissen’s (2006) overview of social software as a basis:

- weblogs
- wikis / collaborative editing
- instant messaging
- forums / communities / newsgroups
- social networking
- virtual worlds / gaming
- social bookmarking

The following sections describe the above mentioned social software applications and some of the initiatives recently undertaken to examine possibilities for education.
Weblogs

Weblogs are websites that can be described as a collection of inverse chronologically ordered, updated versions of some site, with links to other sites, comments and other complementary information (Sloep & Poortman, 2005). The popularity of weblogs has grown enormously over the last years. The number of blogs published on the web is still increasing exponentially. Since the emergence of weblogging, education has taken an interest in the phenomenon as well, since weblogs have introduced opportunities for previously problematic reflective activity and dialogue, while feedback can be given by peers and teachers much faster (Wopereis, 2007). Several researchers have been examining the usefulness of weblogging in educational contexts. In most cases, these studies and pilot implementations have focused on knowledge creation and structuring of own work, using weblogs as a (self) reflection tool and as a tool for communicating with interns abroad.

Wikis / collaborative editing

The term wiki was first used in 1994 by Cunningham. He used this term for the online collaborative editing tool he developed, which today is known as a fully online open editable website. Users can visit, read, re-organise and update the structure and - primarily textual - content of the pages of a wiki in a web interface. All a user needs to edit and read a wiki, is a web browser. The most well-known example is the online encyclopaedia Wikipedia. Various studies have shown that wikis can provide a valuable tool for computer supported collaborative learning, CSCL (Augar, Raitman, & Zhou, 2004; Lipponen, 2002). However, most of these studies focus on text-based wikis, as this is also the main implementation of wikis today. However, while today broadband connections are more common, wikis could be used in technologically much more advanced ways. For example, the incorporation of collaborative visual or audio files in wiki systems could offer new opportunities for education, for example in art education. First studies indicate that incorporating visual (Augar, Raitman, & Zhou, 2004) functionalities can improve education.

---

2 http://en.wikipedia.org
Collaborative editing is finding its way into current education as well. Online services like Zoho and Google Docs\(^3\) offer users the opportunity to create, share and collaborate on documents, spreadsheets or websites. Educators are experimenting with these tools, e.g., to create e-portfolios for group work (Coutinho et al., 2008). Also, many (Dutch) higher education institutes work with Microsoft Sharepoint\(^4\), which allows teams to work together on team pages and documents. However, it seems that most only use this specific technology to share documents instead of editing them together online at the site itself.

**Instant messaging**

Instant messaging (IM) is the term used to describe the technology through which “users can set up a list of partners who will be able to receive notes that pop up on their screens the moment one of them writes and hits the send button” (Castelluccio, 1999). IM contrasts with synchronous chat, another often applied synchronous communication medium, since that is usually organised through publicly accessible chat rooms. While it has been available since the introduction of the internet through systems such as ICQ, its popularity has increased in the second half of the 90s via the rapid growth of the MSN Messenger system. Especially among teenagers, IM has become one of the most important communication means (PEW Internet, 2004; PEW Internet, 2005; Qrius, 2005), with its own culture and language. Through IM, teenagers communicate with their buddy friends, make appointments, date (PEW Internet, 2001), and collaborate on school tasks (Grinter & Palen, 2002). Teenagers do about everything online through IM, since “the buddy list is teens’ social world” (Boneva et al., 2006). Strangely enough, science and education have been doing very little with this development. Secondary schools in the Dutch city of Groningen have banned MSN for example from their school computers\(^5\). However, first studies indicate positive results for educational use of IM (Farmer, 2005). At the same time, it turns out that current students already use IM for tutoring activities among each other. When asked about the study activities they used IM for, the students came up with answers such as

---


discussing school tasks and course material with fellow students, and reflecting on each others work (De Bakker, 2007). At the same time, students indicate they do not need to be in contact with teachers via IM, they mainly use it for peer activities (De Bakker, 2007). Along this line, recently efforts have been made to introduce online reciprocal peer support systems using IM as the communication medium (De Bakker et al., 2008).

**Forums / communities / newsgroups / social networking**

Quite some research on educational technology of recent years focuses on networked learning. Various studies have provided insights in how communities with clear learning aims can be best structured and designed (Breiger, 2004; Kollock, 1998; Kollock & Smith, 1999; Koper, Rusman, & Sloep, 2005). Also, various insights are available on the various human interaction aspects in communities, for example on the issue of trust (Coppola, Hiltz, & Rotter, 2004), or roles community members in general (Kollock & Smith, 1996) and in educational settings (Kreijns, 2004; De Laat, 2005; De Laat & Lally, 2004) can have, and how these can be best facilitated (Kester et al., 2006).

In this context, the recent development of social networking (MySpace, Facebook, etc.⁶) is important. Many people see this as a separate form of social software, but they could be seen as communities without a required direct (learning) aim. It is an interesting development, even if we only look at its size. Surveys for example show that 60% of Dutch people make use of social networking communities⁷. Currently social networking is mainly used as a fun tool, but it is expected that it can facilitate informal learning, because communities are often based around a specific topic.

**Virtual worlds / gaming**

Recently much attention has been given to the rising popularity of virtual worlds and serious gaming. After a first hype, in which many educators started creating educational games or created classroom

---


⁷ [http://www.marketingfacts.nl/berichten/20060703_60_nederlanders_maakt_gebruik_van_online_sociale_netwerken](http://www.marketingfacts.nl/berichten/20060703_60_nederlanders_maakt_gebruik_van_online_sociale_netwerken)
environments in virtual worlds like Second Life, the first empirical studies on educational benefits now start to emerge. One example of the positive results that can be achieved with educational games is that of using gaming for history education (Huizenga et al., 2007).

**Social bookmarking**

Social bookmarking can be described as a web based service, where shared lists of user-created internet bookmarks are displayed. This not only offers users to store bookmarks online, enabling them to access them on any computer, but also allows users to share their bookmarks with other people. For example, I can provide another e-researcher with some of my links and see what he has been looking for recently. Although social bookmarking does not facilitate direct human-to-human communication and community building, it is usually described as social software as well. Well-known examples of social bookmarking services are Delicious and Furl. Only little research is available on social bookmarking in educational contexts, but indications are that it can indeed be a valuable tool (Alexander, 2006). Some examples of possible implementation would be incorporating a students’ bookmark list in his ePortfolio or publishing course literature lists in a social bookmarking service.

**Is all social software social?**

A risk in implementing new technologies suitable for education is that they loose the original social characteristics that are crucial to their web 2.0 status. In recent years for example, we have seen the emergence of the ePortfolio. Derived from the traditional portfolios in the arts fields, used to showcase previous work and skills, education is taking over this tool: a means for students to let others know what they have been doing and to learn from others’ experiences. Therefore in most social software overviews, the ePortfolio is being mentioned as well. It could, however, be questioned whether the current implementation of the ePortfolio in educational contexts is an example of the implementation of social software. Many institutions have

---

8 http://www.secondlife.com/
turned the portfolio into a new assessment tool, while neglecting its social and reflective possibilities.

**Substitution vs. transformation**

In looking at research and technological developments, it is useful to make a distinction between two types of social software implementation in education. De Wolf (1998) describes two categories for ICT innovation: substitution and transformation. Substitution is the category of innovations in which ICT enables existing processes to become more efficient, while transformation is used to describe the category of innovations in which ICT enables people to do new things that were not possible prior to the innovation. De Wolf uses his distinction for ICT in general, but the same goes for social software. Social software applications that are designed and implemented as a substitution can be defined here as applications that make existing processes in teaching or learning easier or more efficient. An example is an interactive writing course where students have to publish their texts on a weblog. Their fellow students have to provide feedback to these texts via the commenting functionality on the weblog. This is a more efficient version of its old counterpart where students give each other feedback on their paper texts in face-to-face situations. On the other hand, some social software tools can also be used for transformation towards innovative education. Some applications make things possible that could not or hardly be done before the emergence of web 2.0. The latter category might be the most interesting to take up in education, while the most valuable improvements are possible on the level of transformation.

**Resources**


Connectivism in Masters Level Courses:
Experiences Gained in Dunaujvaros through the
MOTIVATE Project
(Laszlo Kadocska - Gyula Guban)

Introduction

As little as forty years ago, learners would complete the required schooling and enter a career that would often last a lifetime. The life of knowledge was measured in decades. Today, these fundamental principles have changed. Knowledge is growing exponentially. In many fields the life of knowledge is now measured in months and years. Learning needs, and theories that describe learning principles and processes, should reflect underlying social environments. Formerly, education theories were developed when learning was not impacted through technology. However, over the last few decades, technology has reorganized how we live, how we communicate, and how we learn.

Connectivism is a learning theory which is driven by the understanding that decisions are based on rapidly altering foundations. New information is continually being acquired. Connectivism is the integration of principles explored by network, and complexity and self-organisation theories. The ability of the learner to draw distinctions between important and unimportant information is vital. Likewise, the ability to recognise when new information alters the landscape based on decisions made yesterday is also critical.

The aim of the professional experience in the Masters level training, as developed in the Motivate project, is to ensure that students acquire profession-related knowledge and skills, and pedagogical-related competencies. Getting to know the institute itself, and the way things work within this education environment, how to organize teaching-learning procedures, and acquire developing and analysing skills, are important for the teachers too.

In this case study we explain our training practice and experiences through the Motivate project developments. We look at new education theories, including conectivism, in more detail, and examine
ways of combining learning theory with professional practice; we consider how best to use new learning environments.

**Connectivism**

Some years ago many teachers and education policy makers thought that it was impossible to change the education strategy and the content of training, which had previously been established. However, changes occurred in the field of learning that transformed the position of education.

These are some of the significant trends observable in the learning process:

- Many learners will move into a number of different, possibly unrelated fields of study over the course of their lifetime.
- Informal learning is a significant aspect of our learning experience.
- Formal education no longer comprises the majority of our learning. Learning now occurs in a variety of ways – through communities of practice, personal networks, and through completion of work-related tasks.
- A wide range of new, free tools is at our disposal: blogs, wikis, forums and other tools that make collaborative content development possible.
- Learning is a continual process, lasting for a lifetime. Learning and work related activities are no longer separate.
- Technology is altering (rewiring) our brains. The tools we use define and shape our thinking.
- Many of the processes previously handled by learning theories (especially in cognitive information processing) can now be off-loaded to, or supported by, technology.
- Know-how and know-what is being supplemented with know-where (the understanding of where to find knowledge needed).

We can see that the internet community and electronic forms of communication have reached education. Students now interact with
self-developed media contents such as blogs, forums, web sites, which can be considered as uncontrolled sources of information.

Digitalization - which at first improved the content processing and communication by local medium – is now established areas of network communication:

- social learning based on web 2.0 and
- learner-centred web environments (e-learning 2.0)

Blended learning can be considered as an interim state, where the limit of space and time are realised by digital (off-line and on-line) technology- (CD-ROM, DVD). Earlier the role of blended learning was complementary to traditional (paper based) teaching materials but now its role is alternative in the learning process supported by ICT.

The characteristics of blended learning are: formal – informal, based on technology and human input, individual- and social-oriented, and involving collaborative or self-learning forms. Blended learning ensures that the learning process would be the most successful.

This means that we have to reconsider previous definitions of e-learning because of the appearance of e-learning 2.0. We have to reconsider the organisation of learning-teaching processes, how to put teaching material into a standard framework, how learners will learn/benefit from it, and last but not least, what will be the role of teacher in the new education environment.

We could interpret e-learning 2.0, based on Web 2.0, as a form of learner centred, irregular learning which is based on the learners’ autonomy and spontaneous knowledge transformation. E-learning 2.0 does not have hierarchical structure but it has a multi-sided, decentralized one, which inspires the students to collaborative learning and which helps to promote the creativity of students. Due to the web 2.0, the bottom up learning approach became very strong in the past few years. This trend has reached e-learning and sometimes we refer to it as a e-learning 2.0, sometimes as connectivism.

We should realize that new network learning paradigm of ICT has been present among the students for many years. Concerning new ICT and the e-learning 2.0 we have yet to discover how suitable they are to answer the challenges of life long learning and this new methodology.
Behaviorism, cognitivism and constructivism are key to education methodologies. All three theories were developed at a time when learning was not impacted through technology. The internet and ICT have made a great impact on education, the network characteristic of content comes to the fore, as can be seen in web text with hyper references.

Behaviorism states that learning is largely unknowable, that is, we can’t possibly understand what goes on inside a person (the “black box theory”). Gredler (2005) expresses behaviorism as being comprised of several theories that make the following three assumptions about learning:

- Learning is about behaviour change
- Observable behaviour is more important than understanding internal activities
- Behaviour should be focused on simple elements: specific stimuli and responses

Cognitivism often takes a computer information processing model. Learning is viewed as a process of inputs, managed in short term memory, and coded for long-term recall. Buell (2004) details this process: “In cognitive theories, knowledge is viewed as symbolic mental constructs in the learner's mind, and the learning process is the means by which these symbolic representations are committed to memory.”

Constructivism suggests that learners create knowledge as they attempt to understand their experiences (Driscoll, 2000). Behaviorism and cognitivism view knowledge as external to the learner and the learning process as the act of internalizing knowledge. Constructivism does not assume that learners are empty vessels to be filled with knowledge. Instead, learners are actively attempting to create meaning. Learners often select and pursue their own learning.

Connectivism, forming the basis of e learning 2.0, is the integration of principles explored by network, complexity and self-organization theories. Learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is
focused on connecting specialized information sets, and the connections that enable us to learn are more important than our current state of knowing. This learning theory gives insight into learning skills and tasks needed for learners.

Principles of connectivism:

- Learning is a process of connecting specialized nodes or information sources. Learning and knowledge rest in a diversity of opinions.
- Learning may reside in non-human appliances.
- Capacity to know is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intention of all connectivist learning activities.
- Decision-making in itself is a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision [1].

Maintaining these connections then becomes a learning skill that is essential for learning in a technological information society. The above mentioned principles of connectivism that Siemens then defines can be divided into four categories:

- Educational aims for the curriculum
- Premises for the curriculum
- Learning processes that are to be facilitated when putting a curriculum into practice
- As a separate category

The first three categories in combination appear to confirm the notion that connectivism is a pedagogical view. The learning process mentioned is not at all new, but plays an important role in our professional training.
The starting point of connectivism is the individual. Personal knowledge is comprised of a network, which feeds into organizations and institutions, which in turn feed back into the network, and then continue to provide learning to the individual. This cycle of knowledge development (personal to network to organization) allows learners to remain current in their field through the connections they have formed.

Including technology and connection making as learning activities begins to move learning theories into a digital age. We can no longer personally experience and acquire learning that we need, in order to act. We derive our competence from forming connections.

Connectivism is the fourth learning theory after behaviourism, cognitivism and constructivism. It is often referred to as a learning theory of the digital age, linked to the names George Siemens and Stephen Downes [2]. Among the characteristics of connectivism we could mention that the learning and knowledge lie within the diversity of opinions. Learning is a kind of process where special nodes join with the information sources. Learning may reside in non-human appliances. (Learning is characteristic not only to the human being.) To gain new knowledge is more important than existing knowledge. (The capacity to know more is more critical than what is currently known.) We learn more and more through promoting connection.

The next table compares the four learning theories:

<table>
<thead>
<tr>
<th></th>
<th>Behaviorism</th>
<th>Cognitivism</th>
<th>Constructivism</th>
<th>Connectivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style of learning</td>
<td>Behaviour centred, observation</td>
<td>Modelling, structuring</td>
<td>Social product</td>
<td>Based on network</td>
</tr>
<tr>
<td>Knowledge transformation</td>
<td>Stimulus, response</td>
<td>recalling</td>
<td>socialisation</td>
<td>Join to exist knots</td>
</tr>
<tr>
<td>Situation of learning</td>
<td>Task oriented learning, class work</td>
<td>Problem solving, clear tasks</td>
<td>Essay, open ended tasks</td>
<td>Notes network, summarizing study</td>
</tr>
</tbody>
</table>

The notion of connectivism has implications in all aspects of life, but the following aspects are particularly noteworthy:
• Management and leadership. The management of resources to achieve desired outcomes is a significant challenge. Realizing that complete knowledge cannot exist in the mind of one person requires a different approach to creating an overview of the situation.

• Media, news, information. This trend is well under way. Mainstream media organizations are being challenged by the open, two-way information flow of blogging in real-time.

• Personal knowledge management in relation to organizational knowledge management

• Design of learning environments

**The learning process and connectivism in engineering teachers’ methodological studies and professional experience**

Imagine that the knowledge in our head is a network where the knot is the smallest unit (like notion, sentence) and the edge shows the associative connection. In this system the learning means: join a new knot to the network of learning means to organise new relation (edge).

It is easy to see that there are some important knots in our network which join, with many edges, to other points of the network and there are points which are not so important, which join by fewer edges to the other knots.

The learning process consists of building the network and creating new edges and knots [3].

Learning knots in the network theory
The highlighted knots represent those basic structures which determinate our way of thinking. They define elements of knowledge such as ‘rules of nature and logic’ or ‘orientation of ethic’. If we study the learning in this system we can see that the joining of new knots is possible in two ways:

- we can join to the existing knowledge (association) or
- we can learn by repetition which joins to the existing knowledge network in a loose manner

As a consequence of the above points, the richer our previously gained knowledge is, the more we have to endeavour to the associative connection.

The intention was to use this kind of learning theory/strategy during the MA course, in the implementation of the Motivate common modules, since 90% of the students are practicing teachers. They have a great many useful experiences which they can share with other colleagues and also gain new knowledge during these sessions.

In the learning process we must emphasize the importance of establishing the personal learning environment. New Personal Learning Environments appeared as a helping tool for the cross-institutional education, enabling students to:

- work within more LMS systems,
- write blogs
- manage their own portfolios
- observe the content of many websites in one place (RSS) [4],

The students must simply create their own learning environment, through which they can join to the teaching framework of their choice.

What are the main attributes of the LMS and PLE systems?

<table>
<thead>
<tr>
<th>LMS</th>
<th>PLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institution functions</td>
<td>Learning tasks</td>
</tr>
<tr>
<td>Institutional categorization</td>
<td>Student formed categorization</td>
</tr>
<tr>
<td>Teacher based education</td>
<td>Student based education</td>
</tr>
<tr>
<td>Closed system</td>
<td>Opened system</td>
</tr>
<tr>
<td>Formal, inflexible architecture</td>
<td>Flexible architecture</td>
</tr>
</tbody>
</table>
The aim of the professional experience within MA training is to ensure that students acquire profession related knowledge and skills, and pedagogical related competencies (how to prepare for classes, how to plan and run classes, how to behave as teacher, to analyse and experiment, getting to know the institute itself and the way things work within this education environment (school life, school programmes, teacher-parent relationship, school leadership, etc.), how to organize teaching-learning procedures and to acquire developing and analysing skills).

The professional experience can be divided into three main cycles. All items concerned with the three cycles’ activity, tasks and resolutions, analyses have to be included in the portfolio prepared by the student. The portfolio is part of the teacher qualification exam. The first 2 cycles are related to special subjects methods, and the 3rd cycle is to comprehensive pedagogic experience.

During the first phase students get to know the teaching profession, and the methods of developing pedagogical skills. These competencies will be implemented in the professional modules of didactic, psychology and methodology. (These practical tasks mainly consist of profession knowledge, self-training, conflict solving, school visit and micro teaching). This practice involves the work out and practical application of the thematic plan of a chosen topic. The analyses, tasks, solutions and evaluation obtained during the training will be part of the portfolio. The trainers of these professional subjects and also the teachers of the practicing schools will provide methodological assistance.

The goal of the second cycle practice is to provide an opportunity for the students to develop their competencies needed for the practicing of their profession, and described in the professional requirements.

The goal of the third cycle practice is to provide an opportunity for the students to develop their competencies needed for the practicing of their profession, and described in the professional requirements. These key competencies can be developed during the training in different ways.

The training period (last semester of the course) is a coordinated professional experience led by a lead trainer and a dedicated department expert in a suitable educational institute (adult training
school. This experience involves the class visits (max. 10 lessons), the teaching practice (2-5 lessons/week) and the completion of seminars following the teaching period and data collection.

The half-year long practice provides an opportunity for the development of all these competencies described in the educational requirements. By the selection of assignments needed to be considered, the activities of the competencies belonging to the second group should be emphasized.

Within the frames of Motivate project we made the first steps of MA teaching when we applied certain elements of network teaching, especially the use of forums.

In this work it was a significant help that Stephen Downes and George Siemens have launched a course on connectivism supported by web 2.0 tools. It was useful to review their curriculum because it was not a traditional curriculum. It did not contain learning materials and a learning management system. Instead it has different learning solutions such as facebook, wiki, forum, blog, RSS, moodle, group, etc.

The foundation of a methodology best practice collection has started. It means teaching solutions discussed on different teaching forums will be uploaded to the network – thus helping other teachers with source materials.

These practicing periods and the teaching theories, methodology subjects related to them and also the tasks to be resolved, provided a good opportunity for organizing courses based on new learning theories, e.g. work out of teaching plans and thematics, creating daily e-mail archives, teacher reflexions, presentations, etc.
References

<http://www.elearninspace.org/Articles/connectivism.htm>
SIEMENS, George: Comparing Connectivism, Connectivism & Connective Knowledge, 2008,
http://ltc.umanitoba.ca/connectivism/?p=101

Instructional Technology and Distance Learning 2005


Master Level Opportunities for the Greek TEIs
(Haris Papoutsakis)

Introduction

The Technological Education Institutes (TEIs) have only recently, under Greek Law 3685/2008, been granted the right to develop Master level studies independently or in cooperation with other Greek or foreign Institutes of Higher Education (IHEs). These programmes lead to a Postgraduate Diploma of Specialisation, which is the official name of a Master’s degree in the Greek language.

The paper first takes a close look at the brief history of postgraduate study programmes in Greece, prior to the implementation of Law 3685/2008 as well as the fundamental tendencies regarding Master level studies that have been noted in Europe after the Bologna Accord. Then, it looks at the axes that have guided the Greek TEIs in their effort to create their Master level studies Strategy and to define the Action Plan that will allow them to successfully face the local and international competition ahead of them. Furthermore, it focuses on certain issues – approval, academic regulations, programme of studies and sustainability – that are essential for the development of Master level studies programmes under the new framework. Finally, as financing is a critical issue, a quick reference is made to the three sources of funding for the new Master level studies programmes anticipated by the Law 3685/2008.

Background

The actual chart of postgraduate studies in Greece has very recently changed under the Law 3685/2008, which granted to the Greek TEIs the right to develop Master level studies programmes independently or
in cooperation with other Greek or foreign IHEs. Up until 2008, Greek TEIs were only permitted to participate in joint postgraduate programmes, where a foreign or Greek IHE granted the Master’s degree or the Postgraduate Diploma of Specialisation, which is the official name of a Master’s degree in the Greek language. The following table illustrates the situation in the Greek Master level studies arena at the end of the year 2008:

<table>
<thead>
<tr>
<th>Mode of Operation of the Greek Master level Study Programme</th>
<th>Number of Programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Greek Universities and TEIs</td>
<td>44</td>
</tr>
<tr>
<td>Between Greek and foreign IHE</td>
<td>34</td>
</tr>
<tr>
<td>Between TEIs and foreign IHE</td>
<td>24</td>
</tr>
<tr>
<td>Between Greek IHEs</td>
<td>460</td>
</tr>
<tr>
<td><strong>Total</strong> between Greek or foreign Universities and TEIs</td>
<td><strong>562</strong></td>
</tr>
<tr>
<td>Within the above total</td>
<td></td>
</tr>
<tr>
<td>Inter-departmental (same or different IHE)</td>
<td>124</td>
</tr>
<tr>
<td>Inter-Institutional</td>
<td>87</td>
</tr>
<tr>
<td>With tuition fees</td>
<td>223</td>
</tr>
<tr>
<td>Without tuition fees</td>
<td>295</td>
</tr>
</tbody>
</table>

**Source:** Data base of the TEI of Crete

| Table 1. Greek Master level studies programmes (year 2008) |

Before 2008, apart from participating in joint postgraduate programmes, the Greek TEIs’ academic staff participated in postgraduate courses run by Greek or foreign IHE and supervised Doctoral Theses, developed in their laboratories, by external doctoral students. Under this new perspective, Greek TEIs have to act with prudence in order to avoid ‘two speed’ postgraduate studies –at the Universities and the TEIs– and to prepare themselves for Master’s courses in the English language. The later will enhance their extroversion and the competitiveness of their students, while, at the same time, shall attract foreign students.

In the traditional as well as the new European countries three different trends have been noted, concerning Master level studies, after the Bologna Accord:

- Applied Master level studies, or Professional Master’s degrees, which are designed towards the specialized knowledge that is
required for the profession and promises a quick merging in the labor market.

- Academic Master level studies that are designed with an orientation towards research or the preparation for it, possibly through a Doctoral study (i.e. MRes, etc.)
- Master level studies that do not clearly indicate their character or orientation.

According to a study by Stamelos and Dakoloulou (2007): True and systematic distinction between academic and professional Master’s exists within certain European countries (France, Holland, Italy, Latvia, and Sweden). In Germany and Norway there is a distinction that very little affects the studies’ orientation and occupational prospects. Almost no distinction between academic and professional Master’s is noted in the majority of the countries that have signed the Bologna Accord (Austria, Bulgaria, Cyprus, Czech Republic, Denmark, Finland, Hungary, Iceland, Ireland, Malta, Poland, Slovakia, Switzerland and the United Kingdom).

Law 3685/2008 may be conceived as a step towards compliance with the Bologna Accord which was signed by the education ministers of 29 European countries in Bologna, in June 1999. Its ultimate goal is to create a common European Higher Education Area by 2010 with a view to improving the competitiveness and appeal of European higher education in relation to other continents. The main means to this end are the following two objectives:

- Easily legible and comparable degrees. The foremost tools for achieving this are ECTS (European Credit Transfer System) and the Diploma Supplement.
- Uniform degree structures. The degree structure will be mainly based on a two-cycle model. The first cycle, with duration of three or four years, leads to a Bachelor-level degree. The second one lasts two or one year, accordingly, and leads to the Master's degree, while the Doctoral studies, lasting for three years, are placed in a third cycle.

Greek TEIs have long ago adopted the ECTS system and, lately, most of them have added the Diploma Supplement as an annex or explanatory note attached to the diplomas granted. It elucidates the diploma, which may often be understood only within the issuing
country. When properly completed, this document provides all the information necessary for a valid assessment of any degree or qualification.

**Defining a Strategy**

Greek TEIs are currently confronted with the challenge to create their Master level studies strategy and to define the Action Plan that will allow them to successfully face the international competition ahead of them. The following five axes, ambitious but still very realistic, have guided the Greek TEIs in their effort to design competitive Master level studies programmes:

- Global integration and international mobility have increased rapidly in the past decades. As a consequence, new and exciting opportunities for Greek TEIs’ graduates are emerging.
- Southeastern Europe and some nearby Asian nations are growing and their global influence is increasing. The Greeks need to become the ‘Literate of Southeastern Europe’, undertaking and building strong relationships within this rapidly developing area.
- Globalization and technological change are placing strong demands on education and skill development in Europe and the nature of jobs available to young Greeks is changing faster than ever. Skilled jobs now dominate job growth and people with university or vocational education and training qualifications cope much better in the employment market than early school leavers. To maximize their opportunities for healthy, productive and rewarding futures, young Greeks must be encouraged not only to complete university education, but also to proceed into further Master level studies.
- Complex environmental, social and economic pressures, such as climate change, which extend beyond national borders pose unprecedented challenges, requiring countries to work together in uncharted paths. To meet these challenges, we must be able to engage with scientific concepts and principles, and approach problem-solving with fresh, creative techniques.
- Rapid and continuing advances in information and communication technologies (ICT) are changing the ways people share, use, develop and process information and technology. In this digital
age, young people need to be highly skilled in the use of ICT. While Greek TEIs already employ these technologies in learning, there is a need to increase their effectiveness significantly over the next decades.

Law 3685/2008 itself sets some preconditions for the TEI departments intending to propose Master level studies programmes. The most critical one calls for the department to have successfully passed, or at least submitted, its Report of Internal Assessment. The relative Quality Assurance process was first applied during the academic year 2007-8 and has been completed by the majority of the Greek TEIs’ departments. They also have to complete, promptly, their institutional infrastructure, which means: compilation of a Master Level Studies Guide; creation of the academic administration structures; establishing adequate Students’ Provision facilities, etc. Alongside with the Ministry of Education (MoE) that has to establish a joint public body that will judge all the applications for Master level studies programmes, independently of their TEI or University origin.

Law 3685/2008 anticipates three sources of funding for the new Master level studies programmes: state, Community Support Framework and the Institution’s budget. The possibilities offered through each one of the sources are briefly presented, here below:

- Due to the economic crisis, no additional state funding has been announced for the new Master level studies programmes but this may very well change in the near future.
- In the Community Support Framework funds and particularly through its Operational Programme “Education and Life-long Learning” there are funds that have to be properly allocated to the selected Master level studies programmes, during the pilot years 2009-2013. In addition, the Erasmus Mundus programme provides financial support for institutions and scholarships for individuals. This funding is available for European joint masters and doctoral programmes of outstanding academic quality, which are designed and implemented by a consortium of European universities from at least 3 different countries. Consortia may also include universities from other parts of the world. Scholarships and fellowships are open to higher education students and academics from all over the
world. Programmes include obligatory study and research periods, in at least two universities, and award recognized double, multiple or joint degrees.

- Institutional funding includes its own budget, sponsors, research programmes and, of course tuition fees. Higher Education today in Greece is public and gratis; for this reason any necessary tuition fees for the new Master level studies programmes must be limited to expenses related to the actual cost of studies.

It is obvious that only through the best possible, combined funding the new Master level studies programmes may be successfully financed through their first, difficult years of operation. Later on, their financial situation is expected to significantly improve.

The Action Plan

We believe that a clear agreement, between the MoE and each one of the Administrations of the Greek TEIs is very essential for the successful completion of the project. It will be supported by a series of action plans, commencing with one for the pilot years 2009–2013. This first action plan must outline the strategies and initiatives that the MoE, in collaboration with the TEIs, will undertake in order to support the Master level study programmes under consideration. In addition:

- It must be conceived as a chance of scientific and educational interaction amongst departments of relative or diverse orientation, within the same IHEs or not.
- Attention is due to the sustainability of the proposed Master level studies programmes. Issues like their appeal to TEI and other IHE graduates, the employability chances of the new Master’s holders and the availability of funds at the time they will be required.
- Every new Master level studies programme has to comply with the existing educational and research structures of the applying TEI. It must not, under any circumstances, compete with existing graduate curricula and must take into consideration availability of posts, within the TEI, for Master Dissertations to be developed.
Action plans should be part of an on-going procedure based on standard commitment to Master level studies that will encourage best practices in education and enable IHEs to share and apply their knowledge. With such an approach the Greek government and the IHEs will share the costs and benefits of reforms to give every Greek TEI graduate a real chance of becoming a successful professional, a confident and creative individual and an active and informed citizen.

As we foresee that numerous innovative Master level studies programmes will be developed by the Greek TEIs, we propose to hold a biennial national forum to evaluate the achievements of the educational goals set and to exhibit the best practices across the country. The MoE or the Assembly of the Greek TEIs Presidents are most suitable to jointly convene such a forum.

**Conclusions**

Success of the above defined strategy for the implementation of the new Master level studies programmes at the Greek TEIs is contingent on full commitment on the part of all stakeholders involved. IHEs bear a major responsibility for the implementation and further development of the project. Apart from the Greek government, who has the responsibility to provide the framework conditions appropriate, the involvement of academics, administrative staff and students is of crucial importance to this process.

Academics are faced with the challenge to design world class Master level Curricula that will nurture successful professionals, confident and creative individuals and active and informed citizens. They also have to support the development of deep knowledge within a discipline, which provides the foundation for inter-disciplinary approaches to innovation and complex problem-solving. On accomplishing the above, Greek graduate students –from TEIs or other IHEs– will eventually abandon their long standing tendency to resort to other European countries for Master level studies.

Every TEI Council is responsible for creating and sustaining the learning environment and the conditions under which quality teaching and learning take place. They have to play a critical role in supporting and fostering quality teaching through coaching and mentoring.
teachers to find the best ways to facilitate learning, and by promoting a culture of high educational and cultural expectations in the Greek TEIs.

The Government needs accurate information on each TEI’s performance in order to support their ongoing improvement. Good quality data will enable the government to identify TEIs with particular needs, determine where resources are most needed to lift attainment. Furthermore, it will thus identify best practice and innovation, conduct national and international comparisons of approaches and outcome and will finally develop substantive evidence on what works and what needs to be changed.

**Resources**


Career Office, TEI of Crete. At http://www.career.teicrete.gr


Educating Innovative Entrepreneurs: Graduate and Master Level Courses for the Greek TEIs
(Haris Papoutsakis)

Introduction

Two are the main objectives of this paper: first, to investigate the historic evolution of the innovative entrepreneurial phenomenon of the eighties under the prism of today’s knowledge economy environment; and second, to look at innovation and entrepreneurship, supported by advanced Information and Communication Technologies (ICTs), as possible courses for the revised graduate and new Master level curricula at the Greek Technological Educational Institutes (TEIs).

Authors of 1980s’ business management books tended to perceive entrepreneurs as the individuals who create a new small business that flourish and generate new employment. But the evolution of knowledge and its management, supported by ICTs, have drastically changed the prism under which entrepreneurial businesses are scrutinised. Innovative entrepreneurs, in the 21st century, are considered as the individuals who destroy the existing economic order by introducing new products and services, by creating new forms of organisations, or by exploiting new materials. Taking risks and making the right decisions, under uncertain conditions, have always been recognised as key entrepreneurial qualities.

The above ‘new’ profile of the entrepreneur has lead academics to change their previous posture and accept that innovativeness and entrepreneurship, besides being talents, are also subjects that can be taught. The paper proposes innovation and entrepreneurship courses, supported by ICTs, to be included in the revised graduate and new Master level curricula of the Greek TEIs, and, based on experiences gained through the two Leonardo funded projects (VELVITT and MOTIVATE), further proposes the introduction of the topic to the teacher education curriculum.
**Background**

Innovation is an ancient art, probably as old as 500,000 years, but managing innovation is a relatively young management technique, only a few decades old, and has received much less attention than other aspects of innovation such as creativity, entrepreneurship or venturing. Understanding innovation as a business process and how it has developed through history is very essential to entrepreneurs aiming to a well-managed innovation effort (Verloop, 2004).

It has been universally acknowledged that as of the 1980s we are living into an entrepreneurial age. Entrepreneurs are guiding a revolution that is transforming and renewing economies all around the globe. But who are the entrepreneurs? The term, which most people understand as denoting someone who organises and assumes the risk of an innovative business in return of profits, was first introduced early in the eighteenth century by Richard Cantillon (1697-1734), an Irish economist with French ancestors. But it only won broader acceptance at the beginning of the twentieth century. Joseph Alois Schumpeter, at that time a young professor at the University of Graz in Austria, defined an entrepreneur as the person who destroys the existing economic order by introducing new products and services, by creating new forms of organisations, or by exploiting new materials. According to Schumpeter (1951), this ‘creative destruction’ could be accomplished by founding a new business, or within an existing one. But still, right after World-War II, entrepreneurship was only seriously discussed within a small group of academics involved in the study of ‘small businesses’. For many others, entrepreneurs were people who start their own business in order to avoid getting a job!

Building upon experiences developed in the Greek and Portuguese MOTIVATE partner institutions, in this paper we perceive innovative entrepreneurship as the mechanism by which new products and services enter the economy and create growth. In the following section we concentrate on innovation and entrepreneurship from the economic theory perspective under which entrepreneurs obtain a sense of purpose and accomplishment, and are recognized as the persons who perceive an opportunity and create an organisation to pursue it.
Shifting away to more practical issues on small business studies, in section three, the paper examines a number of personal, sociological, and environmental factors that have influenced small business start-ups in the eighties. Start-up capital and leadership are also examined in this section. The term ‘small business’ is used in place of the phrase ‘small- to medium-sized enterprise’ (SME) introduced by the EU administration.

As Information and Communication Technologies (ICTs) are considered among the key variables that are driving competitiveness and a factor with which innovative entrepreneurs can distinguish themselves from their competitors, section four is devoted to this issue, with special focus on the particular ICTs’ tools made available, today, to entrepreneurs. In section five, after focusing on the close link between entrepreneurs, innovation, and the acquisition of technological knowledge by entrepreneurial companies, we proposed new graduate and Master level courses that will better educate the innovative entrepreneurs of the 21st century. Finally, our conclusions are drawn under the perspective that innovative, entrepreneurial organisations work in today’s global economy.

The Economics of Innovative Entrepreneurship

Economy is a human establishment that strives to achieve certain goals; to satisfy the material and social needs of people, and to create conditions for satisfaction of intellectual needs as well. Thus, economic activity is inconceivable without leaders, whose function is to identify and set goals, and accumulate resources to achieve these goals at their own risk. Entrepreneurs are the natural leaders of the economic life and of the industrial world. However, one-sided knowledge of economic processes and phenomena is not sufficient to maintain such a leadership in the long run. Narrow-minded specialists with partial education cannot successfully lead complex undertakings, such as economic ventures and holding companies. Entrepreneurs, as true leaders, have to be the specialists on much broader issues of life.

The value of innovation can be assessed as an option value in creating intellectual capital for the company. Integrating sustainable development in the innovation process requires changes in the management process, in the assessment and valuation of innovation,
and in the interaction with the stakeholders. Entrepreneurship is the key resource in innovation and the right conditions have to be created for it to flourish in large companies.

The economics of entrepreneurship are very important to the economic development and social welfare of a nation, as they affect the two major questions: how a society creates new wealth and how this is distributed among its members (Kirchoff, 1994). Continuous increase of a society’s overall wealth is increasing its standard of living and a fair wealth distribution is necessary for the stability of the given society. Obviously, wealth creation and distribution are considered fundamental to the socioeconomic progress of any nation and, as we shall demonstrate in this paper, entrepreneurship has an important role to play as one of the major mechanisms for ensuring these two economic transactions.

We shall resort to economic theory in order to better clarify the importance of innovative entrepreneurship in today’s economy. Under the neoclassical perspective –many buyers and many sellers who interact so as to ensure that supply equals demand– the entrepreneurs were practically deleted. Neoclassical theory, which does not take for granted the origin of ‘new demand’, has always had its critics; many classical economists objected to the absence of entrepreneurship from the neoclassical model. It was the classical capitalism theory –owners of land, buildings, machinery and capital can create profits for themselves– that spawned entrepreneurship and gave to entrepreneurs a sense of purpose and accomplishment. It was Schumpeter, now teaching at Harvard, who first saw innovation –the use of an invention to create a new commercial product or service– as the driving force for creating new demand for goods and services. According to Schumpeter, entrepreneurs start their business with little personal assets and the ambition to create wealth for themselves taking advantage of innovations that challenge the established few suppliers who dominate the markets. He called this process ‘creative destruction’ because entrepreneurs create new wealth through the process of destroying existing market structures (Schumpeter, 1951).

Finally, at the end of the twentieth century the vagueness around entrepreneurship was elucidated. Since 1979, the year that David Birch, the MIT business demographer, published results of an
economic analysis demonstrating that “small firms dominate job creation and economic growth in the United States”, entrepreneurs are considered the creators of wealth through innovation; they are at the centre of job and economic growth; they are believed to represent a mechanism of fair wealth distribution that depends on innovation, hard work and risk taking.

**Critical Factors**

Are innovativeness and entrepreneurship talents or ‘sciences’ that can be taught? Although as recently as in the mid eighties many academics maintained that entrepreneurship could not be taught, it needed less than ten years for it to become a very fast-growing subject in the major business schools curricula. The process of creating a new, innovative business is well understood and, thus, it can be taught; even at the People’s University of Beijing, courses on free enterprise and entrepreneurship were introduced early in the nineties. Moore (1986) presented a model of the entrepreneurial process that starts with the innovative idea of the entrepreneur and is almost always followed by a triggering event that gives birth to a new organisation that will implement the idea, in the hope that significant growth will eventually close the circle of the model.

Successful innovative entrepreneurs are a driving force in the growth of economies; they ‘are instrumental to the conception of the idea of an enterprise and its implementation’ (Kets de Vries, 1996, p. 856) and the ‘innovators and catalysts of change who continuously do things that have not been done before and do not fit established societal patterns’ (Schumpeter, 1965). Bygrave, to whom “the entrepreneurial process involves all the functions, activities, and actions associated with perceiving opportunities and creating organizations to pursue them” (1994, p. 2), recognizes a number of personal, sociological, and environmental factors that are critical upon establishing a new enterprise. Whether or not the entrepreneur will go ahead with his innovative idea and will create a new business, very often depends on factors like family status, role models to which he/she is exposed, alternative career options, the economical situation and, last but not least, the availability of resources.
It was first McClelland (1961) who, in an effort to answer the typical question ‘Do we have the right stuff to be an entrepreneur?’ maintained that entrepreneurs have a higher need for achievement than non-entrepreneurs, and that they were moderate risk takers. Bygrave (1994), despite his affirmation that there is no neat set of behavioural attributes that allow researchers to separate entrepreneurs from non-entrepreneurs, admits that entrepreneurs have a higher internal locus of control of their own fate.

External, environmental influences are considered as important as the personal attributes for a would-be entrepreneur. Some distinct areas of the world are definitely more entrepreneurial than others. The region of East Cambridge that is adjusted to MIT was characterised as ‘The Most Entrepreneurial Place on Earth’ by *Inc.* magazine and the Stanford University sociologist Everett Rogers (1984) explains in a very vivid way why so many people around her school catch the bug she names *Silicon Valley Fever*. Having successful entrepreneurs into their close home or work environments is another strong factor that generates the desire to would-be entrepreneurs to become one, as well. Bygrave (1994), reports that at Babson College, where he teaches, more than half of the students studying entrepreneurship come from families that own businesses. On the contrary, Schumpeter (in his 1942 classic, *Capitalism, Socialism and Democracy*) noted that the children and grandchildren of successful entrepreneurs, precisely the people with the right DNA, are very often seduced by inherited wealth and occasionally fail as second generation entrepreneurs.

Finally, there are some sociological factors, connected with the entrepreneur’s age and family responsibilities that play an important role in the decision of a would-be entrepreneur to start a company. Career decisions are much easier for a person in his mid twenties to take, than for somebody in his mid forties, with family, children and the accompanying responsibilities.

**Start-up Capital and Leadership**

Raising the start-up capital needed in order to get the business generate a positive cash flow, was another critical question that needed to be answered by the innovative entrepreneurs of the eighties.
Some striking examples, where young entrepreneurs started their small business with very little start-up capital have been given special attention: Olsen and Anderson started DEC with only 70,000 US $ and built a company that ranked in the top 25 of Fortune 500. Jobs and Wozniak used as start-up capital for Apple the 1,300 US $ raised by selling Job’s Volkswagen and Wozniak’s calculator. But for the majority of the entrepreneurs, having exhausted their personal savings and those of their family or friends, there are two options left: debt or equity. Entrepreneurs who choose debt start-up capital maintain total business ownership but are burdened with bank interest and eventually have to pay back the initial capital. Those who choose equity prefer to give up some of the business ownership in order not to have to repay the start-up capital.

Leadership is another behavioural attribute that largely differentiates the entrepreneur from the non-entrepreneur. Human resource management researchers distinguish two roles that an effective owner-manager of a small business should undertake. The charismatic role that is often split into envisioning, empowering and energising and the architectural role involving the design of the organizational structure and the setting of the appropriate control and reward systems (Kets de Vries and Balazs, 1999). The ability of the entrepreneur to balance amid these two roles appeared critical for the success of the enterprise as each one affects different functions of the organization.

In the previous sections, we have completed our retrospective analysis of the entrepreneurial phenomenon of the eighties. We have taken a close look at the economics of innovative entrepreneurial companies and examined a variety of factors that are considered critical for their start-up. As we are now aiming to take a close look at the above raised entrepreneurial problems in the frame of today’s knowledge economy environment, we shall first define a certain number of ‘knowledge domains’ in which the entrepreneur can take advantage of certain advanced ICTs made available today. Beijerse (2000) defines three such domains: organisation, marketing and technology. Knowledge in the organisation can be applied to all levels of management –strategic, tactical and operational–, policies, company culture, and human resources. Knowledge, in the area of marketing, can be related to markets, competition, customers, sales, distribution channels, and target groups. Finally, technological knowledge is closely associated
with core competences, product research and development, information and communication technologies. The importance of ICTs in the efforts of the would-be entrepreneur to triumph over these knowledge domains, leads us to take a closer look at the links between ICTs and entrepreneurship in the following section.

Information and Communication Technologies

In modern entrepreneurial or not organizations, effective use of Information and Communication Technologies (ICTs), is considered among the key variables that are driving competitiveness. Consider the competitive battles that are fought every day in marketplaces in every region of the world among Ford, GM, and Toyota; IBM, Hewlett-Packard and Dell; Microsoft and Netscape; Exxon, BP and Shell; Deutche Bank and Citigroup; and many thousands of other companies, from gigantic multinationals to small businesses. They compete on the value that their products and services offer to customers, including their benefits based on the technical features, and the cost effectiveness that allows them to competitively price these offerings. The efficiency to which technology can be introduced, developed and managed is of major consideration in competitive environments and hence in determining which companies will be the winners and losers in every market.

Applegate, McFarlan & McKenney (1999; p. vii) identify Information Technology (IT) as: “…computing, communications, business solutions and services…” and emphasize on the implications of the information explosion, bringing up the example of the rapid expansion of the number of volumes in the Library of Congress. Indeed there was a doubling between 1933 and 1966, a second between 1967 and 1979, and yet another doubling by 1987. And further down (note in p. 3) they explain that “…IT refers to technologies of computers and telecommunications (including data, voice, graphics, and full motion video).”

ICTs is not an end in itself. It is a means to the end of entrepreneurial business competitiveness and performance and one of the organisation’s key resources. As such, ICTs needs to be planned and
exploited within the context of the entrepreneurial organization in which it is deployed.

The current MOTIVATE project exploits the use of ICTs in the form of innovative technologies and continues work started in the VELVITT (2003-2005) project, with partners from Finland, Greece, Holland, Hungary, Portugal and the United Kingdom. The earlier project, as reported by Papoutsakis (2007), developed common modules using the technology aspect of virtual learning environments, which provide facilities for learning management tools, online learning frameworks, collaborative learning environments, web course design tools, etc. Both the software and the courses developed reside on a server and are designed to manage or administer various aspects of learning, delivery of materials, student tracking, assessment etc. Training material was developed for three common modules: 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 it could be integrated into existing teaching and learning timetables.

**Innovative Entrepreneurship and ICTs**

In accordance with the aim of our investigation, we shall now focus on the best ways entrepreneurial organizations can use ICTs in order to better support their work and, at the same time, positively improve performance. We will build this section upon the second finding of ‘The Management in the 1990s Research Program’ of MIT (Scott Morton Ed., 1991, pp. 13-14) stating that: “IT is enabling the integration of business functions at all levels within and between organizations.” The continuing expansion of public and private telecommunication networks means that any information, at any time, anywhere and any way corporate managers would like to look at it, could be made available, in most cases, at a reasonable cost. This enormous sped-up in the flow of work is made possible by the electronic network, in a number of ways.

- Within the manufacturing area, at both ends of the value chain. Using Local Area Networks (LANs) many entrepreneurial organizations are connecting design, manufacturing, R&D, quality
and purchasing, thus creating a real team focusing on one product. In principle, with the use of tools like chat, e-mail, e-conference, and groupware there is no part of an organization that is excluded from this team concept. LANs have grown from a rarity in the mid-1980s to the common means of high-speed, intra-office communications among members of work groups who use personal computers.

- As wireless data communication continues to grow in corporations, Wireless Local Area Networks (WLANs) which allow for computers to connect to the Internet without the use of a cable, also grow in usage. The main advantage is that they provide always-on, anywhere communication capabilities to users who are within range of a WLAN node.

- Inter-organizational links (i.e. between the shipping department of a supplier and the buyer’s purchasing department) in the form of electronic Just-In-Time (e-JIT) or Electronic Data Interchange (EDI) can be thought of as shifting the boundary of the entrepreneurial organization out to include elements of other organizations, thus creating a “virtual” organization. These kinds of networks are constantly replacing either Internal Wide Area Networks (I-WANs, i.e. corporate information networks) or External Wide Area Networks (E-WANs, i.e. public or private telephone networks) providing both voice and data transmission capabilities. A number of WAN technologies, that are totally digital and deal with message switching, are recently replacing the traditional telephone system. It was first ISDN (Integrated Services Networks), then ADSL (Asymmetric Digital Subscriber Line), frame relays and ATM (Asynchronous Transfer Mode), with cable modems coming up fast in some areas.

- Finally, the electronic market is the most highly developed form of electronic integration. While the use of Internet technology for conducting business between entrepreneurial organizations has started only since the mid-1990s, the concept has been around since the early 1980s. Nilles (1998, p. 79) claims that “The Internet, a well-kept secret among the military and academic communities for two decades, exploded into public consciousness in 1993… “. Internet has allowed major expansion of the business horizons of small- to medium-sized businesses, entrepreneurial or
not, that could not afford extensive private telecommunications networks.

The above four forms of electronic integration have, to varying degrees, the net effect of removing buffers and leveraging expertise both within and across the innovative entrepreneurial organization. It should be noted though, that an organization must have the necessary infrastructure of communications software as well as educated and empowered users before any of these forms of integration can be fully exploited.

**Educating Innovative Entrepreneurs**

The noted close link between entrepreneurs and innovation, which, in its turn is connected to information and communication technologies, is raising the question: Is the world educational system –secondary, higher, vocational and organisational– doing enough to create the entrepreneurs of the 21st century? Even at Schumpeter’s times it was recognised that while technological innovation was in the long run the most important function of the entrepreneur, organisational innovation in governance, finance, and management was comparable in significance. Thus, an innovative entrepreneur may need to synthesise technical knowledge on an invention with knowledge on customer needs and on the availability of suitable raw materials.

Technological knowledge describes the functions and interactions of natural and artificial things and may be either collective, in the organisation, or possessed by individuals. From this perspective, acquiring technological knowledge is valuable to the entrepreneur because it leads to further innovation. It may also be seen as the process by which an entrepreneurial, innovation-driven company develops and improves the skills of its employees. The so acquired technological knowledge may be both tacit and collective, and for this reason, difficult for other organisations to understand and imitate. Thus, it allows the entrepreneurial company to exploit a sustainable competitive advantage.

A good education combined with wide ranging practical experience helps the entrepreneur to interpret varied kinds of information and knowledge. Developing young students –engineers, economists, etc–
by adding new courses to both their graduate and Master level curricula, is a significant step towards this direction. Based on the issues discussed in detail in the previous sections (the economics of innovative entrepreneurship, the critical environmental and sociological factors and, finally, the support that ICTs offer to innovative entrepreneurship) we are proposing modifications for two existing graduate courses and four new, graduate and Master level courses to be added in the Greek TEI’s curricula of the 21st century:

A. Courses on Fundamentals of Economics and Fundamentals of Management already exist in the graduate curricula at a variety of TEI faculties (Engineering, Economics, Management, etc). Our proposal is to enhance them as follows:

- In the Fundamentals of Economics a chapter on the economics of entrepreneurship should be added and the chapters on financial planning and budgeting should be modified accordingly in order to cover issues related with the economics of entrepreneurship.
- In the Fundamentals of Management the chapters on programming, planning, and leadership should be modified and new chapters on innovation management, human resource management and risk management –issues that are of great interest to the young entrepreneurs– should be added.

B. Courses on Information and Communication Technologies are only offered in the graduate curricula of certain Engineering Faculty departments. Our proposal is for such courses –of course with a varied depth, according to the school and department– to be added in both the graduate and Master level curricula of a wider number of departments where students have a chance to follow an entrepreneur’s carrier.

- Information and Communication Technologies I (graduate level). Here, we propose the emphasis to be given on conversion, storage and processing of data with the use of modern software packages.
- Information and Communication Technologies II (Master level). This advanced module should emphasize on the effective use of advanced communication capacities (i.e. e-conferencing, groupware, etc.), networking (i.e. LANs, WLANs), and certain software applications (i.e. e-JIT, EDI, etc.) supporting inter organisational cooperation.
C. Courses on Innovation Management are not regularly offered at Greek TEIs, while there is a proposal for such a course to be taught in a Master level course under approval, at the TEI of Crete. Due to the importance of the subject, as highlighted in this paper, we are proposing the following courses to be included in both the graduate and Master level curricula.

- **Innovation & Innovation Management (graduate level).** Here the emphasis should be given on the Innovation Process (stages, the classical innovation model, classification and the Laws of Innovation) and the Management of Innovation (innovation as a business process, the innovation supply chain, innovation strategy and the role of the Innovation Manager).

- **Innovation & Intellectual Property Management (Master level).** This advanced module should emphasize on Innovation and Entrepreneurship (implementing and monetising the innovation options, timing and infrastructures), the Value and Sustainability of Innovation (assessing the value of an option, a portfolio of options and finally of innovation; innovation, intellectual capital and intellectual property; sustainable innovation model, criteria for sustainable innovation, assessing sustainable innovation); Patents and Industrial designs.

D. Specialized courses on entrepreneurship should be included in both graduate and Master level curricula.

- **Entrepreneurship I (graduate level).** Here, the emphasis should be on the analysis of the entrepreneurial process, entry strategies, opportunity recognition and marketing.

- **Entrepreneurship II (Master level).** In addition, issues like financial projections, dept, legal and tax, as well as the search of venture capital, financing and franchising should be addressed, at an advanced level.

E. Finally, as sociological and personal factors are important to the entrepreneurs, we propose for the following optional course to be included in either the graduate or Master level curricula.

- **Fundamentals of Social and Industrial Psychology.** The course should provide basic knowledge of personal attributes, sociological and environmental concerns, as applied to the field of commercial and industrial psychology.
Entrepreneurs trained on the above issues, at various stages of their educational pathway, shall have much better chances to manage innovative technologies. This has always been synonymous to success; especially in our days, when the globalisation symptoms that first appeared when the US multinationals burst into the scene, have now been extended to entrepreneurs from China and India. This new situation obliges entrepreneurs in developing economies, who now have to compete in a harder environment, to react. We believe that the above proposed changes in the educational modules shall strengthen their reactive position and will allow them to counterplot in a more effective way.

**Conclusions**

In this paper we have assessed a retrospective analysis of the entrepreneurial phenomenon of the eighties and we have looked into its economics and the critical factors that are essential for a would-be innovative entrepreneur. We have particularly focused on the impact of ICTs on entrepreneurship and have examined a number of positive ways in which ICTs assist an entrepreneurial company to accomplish its goals. We have demonstrated that innovativeness and entrepreneurship do not come accidentally, they are talents and ‘sciences’ that can be taught. This does not contradict Coulson-Thomas’ point of view that “some knowledge entrepreneurs are instinctive or born; others possess specialist expertise, or know about particular technologies”. After all, it is the same author who states that “in fields or sectors in which know-how accounts for an increasing proportion of the value being generated ... corporate culture, policies, processes and practices should all be supportive of knowledge entrepreneurship” (2004, p. 2).

We have also emphasized on the issue of education and training and we have demonstrated that there is a lot for an innovative entrepreneur to learn in order to convert his/her entrepreneurial small business into a successful organization. For this very same reason, we have proposed graduate courses to be enhanced and new Master level courses to be introduced in the revised curricula of the Greek TEIs. We believe that this is a safe way for new, entrepreneurial, economical, managerial, socio-psychological and ICT-based
competences to be acquired by the would-be innovative entrepreneur on time; that means before the moment she/he is required to demonstrate them in practice.

Under this perspective the innovative entrepreneur of the 21st century, who in the early eighties was identified as the individual who creates a new small business that flourishes, may now be seen as the engine of a nation’s economic and social growth. Entrepreneurial organisations are now acknowledged as the mechanism by which innovative products and services enter the market and create growth, in a way that allows economists to state that the more entrepreneurship an economy produces, the better are its chances of remaining competitive in today’s knowledge economy. Especially in the global arena of a borderless world of finance and innovative ICTs that grants to small businesses access to everything that in the past only big businesses could own.

Within the MOTIVATE (2007-2009) project, the consortium has developed three Master level modules that add increased technological innovation in Vocational Teacher Education: Advanced Pedagogy, Multimedia and E-learning, and Teaching a Specialist Subject. With all the above points raised in this case study in mind, the Greek and Portuguese partners have investigated the possibility of further developments to the teacher education curriculum, by the addition of an innovative entrepreneurship module to the common modules.

References


136

COMMON MODULE DELIVERIES

Case study on Teaching Specialist Subjects
(Agnes Toth)

Introduction

It was a well based decision of the MOTIVATE project consortium to carry out the third common module delivery using the native language of the participating vocational teacher training institutions. This resulted in a higher rate of activity in all institutions, because the lack of English language skills did not hinder the students’ communication.

Tutors and students of two Hungarian Polytechnics, namely Budapest Tech and Dunaújvaros College participated in the delivery of Teaching Specialist Subjects. Most of the students of master level courses have already been employed as teachers without the required Master level teacher of engineering qualification.

The aim of the students’ co-operation was to share their methodological experiences and pass on ideas and solutions to everyday teaching problems related to the specialist area of the subject matter.

The students were also encouraged to raise questions and initiate discussions.

The framework of co-operation

The activity was started within the consortium in October 2008 so that the tutors could have some preliminary practice in using the Moodle virtual learning environment for common module deliveries.

In parallel to this module another Moodle course on Multimedia and e-learning was being run in English, maintained by our Finnish partner institution. As a result of this coincidence, and the continuous
staff development courses, the staff of the vocational teacher training institutions became well trained tutors by the spring term.

From the beginning of February to the end of May a second group of students were enrolled to the course of Teaching Specialist Subjects. Although the first group graduated in December, later on they also joined in the new discussions when the topics proved to be of interest to them.

Geographically the participants were mostly Budapest and Dunaujvaros dwellers but about the third of the students lived in various parts of Hungary. Since the students were enrolled to correspondence courses it was natural that a mixed type of distance education was realised. It was a kind of blended learning in which the classroom coursework was combined with on-line studies and contributions.

The range of participants included 8 tutors and 72 students (four groups: two groups in Budapest and two groups in Dunaujvaros). The age range of students was between 26-54 years. Among the students 14 persons were female. The tutors’ ages ranged from 27 to 64 years.

The scope of attached materials by lecturers included tutorials, ppt (Powerpoint) presentations, pdf (Adobe Acrobat) files and website addresses. Students attached links to websites, links to videos, website addresses and word documents of their planned assignments for their pupils.

The number of forums in the mechanical engineering group was 20. The liveliest discussion concerned the development of spatial abilities. It brought about 18 comments.

In the electrical engineering group the number of forums was 19. The most vivid discussion consisted of 9 responses to the question: “Is it necessary for the schools to buy active whiteboards for so much money?”

In the IT engineering group the number of forums was 14. The most stimulating topic for discussion arose from the question: “What does the ideal IT lab look like?”, which invited 15 responses.

The number of questions in the mechanical engineering forums was altogether 32, in the electrical engineering group 22, and in the IT engineering group 30.
Qualitative evaluation of interactions

It might be interesting to investigate four students’ character and behaviour in the mechanical engineering group. Their interactions with others were notable.

The first one B. Sz. was a typical example of a lazy, “know-all” type of student.

In response to the request to post a question to the forum, he made the following statement: “As a teacher I would like to show the various types of springs for the pupils, but there is nothing on the Internet.” His tutor sent an attachment immediately with plenty of excellent illustrations from the Internet.

He responded that the illustrations were very good, but in fact he would rather want to know how to explain the shape of the spring layers.

At this point his tutor sent further material from the Internet along with some initiatives for the other students, to support discovery learning in this interesting area. She also asked some methodological questions, aimed at all the students, with the purpose of spurring the inactive student into action as well.

The strategy has been successful, because B. Sz., seeing the efforts of the group became more and more active step by step, directed three discussion threads in the end.

The second student, K. P., was full of inhibitions regarding ICT methods. She has been a teacher for more than twenty years and her original studies did not include computer techniques. At the start of the course she could barely use the keyboard and the mouse.

When the problem was broached her tutor offered some time for individual practice. K. P. needed a very patient approach but gradually she lost her shyness and believed she could do everything that was needed in the course.

She became most active when someone in the group raised the topic of project work. She wanted to share with others her positive
experiences using this method. Although she was a bit anxious at first about using the Moodle she has overcome her ICT inhibitions and joined in the discussion, telling in detail how the project work went on in her class when they worked on the topic of “water”.

The third student Zs. T. was young and lacked teaching experience, but he possessed an enormous quantity of curiosity. He had excellent ICT skills and experiences.

He decided to encourage the older students in his peer group to use all the applications which were available. In his messages he used several links either pointing to websites or videos or any interesting illustration and explanation which might be useful to them. This impressed the other students and the first thing they wanted to learn was how they could also build links into their comments. The explanation was demonstrated in a traditional classroom environment which proved to be effective for trying out the technique.

Zs. T. was enthusiastic about the opportunities which were offered by the internet. He suggested some ideas for the older students, through the discussion board of Moodle, to initiate actions with their pupils. He found that some teachers were reluctant to encourage their pupils because the pupils were shy when it came to using the internet for learning purposes, fearing their classmates’ mocking reactions.

Nevertheless, Zs. T. did not give up his “mission”. He decided to raise his peers’ interest towards the interactive white boards. In a long contribution on the forum of teaching specialist subjects he explained in details how the whiteboard works, what its functions are, what it is made of and how one can make his/her own whiteboard from parts (which were described and explained in detail) obtainable at a very cheap price.

He acted like “a Don Quixote”, not bothering about whether his ideas were heard and accepted or not. However, he was respected and liked by the group. The experienced teachers (his peer students) were very understanding and tolerant of the many beginners’ mistakes when he carried out his first micro-teaching in front of the group.
The fourth student Sz. P. was a young, determined woman, who, despite having broken her arm in a traffic accident, continued her teaching job in spite of the fact that her arm was in plaster and she could hardly use her right hand. Moreover her subject area was engineering drawing and machine parts. She discovered the best way of dealing with her pupils in these circumstances, and the pupils were most helpful. She invented several temporary methods because she did not want her pupils inconvenienced.

It was not only in her job where she was so pro-active. Although Moodle was a new experience for her, as for many others in the group, she was the most active in starting new topics, asking questions from the others and offering web addresses where teaching aids were available. The peak of her activity was at noontime on Sundays. Probably, she was the type of person who could utilise the time gaps of cooking technologies when preparing lunch for her family (with one hand!).

**Community atmosphere**

Getting so familiar with four personalities in my group it might be apparent that the group was colourful and the atmosphere was very pleasant.

Some students were less experienced in using ICT in their teaching work and this frustrated them at the beginning of the course. They were afraid of communicating on-line but with the support of their peers and tutors they slowly lost their fears. It was fortunate that there were some enthusiastic students who offered their knowledge, time and help to those in the group who needed this encouragement and assistance.

The extension of the students’ enthusiasm and activity is shown by the number and the length of comments. There were two students (Sz. P. and B. Sz.) who made eleven comments, although only five comments were obligatory. Some other students also exceeded the required number, but to a smaller extent.
The longest contribution consisted of 924 words, written by Zs. T. There were some long reflections as well. Many of the students sent attachments either to illustrate their ideas or asking questions about their methods.

The group followed with close attention their fellow students’ initiatives.

**Students’ exercises/assignments**

As regards the Moodle supports and services, there were reading materials available among the resources, and there were topics to be discussed, based on the posted methodological questions.

The students’ exercises/assignments included the following items:

- Participation in classroom discussions
- Participation in the Moodle forum discussions (with a minimum of five contributions)
- Presentation of a microteaching
- Preparation of two assignments by choosing two optional tasks from the given list (e.g. planning illustrations by displaying the applied methodological aspects or devising tasks for pupils to reach a deeper understanding of technical figures).

**Summing-up**

Together with other vocational teacher training institutions we introduced three common modules of master level courses. All the three modules were supported by Moodle.

The module of Multimedia and e-learning was organised by the Finnish partner institution. The module of Pedagogy was organised by the Portuguese partner institution. These two common module deliveries were provided in English.
The students were very much enthusiastic and satisfied with the opportunity to learn and work together with students of other countries. Their different attitudes enriched the teaching methods applied.

The third module: Teaching specialist subjects was delivered in the native language of the partner institutions. The adult learners proved to be interested in the new possibilities and perspectives provided by the Moodle virtual learning environment.
Conclusions about E-pedagogy in the Common Module Delivery
(Elayed Hassan)

Introduction

When the common modules were decided in the project processes “Pedagogy” and “Multimedia and e-learning” were important areas where many common elements of both theory and practice existed in the co-operating institutions. Furthermore, there is overlap between the two areas, in the sense that pedagogy is influenced by technological development.

This short review examines some of the contributions to the discussion forums, which were related to technology, set up in the Pedagogy common module. It is intended to demonstrate the degree to which the participating vocational teacher training students were able to add their knowledge and assumptions to the content of their own training.

Forums of the Pedagogy module

Within the Pedagogy module four forums, which had connections with ICT or multimedia, were opened:

- Elements of good teaching (11)
- Support for E-pedagogy (4)
- Creative teaching solutions (1)
- Action planning (3)

The number written in brackets after each forum title represents the number of discussions initiated in the particular forum. Certain discussions in the forum of “Support for E-pedagogy” are particularly interesting in the way that the gaining of knowledge in the field is promoted by the participants’ contributions. Two of these discussions warrant detailed examination:
Pedagogy and E-pedagogy

This discussion was started under the main topic by the UK tutor from the University of Huddersfield.

To better understand the term "E-pedagogy", it may be useful to consider if there are significant differences between this and just "pedagogy". Is it possible to use all teaching methods in an electronic form? Conversely, are there elements of E-pedagogy which do not transfer to a classroom environment?

Interestingly, a Hungarian student answered the question first:

The classroom environment consist of different elements, yourself as teacher, your voice, tone, volume (or thrilling silence), facial expressions, your expectations, your emotions, their emotions, their given momentary mood, time of the day, day of the week.

Monday, first class at 8 am is never the same than Friday the last class at for example 3pm. (Of course both are very unpleasant, but in a different way.)

So it' a different kind of story, unlike e-learning's timeless emotionless experience where you have to have your own motivation to start studying, in your own time. And there is no teacher in your back to kick you when it is needed.

Sometimes it's just the matter of taste or learning material. For example I can not learn programming from another human being, (especially not in a classroom, where other students might be faster than I am and then I start feeling like a loser all the time) but I am happy to learn it from books doing examples and on/offline tutorials in my own pace.

At this point the Portuguese tutor joined into the discussion:

I agree with Norbert.

E-learning is a good alternative for learning but it is not enough. In one course of e-learning that I participated, we feel that was necessary some face to face meetings/lessons for the success of the on
going work, specially as starting point for “breaking the ice” among participants and for decision making and solving problems.

A student from the UK succinctly summarised the advantages and disadvantages of e-learning and distance learning:

*I have found that e-learning is a beneficial feature to every class because it includes students who possibly cannot attend on certain days due to responsibilities such as children.*

*E-learning is also essential for disabled students who require print outs of notes before the lecture and possibly print outs on different coloured paper.*

*Some lecturers use e-learning pages well and include all lecture notes, resources and sometimes audio files when they have recorded a lecture.*

*This method of teaching requires tutors /lecturers to be creative and can also be a great time saver in the long run, because students can access the page(s) at any time to find the answers to any questions that they may have. This saves them e-mailing their tutor and possibly feeling foolish doing so.*

*E-learning has many drawbacks due to lack of class interaction and the ability to ask questions. However, it is an extremely useful tool which should be part of every course.*

An alternative point of view was provided by another UK student in the next contribution:

*No, because the presencial factor may count very much to the learning of some students. As a teacher, I value the most diverse teaching practices, and I believe in e-learning, but I don’t consider it by itself sufficient to the realization of a course.*

Then a Portuguese student joined in:
One of the main e-learning potentialities is flexibility and possibility to access to the learning resources, in any time and any place. For the efficiency of learning the strategies must be adequate for promoting that learning.

However, I think that complementary presence communication between a student and the tutor and among students is the key for an e-learning course success. We don't learn only by writing. All our senses are involved in our learning experiences. Maybe for this reason it is difficult to teach all the students using this methodology.

Recognising the importance of the communication between students and the teacher, the Hungarian tutor reflected on the remarks.

I am very glad that you emphasized this: "I think that complementary presence communication between a student and the tutor and among students is the key for an e-learning course success."

Just recently a demonstration of using digital white board almost made me crying. The teacher performed an excellent "show" proving his expertise both professional and ICT. The students' only activity was pressing the buttons of their feed-back device.

When and how will they practice communication, problem solving and team work? I think E-learning and other ICT methods should be characterized as complementary tools.

A UK student responded:

I agree. The main element of all learning is the relationship of the tutor and student. However, I believe that industry and real World practise must be incorporated as much as possible.

The conclusions were drawn by a Portuguese student.

E-learning has several potentialities. It is flexible according the students' needs, but simultaneously it requires high degree of autonomy and discipline.
E-learning needs to be complemented by face-to-face sessions because learning process demands student-teacher and student-student interaction.

Through the course of this discussion an accumulation of understanding on the perceived benefits of, and problems with, e-learning is evident. There are possibilities for a refinement in the knowledge base in this theoretical topic through participation.

The second discussion to be examined shows how learning materials in a practical subject can be developed through discussion and collaboration in team work:

**Creating an E-learning material for elements of this course**

This discussion was started by a Hungarian student:

*The plan is to do it collaboratively, sharing the partial results, and helping each other with it, and learn something on the way.*

This student, encouraging group or team work here, was a key contributor to the forums. (The same student also explained the importance of using e-learning materials in the discussion previously examined.)

*The main goal is to create a SCORM compatible module which we can embed in Moodle, but first a normal xhtml version is needed. If someone was so kind to help with this, it would be absolutely great.*

Step-by-step two teams of Hungarian correspondence course students were formed. Ideas were pooled, and materials collected, in order to build e-learning products. One group produced an html e-learning material, and the other a Power Point presentation.

The products were presented as joint submissions for the first assignment of the term. Following negotiations with the Hungarian tutor on the achievement of learning outcomes, it was confirmed that individual contributions to the group work appropriately met the assessment requirements.
This team work was accessed several times during the term by the tutor and the peers of the students, and the products were further developed and refined. Thus the results were not only acceptable for assessment purposes, but also provided a good learning resource for all participants of this course and for participants of similar courses in the future.

In these two examples from the Pedagogy common delivery module forum, it can be seen that students, as well as tutors, can add to the knowledge base in both theoretical and practical topics through participation in the discussions and ensuing collaborative activity.
The Student Perspective on the MOTIVATE Common Modules
(Gabor Klucsik)

This paper aims to discover student opinion of the common modules developed during the Motivate project, by presenting detailed analysis and discussion of the contributions to the forums set up for one of those modules, the Advanced Pedagogy module.

The pedagogy module in the Motivate project had a structured e-learning resource, extended by the possibility of interaction with other users using the forums. It consists of four sections: pedagogical practice, creativity and innovatory practice, problem solving and action planning, and models of reflection and evaluation. Every section has different kinds of materials: documents, presentations, tests and forums. A forum has one main topic, although the students and the teachers are able to create subtopics, so it can become a structured knowledge-base. If somebody writes his or her opinion into the forum, the other students and teachers are able to answer the question or they can write their opinion. The system provides the possibility to follow these replies, so it is easy to read all opinion about the discourse.

The first section has several documents about the goals of teaching and the intercultural differences of students. The section has two forums: Elements of Good Teaching and to respect other cultures is an ethical demand. Both promoted many discussions.

The second section has different materials: documents, presentations and two forums: Support for E-Pedagogy innovations, and “Creative” teaching solutions. These two topics were not as popular as the forum of the first section, but there were nevertheless many interesting opinions expressed.

The third section has a presentation and a forum about the topic: Problem Solving and Action Planning. There were only a few user activities in this forum.

The fourth section has two questionnaires about the e-learning materials and the experience of using this virtual environment. It proved a good way to receive feedback.
**Pedagogy Module - Section 1**

This section provides knowledge about the following topics:

- Analysis of pedagogical practice
- Review of teaching experience to date. Feedback from observations
- Advanced teaching techniques (what makes a good teacher, questioning techniques, behaviour management, etc)
- Observation of other teachers (ethical issues, good practice) – video case studies
- Review of how people learn – learning/teaching theories and practice
- Review of lesson planning, teaching/learning methods, resource design

It has two forums with the following topics and subtopics:

- **Elements of Good Teaching**
  - Importance of other factors (8) *
  - What is the maximum amount of students in classroom? (2)
  - E-learning as useful educational tool (5) *
  - How to approach the dilemma of teacher’s own inadequacy? (2)
  - Elements of Good Teaching (39) *
  - Hungarian mathematics teaching (1)
  - Cheating (10) *
  - How does the evaluation methods support learning? (1)
  - Good communication (3)
  - Learning by way of research and development projects for companies (2)
  - Technical gadgets (2) *

- **To respect other cultures is an ethical demand**
  - How to organise group work in a culturally mixed class? (14) *
  - Is it important to be cultured?? (22) *

153
Education has influence on the attitude or does it? (1)

How to define culture differences? (1)

The numbers in brackets indicate the number of replies, and the discussion topics marked with an asterisk (*) were started by Hungarian students/teachers.

**Elements of Good Teaching:**

*Importance of other factors:*

There were eight conversations about what factors are important to get success in teaching. The opinion of the student is the following: the classrooms need to be nice, well organised, and pleasant (some teachers bring carpets, flowers, paintings for the room). It is important also to use the projector and the interactive table, because you need to demonstrate the topic. If possible, it is good to give some physical demonstration material too to the students.

In my opinion this forum was useful, because the participants got to know what think other cultures about this topic; they realized, that it is not enough to have a well-equipped classroom, there are other important factors too.

*What is the maximum amount of students in classroom?*

There were two conversations about the ideal number of students in a classroom. The opinion of these three students is the following: if the lesson needs two-way communication the ideal number is 20 students. If it is a mass lecture the number of students should not be greater than 200. In this case the learning is the student’s responsibility, they ask the teacher after the class, they do not interrupt the lesson.

*E-learning as useful educational tool*

There were five conversations about e-learning strategies. The opinion of the students is the following: e-learning systems help the work of the teacher and the students too. However in many cases the teacher might upload only PDF, Word documents and presentations. The students use the materials at weekend too, because they can have access to these materials anytime, anywhere, but if the e-learning material is well planned it motivates the students better.

Most of the students were Hungarian. The participants realized the power of an E-Learning system: it can motivate. They realized that
also it is not enough to just upload some files; E-Learning is more than that.

_How to approach the dilemma of teacher’s own inadequacy?_

There were only two conversations about the teacher’s own inadequacy. The opinion of the students is the following: they are doing their best when they are teaching, but it feels like it is not enough. If they try to get the maximum out of themselves they can expect more from the students too, but it is not good in any case. They do not have enough time to give accurate notes for the exams and it is boring to correct them.

In this forum the participants realized that the life long learning is important, but if they learn more and more, teachers need to be careful not to expect too much from the students. In the next topic they chatted about the importance of a high level of expectation from students, but it is really difficult to find an appropriate level of expectations.

.Elements of Good Teaching

There were 39 contributions, so this was the most popular topic, about the elements of good teaching. The opinion of the students is the following: the teacher needs to like their subject and he or she must have enough knowledge about the subject to teach it; these are the most important things. The teacher can motivate the students with interaction and if the students can imagine a real-life situation. A good teacher has a good relationship with students (they like to be friends), but there is respect also. If the teacher is too friendly, he or she will not get respect. It is important also to communicate high expectations to students, but the students need to feel that they can meet these expectations with hard work. The teacher needs to collect feedback also, so he or she can change if something is not going well.

This forum was undoubtedly useful as it was the most popular forum. The participants realized the most important teaching problems and they have a good opinion about how to make good these situations.

_Hungarian mathematics teaching_

There was only one contribution about Hungarian mathematics teaching. The one student commented: productive learning requires advanced level of algorithmic thinking using relevant analogies.
Problem solving and problem building should be taught in this second phase. Building further examples individually to illustrate the theory concerned can efficiently help to develop creativity.

**Cheating**
There were 10 contributions about cheating. The opinion of the students is the following: cheating is typical in secondary school, not at university. In the Finnish university there is a rule, that if you are caught in cheating in an exam, it is impossible for you to ever accomplish that course. One possibility discussed is that the questions are simple and step-by-step, they are requiring detailed information, or the other possibility is that the questions are complex and students are able to use books and notes.

I thought that this forum was useful, as the participants realized the differences between nations. I hope that it will have an effect on Hungarian teaching methods.

**How does the evaluation methods support learning?**
There was only one contribution about evaluation. The one student commented that: the written exam is not the best choice. It is better if the students evaluate each other or engage in reflection. It is important to declare before the course starts what are the main issues in the subject and focus on those in the evaluation process.

In my opinion this topic is interesting and important; student self-evaluation peer-evaluation are really good methods to employ. I use these evaluation methods and sometimes the students give strong feedback on each other. However, I think it is important to give anonymous feedback in this situation.

**Good communication**
There were only three conversations about good communication. The opinion of the students is the following: it is really hard to activate the students, they usually write only remarks about what the teacher said. If asked for their own opinion, usually none of the students will answer. One possibility is to wait until eventually somebody answers, or directly ask one student. The teacher needs to say that a wrong answer is also valuable.

The Hungarian participant realized that good communication is a problem in Finland too. The participants realized the problem, and they gave several solutions. I think you should use the method which can best activate the students.
Learning by way of research and development projects for companies

There were only two conversations about researches. The opinion of the students is the following: it is really hard to manage students to participate in real-life projects. The main reasons are that these projects have strict timetables, and if it is important the company cannot afford it to be made by students.

In my opinion this forum was useful, but only Finnish students used it. The participants told about a real problem. At my school the students, who are learning communication, in the last two semesters, practice in local media and in the school too. I think it helps the students to get know the expectations from a real job and they really like it, because they can learn in a real environment from a well-known person.

Technical gadgets

There were only two contributions to this topic. The opinion of the students is the following: everybody uses demonstration materials, projector, computer and sometime interactive tablets. The participants told what kind of devices they are using and they received the feedback that in Finland they use the same equipment.

To respect other cultures is an ethical demand:

How to organise group work in a culturally mixed class?

There were 14 conversations on this topic. The opinion of the students is the following: a culturally mixed class is rewarding as well, as each student approaches the subject from a different point of view and using different methods. Creating sub-groups in a mixed culture group does require a certain amount of negotiation from the group leader, and some forward planning. It is part of the teacher's job to introduce the students to people from other cultures.

In my opinion this forum was useful, in that, through discussion between the different nations, the participants told about real problems, and I think they learned a lot of each other.

Is it important to be cultured?

There were 22 conversations about how important is to be cultured. The opinion of the students is that it is important to know about other cultures to understand their behaviours. In the primary and secondary school the students learn only about borders and many data
that they will forget, because they do not use it. Another problem is that if other cultures are coming into a city, e.g. in Budapest you are able to buy the same clothes as in Berlin, London or Madrid, it is sometimes hard to find a place which promotes the native culture.

_Education has influence on the attitude or does it?_

There were only two conversations about attitude. The opinion of the students is the following: in real life if a foreign student has a positive attitude and open mind, all cultural differences are accepted, creating a culturally-enriched environment. In the school world the situation is perhaps different. There are pupils from different countries and from totally different cultures. Children may have traumas or social problems in their families, too. A teacher can't demand from a child the same efforts as an adult student. The teacher has to help children to understand each other and to cooperate. That means the teacher has to study and understand the cultural differences to be able to teach in a multicultural class..

_How to define culture differences?_

There were only two conversations about how to define culture differences. One of the students, Gert Hofstede, has a very interesting definition about different cultural elements that brings people together or distinct people from each other. These elements are about power, individuality vs. communality, masculine vs. feminine and tolerance of uncertainty. Cultures are in different dimensions of these elements and that has a great impact on individual behaviour. Culture is in a way very dangerous, if an individual expects certain behaviour from the other person, and he gets some completely different reaction.

In my opinion this forum is interesting and important. The Finnish and the Hungarian students shared their opinions with each other.

**Pedagogy Module - Section 2**

This section provides knowledge about the following topics:

- Creativity and innovatory practice
- What is creativity?
- Innovation and creativity in the practice of teaching
- Modelling creativity
- Problem solving - innovative solutions
• Technological Innovation - E-pedagogy
• Methods of initiating change - overcoming resistance to change

It has two forums with the following topics and subtopics:
• Support for E-pedagogy innovations
  o Pedagogy and E-pedagogy (8)
  o Creating an E-learning material for elements of this course (5) *
• “Creative” teaching solutions
  o Creative solutions (7)

The numbers in brackets indicate the number of replies, and the discussion topics marked with an asterisk (*) were started by Hungarian students/teachers.

Support for E-pedagogy innovations

Pedagogy and E-pedagogy
There were 8 conversations about whether it is possible to use all teaching methods in an electronic form. The opinion of the students is the following: E-learning is a good alternative for learning but it is not by itself enough. E-Learning requires tutors / lecturers to be creative and can also be a great time saver in the long run, because students can access the materials at any time. This saves them e-mailing their tutor and possibly feeling foolish doing so.

Creating an E-learning material for elements of this course
There were 5 conversations about creating E-Learning materials. The opinion of the students is the following: they would like to create SCORM compatible materials. An E-Learning material requires pictures and it is really hard to find any good, free to use pictures. It takes time to get the right to use the picture, so they suggest creating the community free to use pictures.

“Creative” teaching solutions

Creative solutions
There were 7 conversations about creative solutions. The opinion of the students is the following: even, if we use all the current technologies the learning is not significant if the teacher is not a good
communicator based on a good specific content knowledge. Every course needs a different teaching strategy to motivate the students.

**Pedagogy Module - Section 3**

This section provides knowledge about the following topics:

- Problem Solving and Action Planning
- Overview of research methods in education
- The nature and methodology of an action planning process
- Addressing issues of ethics, validity and reliability in problem solving processes
- The implementation and reporting of problem solving and action planning processes

It has one forum with the following topics and subtopics:

- Action planning
  - Problem Solving (2)
  - Action Planning (2)

The numbers in brackets indicate the number of replies.

**Action planning**

*Problem Solving*

There were only two conversations about problem solving. The opinion of the students is the following: it is necessary that the teacher addresses different processes on how to solve problems, developing the students’ creative and critical thinking. To solve problems is a way to think and it is the basis for our daily life and not only for acquiring academic knowledge.

*Action Planning*

There were only two conversations about action planning. The opinion of the students is that all activities in the classroom demand an action plan. The action plan, the defined goals and the evaluation of the results are interrelated. If the expected results are the same of the real results we can say that the action plan was achieved.
Student Opinion

I interviewed the students who particated in this project, in order to learn more about their experiences.

They mentioned that they find the Motivate Project very useful. At first when they read only the E-Learning materials they did not think that the forums would be so active and useful. They told me they valued the documents very much, and that they found the forums really useful; they learned a lot from other students, and were particularly glad to be able to communicate with students from other countries. They did, however, realize some inter-cultural differences.

They told me that the only problem was sometimes their language knowledge; they can translate the English to Hungarian, but they find it hard to translate Hungarian sentences into English. That is the reason why some students registered, but did not contribute to the forums (although they did read them). This language knowledge problem is widespread, and around half of the students did not receive their diploma, because they have not passed the language exam.

In summary, they used this E-Learning material often, they liked it, and they used it more often than they would have used a book, say. Subsequently, they thought about these topics more than if they did not have access to this E-Learning system.
QUALITY MANAGEMENT

QMS Analysis of the Pedagogy Forums
(Adam Balazs Toth – Anna Beres)

Introduction

The purpose of this paper is to give direct feedback about some underlined QMS (Quality Management System) elements used in MOTIVATE. The other purpose is to support the design of QMS of future projects by analysing the QMS elements of the current project in practice.

During the MOTIVATE project, the following QMS elements (sources of information) were used:

- Controls of QAPs (Quality Assurance Procedures)
- Internal forums
- Phase questionnaires and interviews
- Internal audit results
- External monitoring

Evaluation method selected to the practice of MOTIVATE: SWTD (Strength, Weakness, Threat, Demand)

This review concentrates on controls of QAPs and internal forums.

Controls of QAPs

The contract and the referenced regulations of the MOTIVATE project itself contained predefined QM (Quality Management) rules. Participating project institutions having their own quality management system had knowledge about the definitions, theories, methods used by a QMS. Based on this background there were less procedures which were redesigned directly to the specific need of the project.

Most of the procedures were standardised in the participating project institutions.

For experimental purposes we used some new electronic working controlling and communication platform in the MOTIVATE project. The new features of electronic field of action helped participating
members to react and take actions on project issues in a quicker and more flexible way. Due to the fact, that only experts of the field had interest and access, the weaknesses of the electronic platform were ineffective. PDCA (Plan-Do-Check-Act) theory was followed as a basic part of internal quality assurance, regarding common module development and implementation in the project.

**Internal forums**

Internal forums are indirect indicators of the project activity. Analysing the forum, activity could be monitored and if necessary moderators could navigate the forum to the initial subjects or create new topics. From the QM point of view both the activity in time and the gathering of content is important to be able to evaluate and compare different control elements.

Via traditional content development the process of development and the review or control is segregated in time. In Internal forums the role of authors and reviewers are not dedicated to already defined persons. Control activity is practiced by the entire community of the given forum.

Total number of participants in the common module delivery regarding the Advanced Pedagogy module was 81.

Participants per countries as at 20/07/2009:

<table>
<thead>
<tr>
<th>Country</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>9</td>
</tr>
<tr>
<td>UK</td>
<td>11</td>
</tr>
<tr>
<td>Hungary</td>
<td>52</td>
</tr>
<tr>
<td>Portugal</td>
<td>9</td>
</tr>
</tbody>
</table>

Forums were analysed from the content point of view. Out of the examined topics the most successful topic was selected to see how information is gathering in time and how the number of participants increases.
Forum topics/ discussions:

<table>
<thead>
<tr>
<th>Elements of Good Teaching</th>
<th>To respect other cultures is an ethical demand</th>
<th>Support for E-pedagogy innovations</th>
<th>&quot;Creative&quot; teaching solutions</th>
<th>Action planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

Eleven subtopics in “Elements of Good Teaching”:

1. Importance of other factors
2. Maximum amount of students in classroom?
3. E-learning as a useful educational tool
4. How to approach the dilemma of a teacher’s own inadequacy?
5. **Elements of Good Teaching**
6. Hungarian mathematics teaching
7. Cheating
8. How do the evaluation methods support learning?
9. Good communication
10. Learning by way of research and development projects for companies
11. Technical gadgets

The further analysis refers to the forum:

5. **Elements of Good Teaching**

“Do” elements :

- enjoy teaching,
- divide the work,
- be able to relate topics to real life events,
- use methods such as ‘learn by doing’,
- make funny and interactive lessons,
- motivate students,
- take student's imagination out of the room,
- listen to students,
- respond constructively,
✓ stimulate interest,
✓ use a variety of methods addressed to the needs of students,
✓ interact extensively inside and outside of the class,
✓ provide prompt feedback,
✓ show them examples in real life immediately after lessons learnt in the classroom and go back,
✓ give examples and problems from every day life situations,
✓ be ‘in tune’ with the students,
✓ adjust to student needs,
✓ demand a lot of work from students,
✓ monitor your students’ achievements as kinetic, aural or verbal achievers,
✓ be simple,
✓ know both theory and practice,
✓ deal with the student’s individual field of interest,
✓ show examples of a healthy life (eating, sport, balance, etc. How can a hungry student concentrate?)

“Not to do” elements:

  o use teaching strategies, that promote the disappearance of the natural curiosity of students
  o use tools and methods that ‘diminish’ the subject

Desirable teacher qualities:

  ✤ confident,
  ✤ enthusiastic,
  ✤ “love the subject”,
  ✤ creative,
  ✤ logical,
  ✤ flexible,
  ✤ honest,
  ✤ able to accept criticism,
believe the importance of your subject,
day to day researcher in own life,
different teacher character types can match student taste/needs,
good story-teller,
excellent communication skills,
have empathy with students

Methods, elements related:

- clearly stated policies and expectations,
- fair grading policy,
- well planned sessions,
- progressive enquiry,
- problem-centred learning,
- use of case-studies,
- use of tools and methods which do not diminish the subject,
- engage with professional networks,
- maintain the ‘spirit’ of a class by taking care of influential class ‘characters’

Questions opened:

Students ask themselves

- What's in it for me?
- Why do I need this information or skill?
- How will I benefit from it?
- How can I make use of it in a practical, real way?
- How will it help me be a better person or professional?

Teachers ask

- How can teachers create learning situations, where students can have answers to their motivational questions?
- Are students responsible for their learning or is that the teachers' problem?
- What is the relationship between evaluation and good learning?

Summary:
“Learners are motivated to learn when they have a need to know”

Conclusions

From the analysed answers it can be seen that the forum is a strong tool of electronic communication. In a very short time participants are able to add their personal knowledge from their own practice to a given topic.

More questions and answers were generated by those who had a controlled knowledge of the specific field. The forum activity resulted in a common development of knowledge in the related topics.

The selected topic had been ‘active’ for 3 months. The number of answers and the content of the activity had no real relationship with time, but it is clear that a successful prolonged discussion depends on the first few answers. Just a few members can greatly influence the course of the contributed information.

In most forums analysed, the raiser of the first question kept the role of moderator, although there were topics where the role of moderator was not visible. In these cases the control function was practiced by the entire community and “silent” readers.

In this project, where the members of forums were teacher/students of similar fields there was an automatic interest in the raised topics and there was no need to take extra actions to motivate them to take part in the forums.

There are several other methods of content development and control, where the effectiveness could also be measured. Examining the MOTIVATE project it can be stated that forums are strong tools both in content development and control activity.
Comparing the MOTIVATE Project Module Delivery with Other E-learning Experiences
(Peter Ludik)

Introduction

At the College of Dunaujvaros a complex virtual learning environment (VLE) was used, prior to the VLE used in common module delivery in the Motivate project, for engineer-teacher MA degree students, to help the teaching of education technology and methodology subjects. Given the experience gained from the previous Leonardo project, VELVITT, the Moodle VLE system was chosen for the development from the available environments. The students had a positive attitude to the introduction of the system, and they collaborated actively. In the Motivate project they engaged in other Moodle-based VLEs too.

In this case study I will analyze and compare the learning platforms for two of the common modules in Motivate and our methodological practice resource, exploring the similarities and differences between the three systems and environments. The comparison will take into account the teachers’ experiences, logs of the virtual systems, and evaluation questionnaires completed by the students.

Background

When Masters level courses were started at the College of Dunaujvaros the need arose for new, up-to-date study materials which fully satisfied the learning requirements. From developments in previous rounds of LEONARDO programmes, the most suitable source material was available for topics of teaching technologies and methodology. This led to a successful tender, introduced by APERTUS public endowment, for developing electronic tutorials.

The aim of the project was to build learning materials and connected training concepts which will enable practising teachers in specialist subject fields to be able to use existing digital materials effectively in teaching situations. The result would be the implementation of new
pedagogical methods of media based teaching. Beyond this the aim was to enable:

- participants to get to know electronic distance teaching methods, and their advantages and disadvantages, via a specific example
- designers of e-learning programmes for the College, and future users, to gain experience before scheduling,
- modification of the programme as a result of the experiences and observations of participants

By the use of web based frame system transmitting electronic tutorials a further aim was to motivate students for collaborative work and task solutions. Studies were assisted by tutors on each subject, whose duty was to:

- monitor students’ jobs,
- give students personal advice,
- motivate and generate communication within a subject (course)
- evaluate study results

This programme provided opportunities for developing the tutor-student relationship, as well as for sharing experiences and problems. In spite of the distances separating the two parties, all of this could be done directly and quickly by the help of the internet. On request, there was also the possibility of personal consultations.

Structure of the study material:

The material is built on 3 main topics:
1. Information technologies
2. E-learning methodology
3. Web communication

Regarding feedback and testing:

- A checklist can be found at the end of the content part – primarily for monitoring theoretical knowledge.
- Exercises at the end of the content part measure practical knowledge.
- An opportunity rises for self evaluation at the end of every main section – gives feedback to both students and teacher about the level of knowledge.
• Results and feedback are given for every task – if the answer was not known it will help to find it in the study material.

There were 1500 exercises made to test theoretical knowledge. These can be found at the end of modules and we used this questionnaire for evaluation, too. For the evaluation of practical abilities the students have 4 hand in exercises:

2. Evaluation of a Multimedia CD-Rom.
3. An interactive animation.
4. A tutorial movie (or at least its script).

The goal is that competencies gained here, will be used for any topics. The electronic material supports own acquisition of knowledge, ability and competence improvement. 700 pictures, 100 movies, and 200 animations will support study. A Moodle-based virtual study environment has been created, where students can find all theoretical materials, questions and hand in exercises.

**Activities in the MOTIVATE project**

Within the framework of the MOTIVATE programme corresponding virtual environments were started, with the same goals and themes, targeting masters level engineering students. The opportunity arises from this conformity, for the comparison of teaching experiences using these systems.

I obtained data from two sources: firstly, the logs relating experience of running the virtual systems; secondly, the questionnaires filled by students. The activity on forums of the students – the time spent with materials, participation (active and passive) time and frequency – was monitored. It is hoped that the questionnaires will give a subjective evaluation about the usability of the system, mainly from the aspect of the students.

The main aim of the project was to create the VLE system and set up e-Learning materials, contributed to by participants, in such a way that it can be implemented in any Higher Educational System.
Statistics from the MOTIVATE project:

For the purposes of this analysis, two courses in Motivate were scrutinized, the first of which, the Pedagogy course of Lisbon University, was held in English with international participants. There were approximately 80 active players, the materials were compiled by participants of the project, and there were forums about study materials and the fields of new communication technologies.

The other course was started by the Centre for Teacher Training and Engineering Education of Budapest Polytechnic, and provided a forum on methodology. This course was held in Hungarian, the main aim being to utilise new technology, and take advantage of the benefits of e-learning, without the barrier to participation of a non-native language. Firstly, students replied to each other on forums for virtual study environments, and then further forums were developed in specific specialist areas. There were 80 registrated participants, who were all active in the course, but the questionnaire was completed by 15 participants only.

General experiences

Overall, there was great interest shown by the students; they valued and exploited the opportunities of independent learning provided for them by the systems.

They became acquainted with a new teaching method, which they are ready to apply during their work as well. Perhaps it is the most important result of this work. A number of my students informed me that they can see the potential of the system, and they said they were unable to take part in the work more actively only because of a lack of time. They asked me to make the materials accessible for them after completion of the project as they wish to use them at a later date.

Unfortunately, on the Dunaujvaros course, we were unable to get the students to use the communication tools within the course. Interaction took place using other communications channels (personal discussions, mailing lists), but they did not exploit the tools offered by the system (Forum, Chat, Wikipedia). The other two courses initially put the emphasis on those facilities, and limited success in their use was achieved.
Analysing the log (diary) entries it became evident that the students spent little time on studying the learning materials of the courses. On many occasions they spent as little as 2-3 minutes (or even less) on one lesson. One of the reasons for this is maybe that the students were familiar with the given study material, so they gave it no more than a cursory glance. On the other hand, the time usage information obtained from the log must be handled cautiously, as the displayed data do not necessarily reflect the span of time students really spent on studying the course. It is hard to imagine that a student spent more than an hour studying a lesson containing only two ‘screens’ of information. It is highly likely that the student forgot to close the connection!

During the acquisition of the study material at the Dunaujvaros course a meaningful number of the students (two thirds) opted for printing the e-learning materials, they used the on-line system only for communication and the submission of assignments. E-learning appeared, in this case, to take a significantly lesser role in course completion. This was not apparent in the other two systems because in those systems there had been significantly less study materials loaded. The acquisition and application of the materials was not a priority, since the resource consisted more of thought provoking discussions and supplementary materials. In the Portuguese system, for instance, studies of different styles, contributed by participants from different countries, could be found connected to a given topic. On many occasions the aim was to spread knowledge about their own educational processes.

An important lesson to be learnt from all three systems is that during the acquisition of the study materials the students did not learn continuously (according to a regular schedule), but they engaged with the materials on an occasional basis, spending variable time periods at each visit. To change this practice the tutors need to emphasis continuous learning or the number of dropouts may be very high. It was my experience that the students’ activities increased after warnings from the tutor, and then the students proceeded to carry out the given assignments.

In the case of the Dunaujvaros system we expected that the distance learning students would use the on-line consultation opportunities but
the evidence does not support this. They did not monitor the open forums carefully enough, and missed important information (deadlines, assignment formats etc.) Among the services of the on-line system it was not the chat, forum and consultation which proved to be most popular, but the study materials, tests and their evaluations.

**Evaluation of findings from the questionnaires**

All students were asked to complete a questionnaire which had approximately the same contents and format for all of the three courses. Questionnaires were completed electronically in the MOODLE system, which provided simple data input and processing facilities. Students were asked to represent their own opinions and judgements, and not try to meet their teachers’ supposed expectations. The questionnaires required a minimum of 7-8 minutes for completion, in an attempt to ensure that the data providers did not “click randomly” but that they gave each answer serious consideration.

The first set of questions examined the users’ opinions about the implemented virtual educational environment. On a scale from 1 (total disagreement) to 5 (total agreement), in all three systems we received closely corresponding responses. Surprisingly, the following question contained the highest value: “In the e-learning environment of your school you are responsible for your own learning process.”

One of the interesting statistical results followed from the correlation analysis of the questionnaire. Evidently, there is a significant correlation between the teacher’s directing and stimulating role and productivity. Correlation was also high between the methods of scheduling learning materials and the pace of the learning process; the in-built organisation of education and management in the study materials was incomplete, and the tutor had to make up for this. In the future more emphasis needs to be placed on the curriculum development. and within this, more emphasis will have to be put on the methods of study material acquisition. If there are good study materials available the tutors’ responsibilities and directive roles will reduce and the students and self study activities will be central.

Analysing the differences between the responses to the questionnaires in the three courses the most significant differences related to the
evaluation of peer assistance and how much students help each other. It is not surprising that where the students of the College of Dunaujvaros form the one study group, cooperation among them is stronger than the cooperation among the students taking part in the “international” group.

The students from Dunaujvaros were allocated more tasks with deadlines, and so they were compelled to study on a more regular basis. They had weekly assignments which greatly limited the flexibility possible for timing their engagement with the materials.

Another difference can be linked to practical usability of the system, whereby the system applied at the College of Dunújváros is an organic component of the training so the students have to apply the knowledge acquired during their practical work too, whilst materials of the MOTIVATE project are experimental and not as well integrated into the training.

**Summary**

In summary, there was no significant difference between the responses given by the students participating in the different courses, and this can perhaps be attributable to the following remarks:

The virtual learning environment had already been introduced in the institutions participating in the project so the students needed no introduction to the system and its navigation.

This team conducted several joint researches and the learning materials, as well as the questionnaire, were formed during regular meetings and discussions.

Although the students of the course came from different backgrounds they took part in the project with the same goal. In the future it would be well worth comparing responses according to the participating institutions to which the students belong. This would highlight the current status of the educational systems regarding the use of virtual learning environments.