TeNeGEN

E-learning

Teachers challenged
by the Net Generation

TENEGEN
CONNECT THE TEACHERS – TO REACH AND TEACH THE NET GENERATION

THE ELEARNING TEXTBOOK FOR CLASSROOM TEACHERS

IF YOU HAVE ANY QUESTIONS REGARDING THIS BOOK OR THE PROJECT FROM WHICH IT ORIGINATED:
MARIA HARTYANYI
PROMPT-G EDUCATIONAL CENTRE FOR INFORMATICS
H-2100 GÖDÖLLŐ, TESTVÉRVÁROSOK ÚTJA 28.
TELEPHONE: +36/28/430695, E-MAIL: EDU@PROMPT.HU

PUBLISHED BY TENEGEN CONSORTIUM
WRITEN BY:
ISTVÁN DR. BESSENYEI - ISERG (SECTION 1, 2, 3, 4)
KEN CURRIE - CAPDM (SECTION 5)
RÓBERT FARKAS - PROMPT (SECTION 4)
GIOVANNI FULANTELLI - CNR (SECTION 7)
RIZA TAYFUN GEDIK - BUNI (E-LEARNING IN PARTNER COUNTRIES)
GÁBOR LAJTOS - PROMPT (SECTION 5)
MÁRIA HARTYÁNYI - PROMPT (SECTION 1, 2, 3 ,4)
ED MAHOOD - DEKRA (SECTION 8)
PIERFRANCO RAVOTTO - CNR (SECTION 7)
MARTIN SMITH - CAPDM, (SECTION 6)
SELIN YALINIZ- BUNI (SECTION 8)
COVER DESIGN, LAYOUT AND EDITING: ZSOLT LENGYEL, SZILVIA GERHÁT

PROJECT COORDINATOR: MÁRIA HARTYÁNYI
PROJECT WEBSITE: WWW.TENEGEN.EU

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INTRODUCTION

WELCOME TO TENEGEN!

The Tenegen Consortium dedicates this book to all teachers and trainers throughout Europe who are interested in adapting their pedagogical practices to meet the needs of the students born into the digital age. Ten years after a Hungarian researcher wrote this:

"I do not see much sense in trying to prepare children for using intelligent IT systems of the future by running software from the past on yesterday's computers, using pedagogical methods from the day-before-yesterday."(Komenczy, 1999)

We can still say that European schools have not been able to change fundamentally their educational practice till now, in spite of the improvements made into ICT infrastructure, e-learning developments, and teacher training, encouraging them to use ICT in their every day classroom work.

In the Tenegen project, we decided to transplant the newest teaching/learning theories into living pedagogical practice having been convinced that we have to "Connect the TEachers to reach and teach the Net GENeration" instead of delivering them "e-learning methods" using traditional methods.

We were convinced that in order to progress towards the desired direction, the methods of teacher training must be reconsidered. Training teachers to use software applications in traditional classrooms is not sufficient at all to develop advanced networking competences. This was the main challenge for the Tenegen project which we met. The traditional knowledge distribution methods for teachers were successfully embedded into the same networked learning environment that is a feature of every day life for the students.

How far did we get? What kinds of experiences were collected during the one year long online collaboration with teachers? What are the main conclusions?

The answers are to be found in this book.

Mária Hartyányi
Project coordinator

TeNeGEN

CONNECT THE TEACHERS TO REACH AND **TE**ACH THE **NE**T **GEN**ERATION (2008-2010)

Teaching methods are being continuously changed by our information society. This revolution is happening whether we like it or not. We live among a new student generation (born between 1980-1990), called Net Generation that learns and communicates differently, relying on instant information from the Internet and on computers as a feature of every day life. They are always connected: they are the 'digital natives'. We have tried to address the needs of the n- Gen by establishing virtual classes (virtual models of traditional classrooms), we have created significant amounts of digital learning objects (LOs) but we still find it difficult to meet the expectations of the n-Gen with these virtual classrooms and electronic learning support. Our best efforts fall short of satisfying the n-Gen need.

What is the problem?
While they, too, benefit from this connect world teachers have tended to stay in the comfort of their classroom, continuing with traditional lecture styles and using traditional pedagogical tools. They are not exploiting this digital connectivity.

Education and Culture DG

Lifelong Learning Programme

This 24 month long project is a collaboration of 11 partners from five countries. The project was to 'valorize' the results and innovation transferred from of two earlier successful LdV projects: SLOOP and NETIS.

The SLOOP project (Sharing Learning Objects in an Open Perspective) demonstrates key concepts in e-learning 2.0; NETIS provides the philosophical, sociological, and pedagogical basis to support new paradigms of teaching and learning in the Information Society.

The aim of Tenegen project is to establish an environment of 'connectivism' for VET teachers and trainers, to show the significant advantages of being connected to the n-Gen instead of simply 'delivering' knowledge through virtual classrooms and LMSs.

The project utilized the earlier development of NIVE and Prompt's "e-Learning - the future of the school" online course for VET teachers.

Tenegen consortium

"There is no desire more natural than the desire for knowledge. We try all ways that can lead us to it; when reasons fails us, we use experience ... which is weaker and less dignified means. But truth is so great a thing that we must not disdain any medium that will lead us to it."

Montaigne

E-learning A jövő iskolája

SLOOP

NETIS Network for Teaching Information Society

PROMPT EDUCATION

Co-ordinator:
Prompt-G Educational Centre for Informatics
Testvérvárosok útja 28. , Hungary, Gödöllő (H-2100)
Tel.: +36-28-430-695, Fax.: +36-28-415-434
E-mail: edu@prompt.hu, Web: www.prompt.hu

PROBLEMS

According the latest surveys European schools have significantly improved their technical ICT infrastructures in recent years. We have also found that there have been essential improvements regarding the basic ICT competencies of VET teachers.

Despite these positive tendencies, e-learning methods have not been integrated into schools' pedagogical programs to an expected level, not even in the front-running countries. Wider e-learning developments do not seem to reach our initial target group – VET teachers – and hence the primary target group, VET students.

An overall European monitoring process of e-learning led to the results, published in "E-learning Page Potentials in E-Learning in Lifelong Learning" (Thematic Monitoring Group 5, Sofia, Bulgaria, March 2007). According to it, with respect to the effectiveness of e-learning in achieving the Lisbon goals, one of the crucial points is "to improve the technological, pedagogical competences of teachers".

OBJECTIVES

- elaborate Tenegen pedagogical model for teachers' online further training based on the theory of connectivism, aimed to develop teachers' eLearning 2.0 competences.
- Tenegen Competency Framework and course design based on it, to ensure consistency among the learning objectives and course components.
- Tenegen Textbook in three languages
- Online course in three languages for develop teachers' e-learning competences. Five modules with traditional e-learning 1.0 course components (core content, self assessments assignments, glossaries, quizzes, feedbacks, repository etc.) and with collaborative tools (blogs, e-portfolios, other web 2.0 tools) to engage teachers communicating, authoring, knowledge sharing in online community.
- English, Hungarian, Turkish networking platform for teachers with Tenegen modules.
- Repository of teachers' self created Learning Object and platform of their own created online courses.
- Piloting the course with teachers and trainers in Europe, validation and verification and dissemination of the results.

AIMS

The aim of the project was to establish the TENEGEN networking environment, in which teachers will not only study, but will also experience contemporary e-learning methods – by cooperating, communicating, creating and sharing knowledge – where they will learn why it is so important for the NET Generation "to be connected".

"Teachers are still hesitant to work with digital learning platforms. New tools, such as blogs are only slowly being explored and integrated. Teacher support is an ongoing need as more than half of respondents do not think that teachers in their school use ICT confidently. Moreover, the educational value of new personal devices such as ipods and MP3 players is not clear to them."

(ICT in schools: trends, innovations and issues 2006-2007. Anja Balanskat, Roger Blamire, European Schoolnet)

We are convinced that the formerly developed training programmes failed to effectively involve the teachers in knowledge generation and networking. This fact is the main hindering barrier of the integration of ICT into the daily praxis (and pedagogical programmes) of European schools.

TARGET GROUPS

- Teachers and trainers of vocational and adult education
- Headmasters of VET schools
- Staff of higher education
- Students of VET schools
- University students
- European e-learning providers

TeNeGEN

NETWORKING ENVIRONMENT helping Teachers to reach the Net Generation

Teaching methods have to continuously change and adapt to suit the needs, and meet the expectations, of our information society. Whether we willingly accept this or not this revolution is happening. There is a new generation of students living amongst us - those born after 1980 - and now called the Net Generation. These students learn and communicate differently from previous generations. They find information quickly and readily from the Internet, as part of an every day life which is now unthinkable without computers. The places where education takes place are not only the schools any more but also the self organizing virtual communities beyond institutional control. No doubt that the teachers are challenged by the Net Generation: most of them are digital immigrants, growing up as a *"typographic man"*[1] while their students – the digital natives – need new media literacy to become critical consumers in the network where they are always connected. The European level educational strategies stressed the responsibility of the teachers in "Learning 2.0"[2] , the conceptualizations of the actions to treat the problems.

"As underlined before, teachers play a pivotal role in facilitating innovation in E&T. …

Advanced digital competences, comprising the confident and critical use of ICT for work, leisure and communication, are becoming increasingly important (Ala-Mutka et al., 2008). Teachers need to be equipped with these digital competences and be enabled to ensure that their use of social computing tools is not only beneficial to their learners, but also respects their safety and privacy. At the same time they need to be supported in raising the advanced digital competence levels of their learners by encouraging a reflective and critical attitude towards the reliability and safety of online learning resources and environments"

(Bedecker, 2009.)

Compared to the key principles of educational developments of the recent years, the ideas mentioned above are unique. Apart from constantly emphasizing the need for developing teachers' ICT competences the author points out that participating in network collaboration is vitally important to be able to improve their pedagogical methods required by the digital age. In order to progress towards this direction the methods of teachers' further training must be reconsidered. Training teachers for using software applications in traditional classrooms will not be sufficient at all to develop advanced networking competences.

This was the main challenge in the Tenegen project which we managed to meet: the traditional knowledge distribution was embedded in an environment providing the same experience of networking which is a feature of every day life for their students. As a result of a five module online course is offered by Tenegen consortium in three languages (English, Hungarian and Turkish).

Mária Hartyányi
project coordinator

[1] Marshall McLuhan: The Gutenberg Galaxy. The Making of Typographic Man. University of Toronto Press, 1962

[2] Bedecker, K., Ala Mutka K., Bacigalupo, M., Ferrari A., Punie, P.: Learning 2.0: The Impact of Web 2.0 Innovations on Education and Training in Europe, European Commission, Joint Research Centre Institute for Prospective Technological Studies, 2009

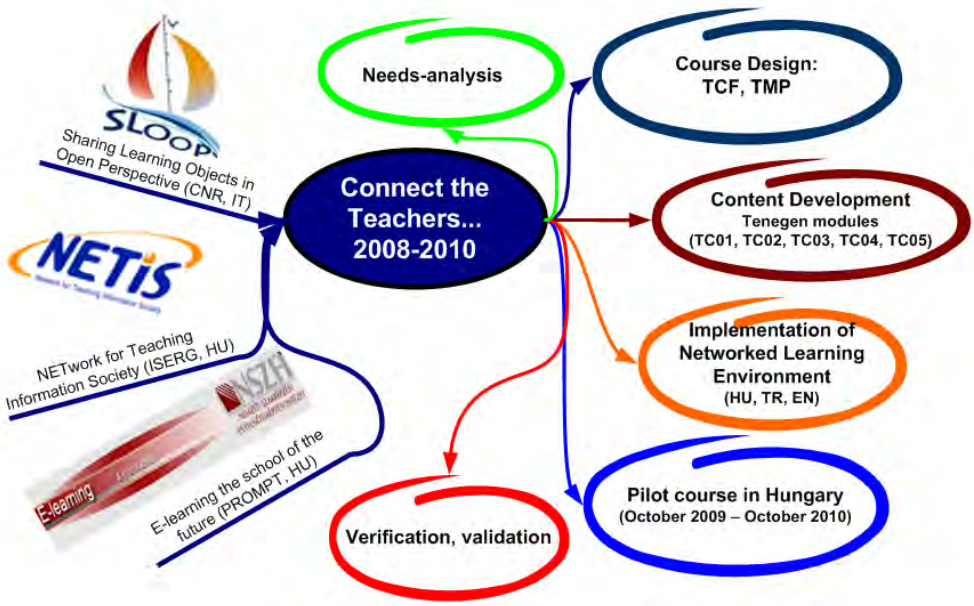
INTRODUCTION TO TENEGEN PROJECT

Prompt Education – the initiator of Tenegen project – accredited in 2005 a three module training program in Hungary to develop teachers' e-learning competencies. The course was delivered in typical e-learning 1.0 approach implemented in Moodle LMS with "traditional" online course components. The first module included general overview of e-learning concepts, presenting the successes and failures of recent years. The second one covered the e-learning design (writing synopsis and storyboarding), the creating/selecting/evaluating e-learning objects. In the third one the participants learned how to establish e-learning course in Moodle by using digital assets they created in the first two modules. Their last assignment was to organize a classroom event based on their development and to evaluate it against the pedagogical aims they defined in the synopsis.

About 300 Hungarian teachers took part in the training during the years, and gained basic competences in designing and developing learning objects, managing learning/teaching process in LMS. However in 2008 we had to realize that the typical e-learning 1.0 solution was not able to mediate e-learning innovation any more.

In the frame of Tenegen project the consortium[3] intended to renew the Hungarian modules by integrating the innovations of two earlier LdV projects. These were the NETwork for Teaching Information Society (NETIS) and Sharing Learning Objects in an Open Perspective (SLOOP).

We wanted to form an **open learning platform for a living online collaboration, to involve the teachers into an exciting discovery together with contemporaries.**



Tenegen as Transfer of Innovation – inputs and outputs

[3] TENEGEN partnership coordinated by Prompt Education (HU): National Research Council - Institute for Educational Technology (IT), Information Society Research Group, University of West Hungary (HU), CAPDM (UK). National Institute of Vocational and Adult Education (HU), Balkesyr University (TR) DEKRA Akademie Gmbh (DE), Öveges Öveges József Vocational and Grammar School (HU), Bottyán János Vocational Secondary School (HU), Krúdy Gyula Vocational and Secondary School (HU), Széchenyi István Secondary Grammar and Comprehensive School (HU).

Another crucial aspect was: the traditional knowledge distribution methods should widen in Tenegen with the networked learning theory aspects, however the e-learning 1.0 components should not be dropped out: e-learning 1.0 and 2.0 components should complete each other in Tenegen.

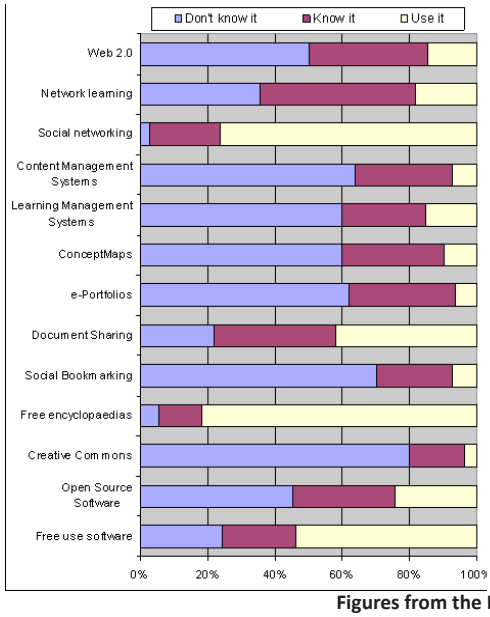
E-learning 1.0 ⟷ **E-learning 2.0**

A technology supported variant of traditional knowledge distribution, the virtual extension of texbooks and classroom teahing. The digital version of traditional learning, in which the learning remained a passive process, managed from above or outside.

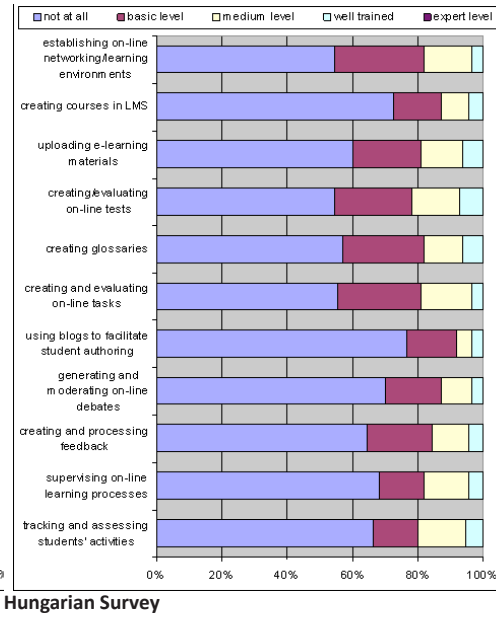
Information exchange and knowledge generation based on collaboration and on the students' activities. Associative learnin supported with electronic tools. The participants are involved as content providers in the learning / teaching process.

To measure the preliminary e-learning competencies of the teachers an online survey with 40 questions was carried out in Hungary, in Turkey and in Germany. The figures generally proved the assumptions: the teachers are far not trained in e-learning methods, they are not aware of the pedagogical potential of the online collaboration and e-learning tools, they are not really aware of the networking attitudes of their students.

Do you know the concept of...

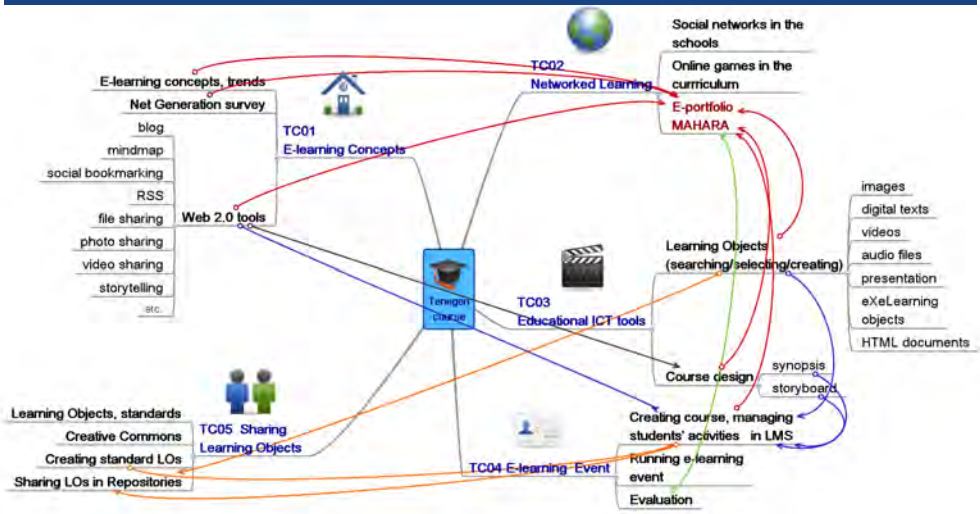


Are you trained in...



Figures from the Hungarian Survey

MODULES OF TENEGEN PROJECT



Tenegen Modules

In the Tenegen Competency Framework (TCF) the learning objectives, skills and competences were thoroughly defined and assessments were constructed with learning outcomes in mind. We used standards suggested by experts of our English partner, CAPDM, and applied course designing templates of the Hungarian accrediting system, in order to reach a very strong consistency among the applied course components and the learning objectives.

We were aware of that the strong course structure, the well elaborated core content and multimedia objects to support the learning process, the learner centered environment with collaboration tools were all only the necessary but not sufficient conditions to generate the collaboration.

"Connectivism considers learning as a process in which the role of informal information exchange, organised into networks and supported with electronic tools, becomes more and more significant. Learning becomes a continuous, lifelong system of network activities, embedded into other activities. The motivation for gaining and contextualising information becomes stronger if searching and evaluation becomes a cooperative, network activity. Students can significantly improve the efficiency of their learning if they take part in a network, or virtual community dealing with the given subject. Thus the collective knowledge once again becomes a source of individual knowledge ("cycle of knowledge development"). As the number of cooperative activities increases, personal social networks become the scene of informal exchange of expertise, and "communities of practice"develop. Besides the questions of "how" and "what" to learn, we now have the question of "where to learn"."

(Bessenyei, I., 2007)

THE PILOT

Sixty Hungarian teachers and trainers from all educational levels participated in the one year long online collaboration. The implemented Moodle environment supports a constructivist approach to learning through by its modularity, and makes easy the integration of Web 2.0 tools like the open source e-portfolio system Mahara. The standard e-learning 1.0 course components (core content delivered by different media, learning guides, glossaries, self assessment tools, assignments, quizzes, built in games, etc.), and the web 2.0 tools (blogs, social bookmarks, storytelling applications, mind-mapping tools, RSS aggregators, social networks, e-portfolio) were combined in the platform.

The participants were asked to comment and to complete the course content, to create new entries into the glossary, to attach relevant publications to the topic. At the end of the units they were asked provocative questions related to the content (for example: Are the schools really killing the creativity of the children?), and they were invited to reflect on the questions in a forum topic.

One of the most successful collaboration emerged in the research started to resolve questions including "Are there really members of the Net Generation sitting in my classroom?" The participants developed an online questionnaire, carried out the survey with his/her own students. The results (1080 samples) were analyzed on webinars, on a discussion forum (150 comments!), and the consequences were published in the blogs of the participants. Based on the results an academic research has been started by a team of the University of Eötvös Lóránd.

In the lessons on web 2.0 tools we presented the applications by video tutorials, with detailed descriptions, but we did not suggest how to use them in classroom work. We wanted to make the teachers to discover the pedagogical potential of the tools. In the blogs we could read several creative idea and even classroom experiences related to the special subject of the teachers.

In every phase of the course the teachers were asked to authoring online, to create digital learning objects. At the end of the course they had a collection of digital assets as a demonstration of the developed competences and they built their own e-portfolio from the collection.

CONSEQUENCES

The heavy collaboration required a constant presence of the staff which was sometimes overwhelming for them. It was the most exciting teaching and learning experiences not only for those working in designing and running the course but also for the participants as they stated it unanimously on the conference closing the course. Teachers - who had no online experiences before - became active, authoring members of the online community. The questions raised related to the methodology, the utilization of the huge amount of user generated content; the methods to analyze the forums from sociological points of view should be answered by further research.

"Working with Tenegen was a relief. I was freed from the necessity of endless development, from building an e-learning cathedral for its own sake. I realised for the first time that I do not need to "set the Thames on fire". My real responsibility is to find out how the interrelated contents can form an integrated whole, the sort of structure that my students need for support in their study contexts. I have also become aware of how human e-learning is.

As for the community; it is a really enthusiastic, teeming, web 2.0 community of people aiming to work and teach! The attitude this group has achieved is typical of hobby websites. It has meant that there is always someone available to trust, someone I can ask for help. It is a kind of instant-on, workplace chat room."

(Krisztina Fodor, Hungary, 2010).

PARTNERSHIP

„The power of collaboration and the ability of people to network with each other will trump almost anything else"

Mark Rosenberg

PROMPT
Prompt-G Educational Centre for Informatics HU

CNR
National Research Council (CNR) - Institute for Educational Technology IT

ISERG
Information Society Education and Research Group at the University of West Hungary HU

CAPDM
CAPDM Ltd., UK

BUNI
Balýkesir University TR

ÖJSZIGK
Öveges József Vocational and Grammar School HU

NIVE
National Institute of Adult and Vocational Education HU

BJMSZ
Bottyán János Vocational Secondary School HU

KGYGIVSZ
Krúdy Gyula Secondary School HU

SZIGSZ
Széchenyi István Secondary Grammar and Comprehensive School HU

DEKRA
DEKRA Akademie GmbH DE

Results : Tenegen Networking Platform in three languages

Five modules online for developing teachers' eL-earning 2.0 competences in three languages

http://tenegen.eu/tmoodle

http://tenegen.eu/course

http://tenegen.eu/ders

TC01 - E-learning Concepts
TC02 – Networked Learning
TC03 – Educational use of ICT tools
TC04 – Setting up Moodle course
TC05 – Sharing Open Learning Objects

Tenegen Modules

TC01 - E-Learning concepts


This module will help teachers to understand and apply the basic concepts of technology based teaching/ learning (the e-learning state of the art, the e-learning trends). They will be able to navigate, collaborate and hold discussions in the e-learning environment. They will be able to describe the main features of on-line learning management systems, the existing standards and will be able to select the appropriate LMS for achieve their pedagogical aims. They will be a ical methods and the pedagogical programme of their schools. They will be able to identify and categorize Web 2.0 tools, and to explore their pedagogical potential.

- Conceptions and history
- E-learning solutions, standards and trends
- Learning Management Systems
- Educational Multimedia
- Teachers challenged by the Net Generation
- Web 2.0 tools – panorama
- New roles of Teachers

TC02 – Networked learning



An active knowledge exchange of the net generation takes place on the Internet in several networks. The main objective of the module is the systematic use of this potential in the education. The module gives an introduction to the network theory and to the connectivism as a learning theory. The module introduces in use of interactive 2.0 tools in the networks. In this module the teachers will explore the ways of collaborative network learning, of collaborative knowledge building and of educational knowledge management. They will create e-portfolios, they will learn how to use e-portfolios and how to organize the learning into network.

- Introduction in the main ideas
- E-portfolios in network learning
- Social networks in education
- Educational use of social games
- Educational use of blogs
- Social bookmarking

TC03 – Educational use of ICT tools

In this module the participants will get acquainted with the planning of an e-learning curriculum, how to plan and document the steps of creating an interactive multimedia. They will learn what a synopsis and storyboard mean and how to prepare them. At the end of the module the participants will be able to create or collect e-learning objects to a special part of their subject, they will plan an e-learning event based on these e-learning objects.

- Designing eLearning curriculum/event by using synopsis and storyboard
- Media elements: features, specification
- Ergonomic aspects (Text, Image, Audio Video, Animation)
- Create and edit media elements using applications
- E-learning material: integration of the elements, publishing online

TC04 – E-learning events in Moodle

The aim of the module is to prepare the participants to work in an open source learning environment (LMS). It gives detailed, practice-oriented demonstration of the learner-side and teacher-side activities, and gives an introduction how to administer in the environment. The participants will be prepared, how to manage users, how to create courses, how to integrate e-learning content and activities. They will be able to design, create their own course, to publish tasks and tests for students, to supervise the learning event, generate collaboration and communication, and use methods to assess the learners' activities. They will and evaluate it against the pedagogical aims.

- Design e-learning event
- Create Moodle courses
- Adding resources (Text, Web page, Link, etc.)
- Adding activities (Task, Chat, Blog, Forum, etc.)
- Roles in Moodle
- Management of users' account
- Assessment tools, learners' records
- Evaluation tools

TC05 – Sharing Open Learning Objects

This module will help the participants to understand the "open" philosophy/model which has been successfully adopted in the field of software development; to identify the state of the art concerning Learning Objects (LOs), LOs standards and LOs repositories; to describe the features of a specific model for learning object, called openLO; to discover the opportunities, for schools and teachers, of a sharing/co-operative approach in LOs production.

- Using eLearning to enhance teaching and learning in schools: the learning materials, a critical point,
- Reusability, adaptability, interoperability: the Learning Object model and the SCORM and LOM standards.
- The "open" model: free/opensource software and open content. The copyleft licences.
- The openLO model: technical, pedagogical and legal aspects.
- Learning Object Repositories: features and characteristics of the principal digital repositories.
- The freeLOms: an environment where to share and produce LOs in a co-operative way.

SECTION 1

NETWORKED LEARNING

„The information society is the society of self-exciting knowledge gaining where the main source of economic value is knowledge. The information revolution challenges schools, changes education and organizational-institutional frames of education. The nature of knowledge becomes multimedial, transdisciplinary and practical. At the same time, the paradigms of obtaining knowledge are changing also: lifelong learning becoming the dominant pattern, the conceptual difference between child and adult diminishes and formal scholar institutions have turned into open virtual environments. Printed material looses its place in communication mediums and virtual learning will become familiar …" (Nyíri 2003:1)

When discussing network learning we should consider the words of M. Buber: „In the beginning is relation". Mankind is more social than cognitive. Emotions, knowledge and closeness of partners have at least as strong motivation as students' incentives, assessment or an exciting content. It is an old story: mutual exchange of experience, student-pairs, helping each other, following the same age groups, all existed before the internet. However, with the new communicational tools, the storage of personal knowledge and the mutual exchange of knowledge are made much easier, as is the storing and sharing of personal experiences and taking part in organized network learning and teaching.

As Zsolt Kulcsár writes:

> „Knowledge is not acquired but created. By reading an article or description does not mean that I'll become an expert of that field. For deep comprehension, knowledge has to be organized: I have to review what I think about it and create content for setting up an image in my head. Knowledge is experience. It is impossible to be familiar with every field therefore; we also need to lean upon others experiences. For profiting the most from a community's knowledge first, you have to be a member of the given community. The more you share with others, the more you pay attention that the content you have created must be understandable and useful, the more you will profit from the community."

When talking about network learning we have to understand that it is not just about the effect of social psychology but also a cultural paradigm change. Before printed books, learning was based on verbalism and imitation: knowledge was stored in stories and distributed in social activities. In verbal culture, knowledge was based on a local community's direct experiences, verbal transmission, imitation and holistic learning. This connection between experience, community and knowledge has almost vanished, replaced by our modern day specialized institutions. The invention of the printed book was a key turning point: knowledge separated from its carrier, became objectified, and in text form became available and transferrable to everyone. This is the base of typical scholarly cognition today: individualized experience gained from books.

As Kristóf Nyíri writes: "compared to this, electronic communication is a return to simultaneity, cause and effect, action and reaction in other words to the characteristics of times before writing." (Nyíri 1998).

With the help of the newest, interactive tools of web 2.0, personal experiences can be stored, written, made aural and visual, and reintegrated as community shared experiences.

When comparing the difference between aural and visual communication we have to understand that aural communication is real-time, interactive and social. This is what makes network communication attractive for today's new generation.

Orality	Literacy
aural	visual
impermanence	permanence
fluid	fixed
rhythmic	ordered
subjective	objective
inaccurate	quantifying
resonant	abstract
time	space
present	timeless
participatory	detached
communal	individual

(Source: Pete K.)

Network learning gives us a chance to match the advantages of traditional writing with the advantages of having small communities of self-organized networking learning activities. It certainly does not mean that the new tools will drive out older culture since book culture – with its millions of scanned books – will exist forever. This traditional culture can be enhanced with straight experience exchange, discovery and knowledge sharing hidden in more modern media using stories, novels, pictures and videos. For its effective adaptation we have to become acquainted with the doors between the two cultures; experience the pros and cons of these tools; and understand student life styles, their alternative learning methods, their sub cultural practices, and the differences between their knowledge from that of adults.

CHAPTER 1: ABOUT THE NET GENERATION

How can we talk about Digital Natives or the Net-generation without knowing this generation deeply? Exciting international discussions are going on about this question. In these discussions, there is no common language yet between the statements of Anglo-Saxons educational culture and Central-European didactic education. A characteristic example is the discussion between Marc Prensky from New York who was one of the first to propose this subject and a German professor Schulmeister. In Prensky's article from 2001 he writes about Digital Natives and Digital Immigrants. In his argument the author points out that there is a significant difference between Digital Natives' thinking patterns, their brain's structure, perception, socialization and learning habits, from those who grew up before the digital word. His article stirred a large debate.

Americans Jukes and Dosaj (Jukes/Dosaj 2006) quoting Prensky, demonstrating the cultural differences between Digital Natives and Digital Immigrants:

Digital Natives	Digital Immigrants
Prefer receiving information quickly from multiple multimedia sources.	Prefer slow and controlled release of information from limited sources.
Prefer parallel processing and multitasking.	Prefer singular processing and single or limited tasking.
Prefer processing pictures, sounds and video before text.	Prefer to provide text before pictures, sounds and video.
Prefer random access to hyper linked multimedia information.	Prefer to provide information linearly, logically and sequentially.
Prefer to interact/network simultaneously with many others.	Prefer students to work independently rather than network and interact.
Prefer to learn "just-in-time."	Prefer to teach "just-in-case" (it's in the exam).
Prefer instant gratification and instant rewards.	Prefer deferred gratification and deferred rewards.
Prefer learning that is relevant, instantly useful and fun.	Prefer to teach to the curriculum guide and standardized tests.

(Jukes és Dosaj 2006:37)

In contrast to this, the German Rolf Schulmeister claims that this generation should only be called media-generation. His conclusion from secondary statistical analysis is that there is no brain rewiring, new thinking and learning patterns. The media use often fits into the contexts of the total leisure activities, for example, as a means of communication, making dates and maintaining personal contact. Young people rarely use it for learning or attempting assignments. According to Schulmeister the dominant functions, e-mail, chat, internet telephony and visiting community Websites, make clear that a large proportion of computer use simply serves the communication and maintenance of personal contact

„ ..it can be established that the classic media, such as television and film, enjoy the greatest priority with young adults and that their entertainment function has not yet become obsolete. It is interesting that listening to music is very popular especially among girls which owes much to the iPod and mp3-player and the fact that pleasure in music is ubiquitous."

There is no sign that future students have different learning habits or demand alternative didactic methods – continues Schulmeister. Entertainment and games play a role in group and individual activities, and are a useful way to support the processes of social negotiation, the acquisition of rules and the cognitive and emotional confrontation with obligations and problems." However, these activities do not belong to the terms of learning: "a transfer of the abilities gained from using the computer to learning does not seem to take place." (Schulmeister 2009:152-156).

The Central European learning system is quite different from Anglo-Saxon competence-based pedagogy, and from the theory of connectivism, network learning and collective knowledge exchange. It does not consider the creation of a complex game, learning its rules or its network management, as learning or acquiring abilities.

CHAPTER 2:
EDUCATION CHALLENGED BY THE NET GENERATION

"THEY are variously known as the Net Generation, Millennials, Generation Y or **Digital Natives.** But whatever you call this group of young people—roughly, those born between 1980 and 2000—there is a widespread consensus among educators, marketers and policymakers that digital technologies have given rise to a new generation of students, consumers, and citizens who see the world in a different way. Growing up with the internet, it is argued, has transformed their approach to education, work and politics." (Economist online, England, issue on March of 2010)

The theory of 'generations' - shown on the table below - was developed in the early 1990s by American sociologists Neil Howe and William Strauss. Each generation has its own 'character' – a character shaped by their most relevant economic, social and cultural activities and attitudes.

	Matures	Baby Boomers	Generation X	Net Generation
Birth Dates	1900–1946	1946–1964	1965–1982	1982–1991
Description	Greatest generation	Me generation	Latchkey generation	Millennials
Attributes	Command and control Self-sacrifice	Optimistic Workaholic	Independent Skeptical	Hopeful Determined
Likes	Respect for authority Family Community involvement	Responsibility Work ethic Can-do attitude	Freedom Multitasking Work-life balance	Public activism Latest technology Parents
Dislikes	Waste Technology	Laziness Turning 50	Red tape Hype	Anything slow Negativity

The American institute EDUCAUSE published a study in 2005 entitled "Educating the Net Generation" (Oblinger & Oblinger, 2005). This study was based on a survey which included several thousand high school, college and university students between the ages of 16-25. The questions focused on the issue of whether this generation was different from the earlier ones in respect of their habits of behavior, learning and gaining knowledge.

The answer according to the survey a definite: **yes**. It concluded that the age-group born into the information era between 1982-1991- have different learning behaviors to earlier generations. This section will summarize the conclusions of the survey, and highlight the main characteristics of the Net Generation as formulated by the authors.

GENERATIONAL FEATURES

The Net Generation are:

- fascinated by new technology: they are intuitively using the IT devices and navigate on the Internet, due to the fact that they spend many hours every day playing video games and being connected to the Internet.
- not bothered too much about the way technological gadgets work and mostly not even interested in that.
- reluctant to read a large amounts of texts, they are more visually literate than earlier generations.
- commonly using more than one medium at a time: they watch TV, talk on mobile

phones, listen to music or the radio simultaneously - they are familiar with "multitasking".

- fast at information consumption: they are used to receiving information very quickly, and they expect immediate responses.
- using technology intensively in their socialization: they are willing to join physical, virtual and hybrid communities as well.

HOW DO THEY LEARN?

The Net Generation:

- do not think linearly: "Let's build something from what we have and something will come of it".
- are results oriented in learning and impatient: they show unwillingness to work if the parameters of the 'why' and 'how much' are not clear; they start only when the exact rules, procedures, and schedules are clearly defined.
- prefer interactivity and "learning by doing" rather by being told what to learn. "The role having grown up with video games plays in this preference is unclear, but they learn well through discovery—by exploring for themselves or with their peers."

INFORMAL LEARNER OF THE INTERNET

What do they say about the technology and the net? Some student quotes:

"Technology allows us to learn as much as we want to about virtually any topic".

"I usually connected with friends either to get help or to help others."

"Technology is so embedded in our society; it'd be hard not to know how to use it."

They are aware of the fact that not every piece of information from the Internet is true. By communicating with each other they respect each others' opinion, often much more than that of their parents, e.g. if they have a health problem, they are more likely to ask about it in their net community rather than of their parents.

WHAT THEY THINK ABOUT TEACHERS AND SCHOOL?

"Teachers are vital to the learning process. Tech is good, but it is not a perfect substitute". Computers can never replace humans"

"Learning is based on motivation and without teachers that motivation would cease to exist".

"A major part of school is building social skills. If we were to always communicate trough technology and not in person, then the way we would live would change dramatically."

Nowadays there are thousands of studies about the Net Generation, digital natives and immigrants, and there are many different opinions found in these studies. The English online magazine - the Economist - published an article in March of 2010, and invited readers comment on it. Among the people who commented was Don Tapscott, who was one of the firsts educational researchers to draw attention to the Net Generation.

"This is an actual generation and **they have different brains because how you spend your time during adolescence is the main determinant of brain development.** They are a powerful force to change every institution in society. This research is summarized in my 2009 best seller Grown Up Digital: How the Net Generation is Changing Your World."

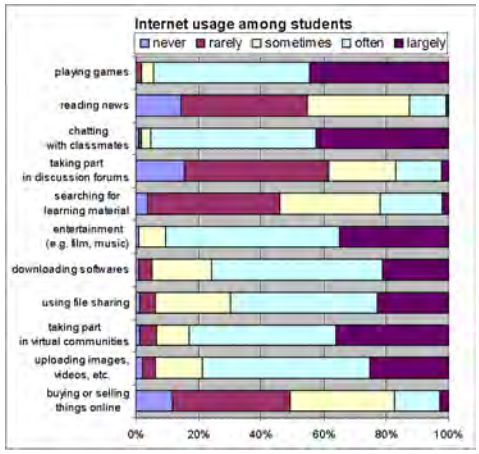
Not all comments agreed with Don. Comments from the opposing view included:

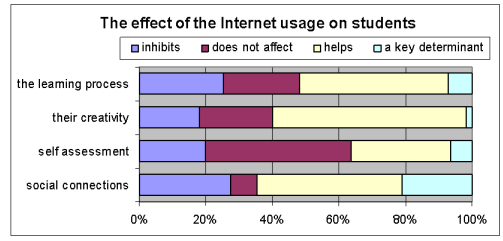
"The only noticeable differences of this so called digital generation are: they think the plagiarism is a right, cut-and-paste is writing, uncritical thinking is cool, attention deficit is a virtue, incoherent thought is also cool, being smart is dumb, swearing often is natural, being polite is stupid, form over substance is IT. What a great generation for humanity!" (Anonymous)

"The Digital Native myth is quite damaging to teacher professional development, I think, because it tells somewhat confidence-deprived teachers that in their middle years that they can never catch up with their young super-whiz students. In fact, from my experience, the qualities that are most needed in teachers using the new technologies are not so much to do with computer skills but thinking skills and mental flexibility. For example: skills to judge whether a Wikipedia article is credible." (Anonymous)

NET GENERATION IN HUNGARY

In the survey carried out as needs analysis we asked Hungarian teachers what they are thinking about their students' networking attitudes. Do they think networking hours useful for learning? You see the figures below:





Source: Non representative survey to measure teachers' e-learning competences based on 120 samples of Hungarian teachers (Tenegen, 2009)

As shown by the figures, teachers do not think that their students are learning while being connected. More positive picture is presented by the second diagram: for more than 50% of Hungarian teachers think that Internet usage helps students in developing their creativity.

CHAPTER 3: EXPERIENCES IN TENEGEN

The aim of the unit dealing with the Net Generation was to involve the teachers in collaboration by discussing the questions on the forum:

What about your students? Could you discover the same networking and learning attitudes among your students described in the international studies? Do you think they are belonging to the generation called digital natives? What do you think you are a member of the digital immigrants?

At the same time participants and tutors elaborated an online questionnaire for the students to make the experiment more exact. The teachers were free to use the questionnaire or to carry out interviews in the classrooms. Than they were asked to summarize the conclusions of the survey and the forum discussions by submitting an assignment with answers on the questions:

- What are the students' attitudes toward learning in your own country (students between 13-18 years of age)?
- Are you familiar with their networking attitudes? If so, can you describe them?
- How important are virtual communities for them?
- Is the expression: "*they are always turned on*" true for them?
- How could the time spent on the Internet be better utilized at school? Do we have the tools, methods, or approaches to do this?

WE PUBLISH HERE SOME OF THE TEACHERS' DISCOVERIES:

I prepared kids for high-level IT graduation (Just received a notification that the oral exam was OK). They are very clever. They are really kids of the online world. A number of their attractions were stunning to say the least. They were able to reach their home PC's at any time, and access all of their data. The things they could do with their super phones were just sort of miraculous. I soon realized that the teacher is basically only a facilitator. Apart from the new things I could offer them, I enjoyed their incredible creativeness, and the way three of them could solve a problem in three unique ways.

• While learning, they do not ask us for help via the Internet. Maybe it's our own fault, because a lot of teachers do not like to use, or are not even able to use the computer or the Internet. Be it for educational or private purposes. The students are reluctant to inquire in such a form anyway, or any other way for that matter! Wikipedia, however, is used often for help as well as their friends and peers. The survey also confirmed that the children would appreciate having all of their teachers available via the Internet. Since they not only use the Web for social interaction, but for searches on real subject matter and learning possibilities.

• Before the survey, I thought that very few students use the Internet for learning. I was pleasantly surprised and delighted that this generation is discovering it can be used for more than just games and music downloads. I still think, however, that we as teachers should encourage them to make full use of the Internet and we should also

incorporate it into our curriculum. Doing so we will both benefit and the school hours can be much more interesting and exciting at the same time. The board as well as Agora (*forum of Tenegen course*) agree with me, that it is the teacher's responsibility to show the students the almost limitless possibilities the Internet has to offer.

• The possibilities are endless. For example, ill students can have their classmates scan and e-mail the daily topics to their home (almost every family has a digital camera). After class, the ill student can exchange information instantly using the widely available messaging services. Not just those missing from class but anyone can find solutions to problems and get a wealth of information on any topic. Classmates are usually available together at one time. This is truly a positive phenomenon! The top five online activities in the group are as follows: browsing, downloading music, download movies, browsing social networking sites and games. Learning only comes after these and at the end of the line is posting on forums and running errands.

• Those curriculum's that highlight multimedia are the most sought after. They were puzzled at the question of whether learning from these is more effective for them or not, but it was apparent that the audio/visual aspect makes learning much more fun for them. None of them claimed to remember the material better if given in textbook form. Interestingly, the content available digitally was printed out even if it's not particularly suited well for this (for example, if the document was packed with external links). Overall, it seems difficult for them to reconcile their way of learning from the past with that of the Internet: the latter is for the most part associated with entertainment.

• As I previously suspected, but now is quite clear, that it is the students who spend several hours on the I nternet daily are in the majority. 2-4 hours a day seems quite a lot to me (this makes up 33%), but 4-6 hours or more of browsing the net is straight-out horrific. Therefore, it is increasingly our responsibility to make sure the students spend at least a part of their time on the net learning . On a positive note, only 5% of the students have no net access, so the odds are in our favor that almost any student can be reached through the network with new teaching and learning tools.

• Monday. After the break. I don't think it's a mystery to anyone what my feelings were this morning when I woke up. Although with the changing of hours I finally didn't have to wake up to dark :) It was refreshing to see my colleagues with smiles on their faces on arrival - I hope this afternoon is relaxed and calm and that I'll be surrounded by well rested people. Realizing the situation I expected my the first few hours would be spent trying to get my students to wake up, hoping most don't wake up in the manner I usually do. - An angry lion is a pussycat compared to me :) - I figured I would try to strum through this past curriculum. It would help us decide whether we need fresh start, or whether we will be able to proceed from here :(Toward the middle of the class we "accidentally" stumbled on the phrase "net generation". I am sure that most places don't really have a problem with this term. We will start with the interpretation of the term generation and then blend the two together. The result, to my surprise, was the 80's along with all those born during that time. So this challenge has been won. By the end of the conversation the sleepy eyes were opened, and in them appeared the glow of belonging. It was worth enlarging the framework of the TT:) Thanks Tenegen:) (Matuz Eve)

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Related videos:

A Vision of Students today (Created by Michael Wesch in collaboration with 200 students at Kansas State University.)

Marc Prensky: Twenty-first century learning, teaching and technology

SECTION 2

E-LEARNING OVERVIEW

Computer based training, or education, has its roots in the 1960s. The technology was developed mainly for the training of individual trainees connected to a computer, but without any online support as we know it today.

According to Wikipedia (http://en.wikipedia.org/wiki/Distance_education) distance education, however, can be traced back to 1728 in Boston – a long time before the World Wide Web was devised in 1990. Though separated by many years, these technologies and methods of learning converged to produce what we call e-learning. There is no generally accepted meaning for the term. One of the major thinkers in e-learning is Elliot Maisie, (http://www.masie.com), his definition is:

"E-learning is the use of network technology to design, deliver, select, administer, and extend learning".

Within the European Commission's E-learning Initiative (http://www.elearningeuropa.info), e-learning is defined as:

"*E-learning means using the new multimedia technologies and the internet to improve the quality of learning*".

Bringing these together we can define e-learning as:

E-learning is the use of new media and network technologies to design, select administer and extend learning thereby improving its quality.

With the development of the collaborative and social technologies of Web 2.0, it became possible to implement collaborative technology enhanced learning. This is some times called e-learning 2.0. or Technology Enhanced Learning – TEL. There are some important questions that should be asked of these approaches:

- What do these technologies offer to a teacher?
- Are these technologies just for games and entertainment?
- Or, do these technologies offer students a real opportunity for learning?
- Can these technologies improve learning for students?
- What does today's school generation expect from us?
- How can the web technology help?

At the moment it is difficult to predict how the networking technology will change our learning habits, our teaching and pedagogical methods. We do not have ready made recipes for utilizing the new tools. The last years cannot be considered a success story of e-learning at all. The technological innovations have frequently tempted us to be too optimistic. It is clearly proven that the „e" prefix in itself will not solve the problems of the educational crisis worldwide.

We must be aware of the fact that there are no instant answers to these questions and no instant solutions to meet the challenges of the Net Generation. Not to mention the importance of involving the practicing teachers.

This chapter will help teachers to understand and apply the basic concepts of technology-based teaching/learning – the history of e-learning, the technological innovations behind the emergence of the e-learning developments and trends. In order to achieve our objectives we have to understand and utilize the findings of the past.

Technological Forecasts - Communications

In November 1992 (15 years ago!), Scientific American published a special issue on communication, computers and networks [1]. Here is a quotation from the article by Michael L. Dertouzos, employee of MIT. The author predicted that:

- business letters will arrive in 5 seconds instead of 5 days,
- designers and manufacturers living in continental distances from each other will be able to cooperate,
- electronic purchasing will become a possibility,
- parents can stay at home with their children while working for a remote company,
- recreational locations will be chosen electronically,
- films can be purchased electronically,
- retired engineer from Florida teaches algebra for high school students in New York ,
- the new infrastructure lightens the gap between the poor and rich."

Teachers Online

At the portal at http://www.ziizoo.com different tutors are wanted for different subjects. After selecting a subject, a list of the teacher candidates is received. If he/she is available then contact can be made. After a short introduction, information can be received about the price of his/her lessons, the number of his/her students and about how his/her methods, teaching is evaluated by the students.

In 1992, then, this scenario seemed to be a utopia; today it is almost reality. According to researchers, the social effects of this change can only be compared to Gutenberg's innovation of printing. Book printing made possible the accumulation and distribution of human knowledge on an industrial scale. Will the information age predict the end of the Gutenberg-Galaxy (en. wikipedia.org/wiki/The_Gutenberg_Galaxy)? This prospect, for many of us who were raised in the 20th century, does not seem to be so welcome.

History however may provide some peace of mind. On many occasions there has been the expectation of quick, and life-changing, benefits from various technical inventions. However over time, and after the early elation is over, there has been a realization that transformational change would take more time. The Japanese, for example, developed and published an information strategy in 1980 in which they defined innovations for the following ten years. Among these plans there were machine translation systems for spoken languages, solutions for speech recognition, and a 5th generation computer system with human-like artificial intelligence. After 30 years we are still waiting for truly intelligent, problem solving computers.

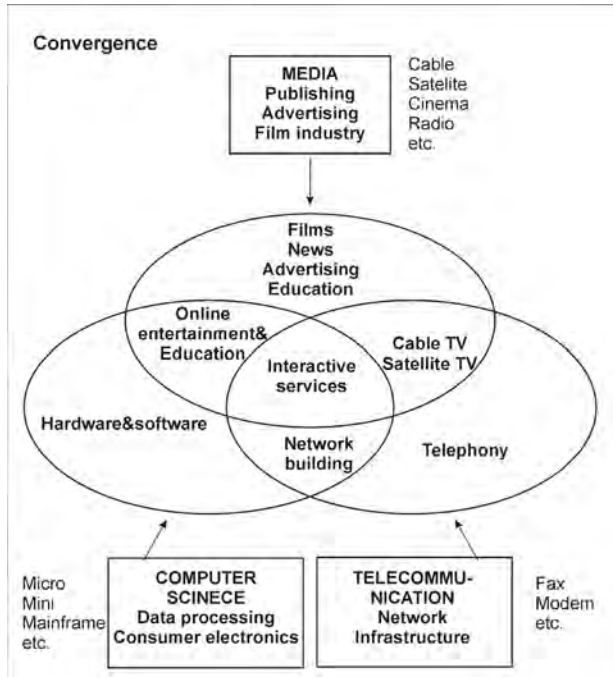
CHAPTER 1: E-LEARNING AND ICT

The generation born after 1980 is sometimes called the net generation – the digital natives.

They are the first generation to become adults in the information society.

They know the underpinning technology of the information society in an almost sub-conscious way. What does ICT mean?

The acronym is made of the initials of "information and communication technology" or, more simply, info-communication technology. What is behind the evolution of this concept?



TECHNOLOGICAL CONVERGENCE, GLOBALIZATION

Sociologists have termed the 20th century the age of technological convergence and globalization. Earlier analogue technology was gradually replaced by an era based on digital technology. Digital video and television have appeared in recent years, for example, and analogue telephone lines have been slowly replaced by digital solutions. (Withington, 1967) Due to digitization the industrial sectors of:

- computer technology and computerized networks,
- telecommunication (telephone, fax), and
- audiovisual appliances (TV, radio, entertaining appliances).are gradually merging.

(Source of the figure: Communication World Report, Hungarian UNESCO Committee, Budapest 1988.)

This is called **technological convergence**. Mobile phones can be used for taking pictures, listening to music. With small communications devices we can connect to the Internet, and via Internet we can watch TV, listen to the radio and phone…

THE DEVELOPMENT OF COMMUNICATION TECHNOLOGY

Communication between people was revolutionized by the innovations of late 19th and early 20th century such as the telegraph, telephone, radio, and television. The foundation for these innovations was provided by scientific results in the area of magnetic science and electricity.

Computers with the Neumann-principles (1940-1955)

The principles of the logical structure of electronic computer appliances by János Neumann (1903–1957), Goldstein and Burks was published in 1946. The first stored program-controlled computer – the UNIVAC (1951) – was built according to their ideas, and was created for market sale, not a specific need.

Second and third generation computers (1960-1980)

The first transistor was invented at Bell Laboratories in 1947. With the application of transistors and ferric rings the so called second generation computers were created with a much smaller size and remarkably less heating problems as their predecessors, while at the same time being much faster and with a storage capacity improved by magnitudes.

The spread of high performance personal computers and the appearance of laptops (from 1980 until the present)

In 1958, the integrated circuit (IC) was invented and with it a new age – the age of microelectronics. This is the age of third generation computers which were built using integrated circuits. This supported execution speeds of millions of operations per second. Mass application of computers began by the end of the 1960s, but much more miniaturization was still to happen – evolving by leaps and bounds.

The fourth generation computer system was made possible by the application of VLSI (Very Large Scale Integration). In 1971, INTEL created the first micro-processor: a few thousand active circuit units executing all the essential functions in one chip. In 1981 IBM presented the PC (Personal Computer) based on the Intel 8088.

The improvement of storage capacity

While the speed of computers was increasing storage capacity proved to be more and more of a limiting factor. When von Neumann-principle computers were introduced magnetic information storage was known and used as a solution for saving data and programs. Introduced through magnetic drums, and, from 1951 magnetic tape units for third generation systems, we eventually arrived at fourth generation large capacity optical stores.

The development of input and output peripheries

In the 90s the mouse appeared as an input tool. It seems to be insignificant but in fact, when considering the everyday work done by computers, it was a very significant change. The first impact printers were followed by high-speed laser printers and multi-function office equipments. Cathode ray monochrome monitors were replaced by low TFT monitors.

Computer networks

The immense 'info-communication leap' was the development of computer networks in the 70s. This allowed the wider implementation of Internet applications, such as email and the World Wide Web, from 1990 till the present, and the increase of data transfer speeds and the basic capacity of the Internet. The amazing improvement of Internet technology underpins what is called 'globalization' today.

Globalization means world-wide standardization (making universal) of processes and the consequences of this in different areas of everyday life. Economic, financial and cultural (lingual) globalization determines our everyday lives.

Multimedia

The hardware support that makes it possible to send, read, listen to digitized multimedia information (images, video, audio) to/from any part of the world quickly and with high quality relies on multimedia technologies.

"*Nowadays we live in a new communication age with its enabling technology being wireless technology. Mobile phones have become universally adopted at a speed never experienced before. A new concept has become possible for the next generation of e-learning – 'm-learning' or 'mobile learning'. This is education delivered through mobile technology." (Keegan, 2005)*

The hardware support that makes it possible to send, read, and listen to digitized multimedia information (images, video, audio) to/from any part of the world quickly and with high quality relies on multimedia technologies.

The information society is a world model of 'globally' based knowledge. It accesses the whole the history of human civilization and culture. It came into being, and expanded from, the end of the 20th century (Pintér R., 2008). Its development, however, started in the 60s and 70s. The information society sits on an economy based on know-how, where information has become an asset. High quality technical investments and constantly upgraded information technology requires "lifelong learning" for the citizens of this society and so the problem of renewing our educational systems comes sharply into focus.

CHAPTER 2: E-LEARNING TRENDS

Computer Based Training (CBT) is not a new idea. In 1967 – more than 40 years ago – the US Computing Report magazine reported that astronauts who participated in Apollo mission practiced first on simulators before undertaking the task they had to accomplish in reality. In the 60s computer controlled simulator programs were also used to train civil and air force pilots.

Even in those days, teachers were worried about students spending too much time in front of the computers. Anthony Oettinger, Professor of Harvard University, expressed his thoughts in 1967 as "*They are not afraid of computers at all. All the more the problem is, rather, how to save them from becoming hostages of the computer*."

The widespread use of Internet and the improvements of multimedia systems have made educational applications more dynamic. By early 90s CBT migrated into today's e-learning. In 2004 e-learning 2.0 became a major focus and nowadays there is even mention of e-learning 3.0.

According to the most widely used definition e-learning is an educational form that uses the tools of information and communication technology (ICT) for improving the efficiency of education and training. The table below describes the most important stages of e-learning development.

As with computer generations, timing definitions are approximate. However the demarcation line between e-learning 1.0 and e-learning 2.0 is unusually clear. In e-learning 1.0 system students read, listen and adopt. They have limited options for interactivity, except in the area of simulations, or multiuser games. In the era of e-learning 2.0 there are innumerable tools to generate interactivity, for exchanging and sharing knowledge through the internet. Self-organized learning communities are also now rapidly developing, where there is a blurring of the difference between 'teachers' and 'students'

CBT 1960's	**E-learning 1.0** 1990's		**E-learning 2.0** 2004-		
COMPUTER BASED LEARNING MULTIMEDIA	Formal learning		Informal learning		
	Frameworks		**Web 2.0 tools**		
	Rigorous architecture, "cathedral" style LMS developments		Bazaar style developments – fast spread of easy to use online authoring tools		
			online authoring	communication	cooperation
	LMS	LCMS	easy to use tools for creating and publishing digital text, pictures, videos	instant messengers, forums, video conferences.	blogs, wikis, social softwares
	accessing, searching		**collaborating, creating, sharing**		
	The roles of teacher-student, author-reader is sharply isolated from each-other. In the centre of e-learning are the teacher and the learning material (content)		Instead of transferring the knowledge the teachers should take new roles of facilitating, moderating, and organizing of learning – the students are encouraged to become active participants of knowledge building process.		
	**Web 1.0**		**Web 2.0**		
	HUDIF	WebCT	digg Ning		

CHAPTER 3: PLATFORMS

There is a wide range of e-learning platforms (sometimes called Virtual Learning Environments or VLEs) on offer to users. These platforms deliver a range of complexity and versatility in their functions and services. Looking at the feature sets it is easily possible to consider an educational multimedia CD and Moodle platform as different types of e-learning solutions, as both are specific software applications. However at a first level, different e-learning systems must meet the same requirements as any other software, such as:

- providing stable and reliable operation,
- providing a comfortable, user friendly interface which complies with all relevant legislation in respect of accessibility and ergonomic requirements,
- offering tools for following and recording the users' activities,
- managing authority and authentication,
- compatibility with the host computer environment,
- minimizing system requirements for operation,
- easy installation,
- on-line user support,
- options to refresh software and contents,
- offering productivity support.

The most basic services of educational software are:

- to present learning material delivered in different forms and formats,
- to give support to users in their exercises and their practice with the delivered knowledge,
- to assess the results of the learning process and to give feedback for the learner.

Early off-line educational programs (the products of first-generation e-learning such as CBT) actually achieved many of the above requirements. However Multimedia CDs may have looked impressive but the content was very static in the sense that its content could be difficult or impossible, to refresh or update. The single user, multimedia approach reflected a traditional, rigorous educational approach: to deliver, to strengthen and to evaluate the knowledge acquired by the student.

It is difficult to find many examples of high quality productions where multimedia CDs actually achieved the targeted pedagogical objectives. However there are obviously some exceptions, for example many schools use "Tell Me More" – a language teaching series, which was introduced at schools several years ago. Interactivity is a standard requirement for off-line systems. It be can easily achieved technically (at the software level) because even a mouse click means interactivity. However, achieving interactivity which supports real pedagogical objectives can be very difficult.

On-line platforms operating on the Internet are second generation computer based learning innovations and can be classified as e-learning 1.0. Such traditional learning environments are usually developed to operate over a computer network. The learning system may also integrate some institutional services such as student enrollment or examination.

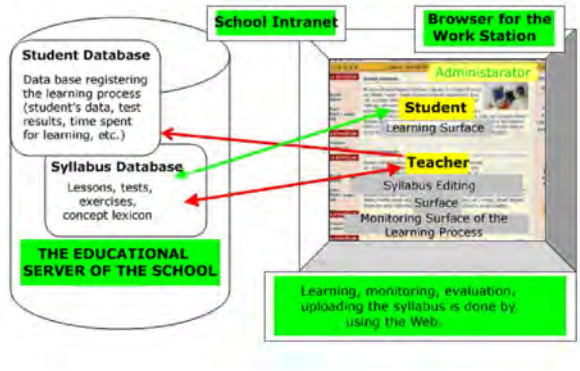
Services can be categorized in two major groups:

- supporting the learning process and the administrative work related to learning,
- supporting content authoring (creating, editing and updating learning materials.

The sub-system which supports the learning process is called a Learning Management System – LMS. The tasks of LMS are:

- managing authorities, monitoring access, registration of users,
- presentation of lessons,
- managing the assessments, scheduling the students' tasks,
- providing options for practice,
- supporting the tutor's activities
    - organizing courses,
    - managing enrollments,
    - recording students' activity and performance,
    - managing the evaluation of the students' performances,
    - producing records and statistics,
- supporting communication between teachers and students,
- supporting quality management, for example course evaluation via students' feedback.

What are the advantages of e-learning frameworks for schools? Some think that they only generate more work for teachers. However, e-learning frameworks have options that may substantially help educators' work in the long run. For example electronically stored lessons can be saved in such way that they can be edited, renewed and used again at any time. A common repository of knowledge can be developed and built up this way. Colleagues can share their education materials, support each other and evolve into a professional community.



E-learning frameworks are well developed in many higher educational institutions all over the world. Lecturers upload lessons with many links to reading materials, and they can formulate requirements and manage examinations. This is the kind of framework is typically an 'e-learning 1.0' product – a virtual model of institutionalized education. Rigid, teacher and content focused, participants are not expected to contribute in the system. They may be only passive consumers of knowledge-based content.

In mixed systems, students can download educational contents saved on central servers to their own computers and use them without a network connection. While students are working on their own computers, data (such as test results for instance) is stored locally and when they re-connect to the network, data is uploaded to the central database (the system synchronizes local and network databases at each connection). Microsoft's training courses operate in such a mixed system – for example the Microsoft Certified Partner program. In this example, the student is provided with a large quantity of training lessons, and the online examinations are organized (in a given country) at special, accredited examination centers.

PARTICIPANTS AND TASKS

Tasks supported in platforms are divided between the LMS and the LCMS. What visitors to and participants in a course can actually see and what options (rights) services they can access depends on what roles and authorizations they have. Administrators have the highest position and authorization, while visitors have the lowest. The distribution of authorities is the responsibility of system administrator, but the entrance procedure and the access are supported by the platform (LMS).

The LMS exempts tutors from certain administration work. They do not have to record absence, for example, and do not have to correct tests performed by students. All these are done automatically.

In Tenegen, the authors of e-learning content are called instructors. Teachers who help and supervise students are tutors. These new titles reflect the non-traditional roles they have to fulfill. For example, instructors plan student activities and they are responsible for the professional relevance and validity of the course content.

It does not matter whether we talk about distance learning or full-time courses, the role of teachers (the tutor) is crucial. Before thinking of ICT as some kind of network technology that reduces the work of teachers, consider what kind of tasks they have in an online course:

- learning objectives must be considered, syllabuses and exercises must be planned according to the goals,
- lessons, exercises and tests must be prepared and uploaded in advance,
- student activities must be planned and organized in the given LMS,
- constant presence is required! Student activities must be followed up and evaluated individually. For every little action there must be some reaction (otherwise motivation is lost).

In this kind of environment it is possible for the tutor to have to support each student individually. This is not normally possible in a real-space classroom. However, such activity can take a tremendous amount of time!

It has proved a real challenge to find a business model which supports such a level of activity. Who will pay for such support?

COMMUNICATION AND COOPERATION

In contrast to offline solutions, the great advantage of e-learning frameworks on the Internet is that there is the potential for communication and cooperation amongst participants. The "classic" communication opportunities are:

- e-mailing,
- chatting,
- forum and
- video conference.

This list will rapidly become longer as web technology (web 2.0 and the future semantic web) develops. The development of framework systems began in the 90s. First solutions are often criticized because they do not do anything but preserve the bad practices of traditional teaching within a modern technological environment. Such solutions have not become, or allowed to become, obsolete because as long as institutions based on today's system survive, the functions which support will also survive. On the other hand, and more importantly, modern frameworks are much more open than earlier ones. They tend to support cooperation and try to integrate the latest tools from web 2.0 technology. Moodle is an example of a web2.0 aware platform.

THE CHARACTERISTICS THAT AN E-LEARNING 2.0 SYSTEM EXHIBIT ARE AS FOLLOWS:

Openness:

1. Learning environments should not create a closed 'isolated system'. They should be open to, and interoperable with, other systems and solutions.

Participation:

2. Teachers and students should cooperate in the development of the environment. Students should have the option to integrate external tools used by them. Teachers and students should work on the same platform with the same tools. Students should get the opportunity to create and share new lessons.

3. Participants should be able to tag their own contents freely. They should be able to develop their own taxonomy reflecting those parts of lessons which interest them most.

Motivation:

4. Learning environments should support participative activity in a user-friendly manner.

5. Learning environments should support developing communities, and should provide options for participants to get to know each other.

6. Teachers should be present in the learning environment. In addition to creating study materials they should emphasize organizing conversations and exchanging experiences

Tracking, evaluations, feed back:

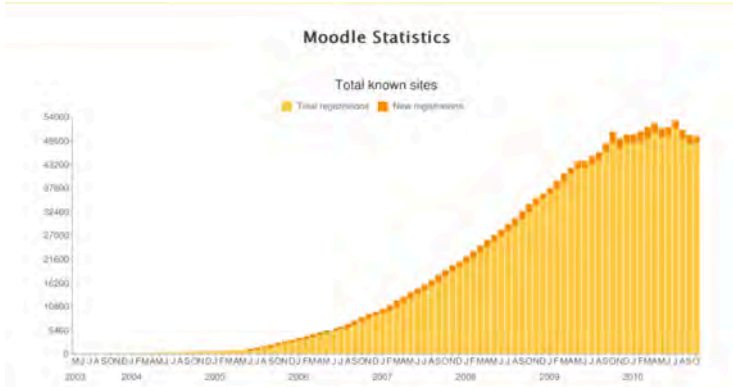
7. Teachers/Administrators should have the functionality to track the learning of individual participants.

8. Teachers/Administrators should provide options for feed back.

9. E-learning systems should provide functionality participants to reflect on their learning.

10. Learners should have the option to express their opinions about the content offered.

The golden age of e-learning systems (the LMS and LCMS type systems) lasted from the early 90s until the Web 2.0 tools started to appear. Many people predict that the age of strictly teacher centric 'virtual schools' may be over. In fact more and more educational institutions now create their own e-learning systems. Moodle is a good example of this type of framework being used, with more than 49,000 validated sites in more than 211 countries (http://moodle.org/stats) in 2010. While in the 90s development tended to represent a huge amount of capital finance for institutions, in the era of 2.0 capital cost-free solutions are becoming commonplace. It appears that many institutions are adopting systems which tend to incorporate e-learning 2.0 systems.



We perform regular bulk checking of sites to make sure they still exist, so occasionally you may see reductions in the count

Registered sites	49,605
Countries	211
Courses	3,918,097
Users	38,161,097
Teachers	1,122,771
Enrolments	17,853,434
Forum posts	64,453,135
Resources	34,326,755
Quiz questions	59,903,896

Source: moodle.org (accessed: 25. November, 2010.)

CHAPTER 4: E-LEARNING THE SCHOOL OF FUTURE

This picture on the left looks very depressing, especially for those who spent happy days in similar looking classrooms, sat at old desks like these. However maintaining the traditional ways of teaching is becoming more and more difficult.

The information society is a carrier of a new social tension: the gap between those who can get economic positions, and those who cannot, grows wider. A digital gap can be created between the different social classes of a nation (when poor people or certain minorities fall behind) or between different economies.

In the development, or in the prevention, of a web culture, computer and Internet supply plays a prominent role, but it is not just a technological matter.

No wonder that those who have experiences from traditional educational institutions are skeptical of many issues relating to this new pedagogic era. There can be no doubt that the way knowledge is acquired in the 21st century is changing rapidly. School age pupils read fewer books than previous generations and when they need to look up something quickly, they will tend first of all to browse the World Wide Web, rather than a reference book .

It appears that teachers feel that there are many drivers and barriers to the adoption of computers, the Internet, e-learning and multimedia into the teaching system. Some are shown on the picture.

The opinions can all be readily justified, and are true in very many situations. Teachers, schools, and parents in the 21st century are all faced with new challenges. Teachers not only have to face up to these drivers and barriers, but they must also support students and parents in coming to terms with these drivers and barriers.

Among young people there are now many computer addicts. This is perhaps due to the fact that children use computers in a way that designers did not expect. However many claim that computers

- adapt users to superficiality (there is no need for thinking, only for trial and error),
- make users conceited (I can use it but my parents cannot),
- generate aggressiveness; (rude games and the uncontrolled use of games).

The Hungarian psychologist Attila Krajcsi (2000) collects “the old troubles of the Internet” as he calls them, and claims that

“the often cited harmful mechanism that are considered to be the threats presented by the Internet are not all related to the net but rather to old dangers which existed before and resurfaced in the Internet era”.

See some examples of this:

- **The question of reliability**: you cannot know who is at the other end of the communication channel.
- **Authenticity**: to what extent can we trust the information from the Internet?
- The loss of sense of reality: those spending too much time online, lose contact with reality.
- **Alienation**: those addicted to the computer gradually lose their relationships with other people.
- **There is a loss of identity**: you can become whoever or whatever you want on the Internet as a result of which you yourself no longer know who you actually are.
- **Aggression**: computer games are alien to human life and make their users violent.
- **The appearance of extremes**: pornography and pedophilia; the Internet is the favorite gathering point for men of unnatural inclinations and extremist beliefs.
- **Communication becomes impoverished**: the potentials of the new means of interaction result in the loss of vibrant communicative practices so that language becomes stunted.
- **Data smog:** the abundance of information overwhelms the users since there is no of finding one's way through the mass of data.

"*However, there is nothing mystical about the Internet. It is exactly the same as the world that surrounds it, a claim that can be easily justified since the world is also violent, certain people are evil, and sexuality appears considerably in our every day life as well. The world is reflected in the contents of the Internet and its usage...We should not disregard the fact that there is nothing else on the Internet, but uploaded content that had existed in the real world beforehand, it is nothing less, nothing more.*" (A. Krajcsi, 2000)

Children can be immersed in the use of computers; developing personalities which exist only online, spending many hours in single user and multi-user games. **But what do many teachers and parents know about computer games, and immersive environments? How does computer-based gaming affect our children? Are there any good effects from playing computer games?** Parents buy computers because they feel they should provide their children what they think they need.

The ideal position is where computers and Internet are more than just for amusement for students and additional work for teachers. To get to this position, e-learning has to become a more efficient and more realistic tool for everyday teaching. There is also a need for more learning opportunities for teachers and in the development of new methods of teaching and learning.

IT infrastructure in domestic educational institutions has significantly improved over the past few years. However, a survey from 2006 about the "application of e-learning syllabuses for vocational training" shows that most secondary schools were only able to create proper computerized classrooms to teach information technology itself. Usually there are few options for teaching traditional subjects in computerized classrooms. There is still a need for further improvements in this area.

Is e-learning really the future of the school?

The development of networks and the Internet, and the numerous new tools, have started a new age in learning. It has become clear that not only must new learning concepts be defined but everything that we know about pedagogy, methodology, schools, students, and teachers, must be reconsidered and rebuilt if necessary.

Of course, it is impossible to digitize those centuries' old, very reputable systems of learning overnight. Would we want to? The web has taught us not to design a command economy model for anything, especially social activities such as teaching and learning.

But can we afford to ignore the possibilities offered by the information age? Is it possible that teachers can keep control in the digital world without the knowledge and resources that the web provides?

E-learning does not simply mean that all the material that was available in books will be uploaded to the Internet. The establishment of networks and the Internet, the multitude of new communication tools mark the beginning of a new era and it is becoming obvious that our task is not simply to define a concept but to rethink and rebuild everything that we have experienced or learned about pedagogy, methodology, school, students and teachers. The system of conveying knowledge, which has been established throughout centuries, cannot be "digitalized" in an instant. BUT: we make a mistake if we do not exploit the opportunities offered by the information age.

CHAPTER 5: LEARNING MANAGEMENT SYSTEMS

There are a large number of framework solutions available for implementing electronic learning environments.

Multinational IT companies (for example Microsoft, Cisco, IBM, SAP and Oracle) provide e-learning solutions of various complexities. There are also specialized providers of e-learning solutions. These specialized providers can be either multinational suppliers or national suppliers. The national suppliers tend to exploit local differences in the learning landscape. Most of these private suppliers of solutions tend to be closed, in the sense that the solution is designed to fit the complete needs of an organization.

There are also new entrants to the market coming from the open source community. These solutions tend to come from publicly funded projects, or from academic research activity.

There is an obvious and large difference between the design of Open source solutions and proprietary solutions. The open source solutions tend to be developed by a network or community of developer across the web. Proprietary solutions tend to be developed by a single laboratory, looking after the needs of the owners.

Whatever technology is implemented by an organization, there are always costs to be paid. These costs include licenses, installation and maintenance, and the payroll costs of all of the people working on the platform.

Today, the level of professionalism exhibited by both open source and proprietary solutions are comparable. There are a multitude of suppliers of e-learning tools, platforms, and services. The magazine e.learning age lists 27 suppliers of LCMS and 150 suppliers of LMS solutions at http://www.elearningage.co.uk

Sulinet Digital Learning Base

The Hungarian organization, Sulinet, won a Comenius-Edumedia-Award in 2007. This is awarded by the Society for Pedagogy and Information (GPI), a scientific society for multimedia, educational technology and media didactics, for outstanding products in the field of ICT-supported educational media. The honor was received in Berlin by the representatives the Hungarian Education Community Service Public Company and Sulinet Program Office. The SDT Digital Learning Database is a repository of digital learning materials. In the SDT teachers and students of general secondary and vocational schools find many thousands of digital learning materials, and teachers are invited to collaborate, and to extend the database with their own digital educational products.

SDT can be used free of charge. Currently it contains more than 11 000 (mainly secondary school) general and vocational lessons and lesson supplements. www.sulinet.hu/tart/kat/Se (accessed 01/04/2010).

Moodle

Moodle was initially designed and distributed by Martin Dougiamas in 1999. Dougiamas is an Australian developer and scientific researcher. It is released as an open source-code system providing learning and content management. The aim of Moodle was to develop a new system which, contrary to first generation framework systems, supports cooperation between teachers and students. It is very interesting to examine how this application has become so widespread in so short a time. It could be that this is a result of its excellent technical features:

- requires little power resources,
- available in several languages,
- only a browser is needed for the application,
- supports international standards (SCORM, IMS, etc.),
- it has serious innovative support,
- installation is very simple,
- it can be connected to outside databases on data level,
- well documented (in foreign languages too),
- supports web 2.0 services (chatting, forum, blog, Wikipedia). More and more institutes have joined the community of Moodle users.

ILIAS

ILIAS is a web based e-learning framework system to support learning materials and it providing both LMS and LCMS service. It is being developed with the coordination of the University of Köln (based on PHP, MySQL). Since September 2000 it has been distributed as open source-code software. It is worth checking it application statistics. The sourceforge (www.sourceforge.org) statistics are here - www.ohloh.net/p/ilias?ref=WidgetProjectThinBadge. (accessed 01/04/2010). There are 95 logged downloads for ILIAS. Ilias also has statistics at www.ilias.de/docu/goto_docu_lm_470.html (accessed 01/04/2010).

Blackboard

The first version of e-learning products was branded Blackboard CourseInfo LLC in 2000. Blackboard went public in June 2004. Blackboard software is used by over 3,700 education institutions in more than 60 countries, and is the selection of choice by system administrators. This is proprietary software, and has significant capital costs associated with it.

CHAPTER 6: STANDARDS

Industrial standards are used to determine products used in all parts of our life – from a simple bathroom faucet all the way to complex computer networks. These standards allow us to know how to implement and use products; they also define how they can interoperate. So a bathroom faucet will have to connect to a plumbing system, and a computer workstation will have to connect to a digital data network. Obviously, the extensive application of digital formats would not be possible without world-wide conventions – standards. Electronic courses are made up from of digitally stored assets such as audio, video, picture and animation data – which should all be held in a standard format. There are a multitude of possible data structures for such data assets. Designers and developers have to follow international standards and protocols to ensure valid and compliant computerized environments.

STANDARDS IN E-LEARNING

One of the general purposes of standardizations is the saving of resource. The same is true in case of e-learning. One of the central issues of e-learning standards is based on the concept of "learning object". A learning object is a resource, usually digital and web-based, that can be used and re-used to support learning. (http://en.wikipedia.org/wiki/Learning_object accessed 01/04/2010.)

There are advantages to dividing digital content into elemental parts (concepts, exercises, illustrations, etc.), to identifying the units unambiguously (as books are in library catalogues) and to storing them in digital databases with their descriptive attributes, such as:

- Enabling browsing or searching at any time,
- Supporting reuse for other lessons, creating customized lessons to meet different needs
- Utilizing the elements in different environments or frameworks.

LEARNING OBJECTS

The concept of "learning object" - developed as a result of methodological researches - has a prominent role in the e-learning terminology.

Learning Object (LO) – in terms of methodology and didactics is the basic unit of lessons which cannot be further divided. It can be handled individually and has its individual meaning. Occasionally it can be utilized in more subjects for more topics (and can be resembled mostly as an entry of a digital lexicon). Examples: graphics, pictures, animations, video clips, exams, definitions, concept definitions, exercises, formulas, etc.

The development of this concept was encouraged by three basic needs:

- the need to reduce the costs of e-learning developments,
- the need to access and discover digitally stored assets,
- the need to identify e-learning products for protecting copyrights.

LEARNING OBJECT METADATA – LOM

One does not need a lot of experience in the world of digital assets in order to understand that computers cannot search the contents of a picture or digitized voice.

If a digitally stored picture has to be found on the Internet some description of its contents must be given. When you are searching for a painting in a database, you have chance to be successful only if the name of the artist, the title of the painting or the date of painting, etc. are stored together with the digitalized version of the painting. The "title of the painting" and the "name of the artist" are examples of metadata – data about the data.

E-learning solutions use the idea of "learning object metadata". This approach fulfills (or may fulfill) the following requirements:

- Reusability – LOs developed for one situation, together with descriptive metadata, can be stored in one database. Such LOs can be discovered later and reused in another situation. Thus we can reuse LOs for the benefit of new lessons.
- Flexibility – with the help of Los, suitable lessons can be created for a given target group.
- Uniformity – when creating LOs, standards have to be applied in order to be able to organize them in a simple way for many e-learning platforms.
- Simple refreshing – when needed; old, out-dated objects can be simply changed without rewriting the whole lesson.
- Economy –reusability reduces the costs of producing learning content.

In the picture, above, you see metadata for a learning object published by a teacher in an on-line repository – used in the US as a market place where teachers can share their works with each-other. On this site teachers from all over the world offer their assets, as well as their tools, and even complete lessons. There is opportunity for selecting, evaluating, and downloading digital content free or for money.

STANDARD ORGANIZATIONS

Aviation Industry CBT Committee (AICC)

AICC (see www.aicc.org) is an organization for companies applying computer supported educational methods. It was established in 1998. It develops recommendations and standards to the development and mediation of computer based education packages. Standards are not exclusively used in aviation industry but worldwide in other industries too. AICC has become a de jure standard.

Instructional Management Systems (IMS)

The IMS is an Association which supports the development of standards, innovation, best practice and recognition of superior learning impact, in the field of e-learning. This standard has been established and maintained by IMS Global Learning Consortium – an international nonprofit organization, whereto anyone can join freely (www.imsglobal.org). The IMS standard is mostly used on the following areas:

- tests, examinations,
- content management,
- metadata,
- student information,
- company information (learning methodology, access regulation, etc.).

IEEE Learning Technology Standards Committee (LTSC)

The Institute of Electrical and Electronics Engineers is a non-profit alliance with several thousand members being active mainly in different technical fields. Among many other things it is also being the developer major standards of computer network communication. Its professional committee specialized on e-learning systems called IEEE LTSC (Learning Technology Standards Committee - www.ieeeltsc.org), with 20 work teams. The committee designated the following areas of e-learning framework systems for standardization:

- General – structure, reference model, concept lexicon
- Student related services (student identification, student profiles, evaluation of student activities)
- Content related services – storing, compressing, organizing, and maintaining syllabuses.
- Data and metadata – storage structure, systematization, etc.
- Complementary applications –software environments

Advanced Distributed Learning (www.adlnet.gov)

The ADL (Advanced Distributed Learning) organization was established by the United States Ministry of Defense and the White House Office of Science and Technology Policy in 1997.

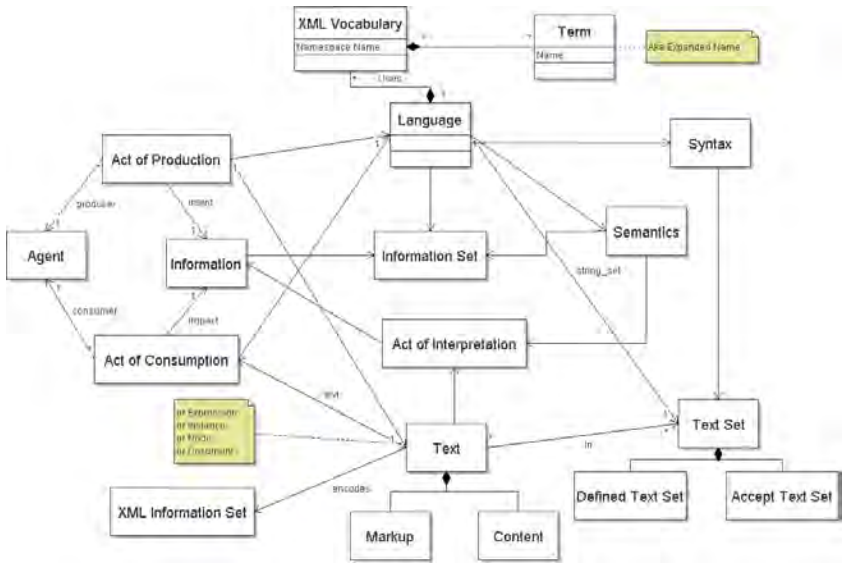
Sharable Content Object Reference Model - SCORM

According to ADL their target was to provide the highest level of electronic education that could truly serve the custom needs of clients. The SCORM standard was prepared with the aim of being the structural model for web based content, and it tries to unify the results of the IEEE LTSC and IMS standards, concentrating on the criteria of reusability.

THE STANDARDS PROCESS

As the e-learning market grows, the quantity of learning materials available online has soared. So too has the number of tools for content creation, content delivery and applications for content management. Common standards for metadata, learning objects, and learning architecture are mandatory to ensure success of the e-learning. Fortunately, the work to create such standards for learning objects and related standards has been going on around the world for the past few years. This includes the creation of accredited standards from the IEEE Learning Technology Standards Committee (LTSC) for Learning Object Metadata, Computer Managed Instruction, Course Sequencing, Learner Profiles and much more. The process of developing standards includes work form all of the organizations noted above, and can be shown in the diagram below:

All of these standards are built on the W3C XML standard (and hence the ISO SGML standard), which is the building blocks of the web itself. The HTML instance of XML shows the value of using standards, and many organizations believe that simply using XML itself is standard enough, i.e. using standards for content, not just its packaging or description.



CHAPTER 7: MULTIMEDIA

Multimedia (i.e. several media) conveys a message through several channels at the same time and is able to integrate several media (texts, audio elements, pictures, videos, animations) into one communication system.

Methods of digitizing text are as old as PCs but analog-digital conversion has not been easy, even since the wide-spread use of personal computers. The technological novelty of the first Multimedia PCs (at the beginning of the 1990s) was their ability to display analog films onto a monitor operating under the control of digital technology. We define a computer system as a multimedia system since when it is able to integrate at least one discreet (time-independent) and one continuous (time-dependent) medium.

The widespread use of multimedia dates back to the beginning of the 1990s when the capacity and speed of personal computers supported the storing, transmission and playing of memory hungry media elements (pictures, audio materials, videos). 1992 was an important year in the history of multimedia, as the introduction of the World Wide Web made the use of multimedia elements a near necessity.

In this age of technological convergence, analog technology was largely discarded in favor of digital solutions. In parallel there are now more and more devices - like mobile phones - that are multimedia capable. In the 90s a multimedia PC was considered a curiosity. By 2009 all personal computers and laptops were able to play multimedia presentations without the need for special IT support to create presentations or to transmit multimedia messages (that is, messages containing videos, text, pictures, music or human voices) over the Internet.

The development of communication tools based on computer technology, - technological convergence – has significantly speeded up the spread of multimedia, and the areas of application are becoming ever broader. Multimedia provides interactive information in museums, satellite positioning and navigation systems (GPS), surveillance camera systems in streets, and digital televisions – which will replace traditional televisions within a few years – which can be regarded as a multimedia. The next generation will see us borrow books from a multimedia “world library”, and watching digital TV -- though the actual appliance will not necessarily be a TV as we know it.

Virtual reality is a special field of multimedia developments which is no longer restricted only to the entertainment industry. It is spreading in every field of science and arts.

Multimedia and the Internet fundamentally have changed our understanding about human communication and about the ways of creating and distributing knowledge - and at same time it has had a significant impact on how we now think about about learning and teaching.

MULTIMEDIA IN EDUCATION

One of the key quoted features of multimedia is that it: *conveys a message through several channels at a time using information aimed at several sense organs (though listening and seeing, for example) simultaneously*.

Research has shown that if we use several organs of perception at the same time, we are able to process more "data" per unit time so the intensity of learning through multimedia can improve. On average men are able to remember 20% of information heard, 30% of information seen and 50% of information simultaneously heard and seen, but the best result (80%) can be achieved if we see, hear and need to "act" during a lesson.

Educational multimedia - multimedia software – offers instructional designers a range of opportunities to involve the learner intensively with the learning process, including the potential of choosing a personal learning path. It is individual vision and ability that limits the range of possible integrated interactions, including quizzes, problem solving activities, special simulations and animations, etc. All should, however, also require action of the part of the learners. The terms 'interactivity' originated from computer technology, referring to human-computer communication through the specific user interfaces and interactions with software systems. The terms has a special, extended meaning related to educational multimedia because interactivity - shifting the learner's role from observer to participant - is a dominant factor in the improvement of the effectiveness of the learning process.

In spite of the overhyped expectations of e-learning developments in the 90s - focused mainly on educational multimedia - the expected impacts have not been realized: e-learning based on multimedia solutions has not been able to revolutionize education. The educational world is now over this first period of euphoria, and over the 'e-learning hype', but many teachers are now skeptical of the real demand for educational multimedia, and about its effectiveness for improving learning processes in schools. Multimedia CD development -- heavily promoted in the 1990s – did not manage to integrate e-learning methods into the pedagogical practices of schools, even in front-runner countries.

WHAT IS THE PROBLEM WITH THE MULTIMEDIA?

In a Hungarian comparative study (Nádasi, 1999) the efficiency of different media in learning produced results worth noting:

˝1. Neither the audio-visual or electronic media was proven to be significantly better than the other in terms of efficiency of learning/teaching. (Not every medium can be used for all instructional objectives, and to reach a goal several media can be used with different effectiveness.)

2. Each ICT tool carries a specific (additional) potential in transferring information and developing skills, and it establishes and requires special learning environment. (Beside the essential features of the medium the technical parameters plays important rules too.)

3. The efficiency of information processing depends to a great extent on how much the content and structure of the curriculum is in harmony with the specific features of the delivery medium. (Not every structure can be mapped with every medium on an adequate way.)

4. When selecting the delivery medium from an efficiency viewpoint, it is essential to consider the learner's age, abilities and cognitive level, as well as the way a teacher uses the given tools. (The manifold presentation, the deepness of the details as well and the possibility of repetitions give chance for the differentiation.)

5. The methods how the media are used by the teachers, the planning of each medium and the whole process are crucial regarding the results of the teaching. (A medium - perfectly developed applying system-approach - which has already proven to be effective, can be used inefficient, pointless.)˝

According to a Hungarian survey Radnóti, K.: only 54% of Hungarian teachers think that it is worth integrating multimedia into lessons; 21% think it may be useful at times, and 20% of teachers said there was no justification at all to use multimedia in education. Why is this? Are there specific problems with educational multimedia?

Pro

"Multimedia will provoke radical changes in the teaching during the coming decides, particularly as smart students discover they can go beyond the limits of traditional teaching methods. Indeed, in some instances teachers may become more like guides and mentors along the learning path, not the primary providers of information and understanding - the students, not teachers, become the core of teaching and learning process. This is a sensitive, highly-politicized subject among educators, so educational software is often positioned as "enriching" the learning process, not as a potential substitute for traditional teacher-based methods." (Tay Vaughan, 1994)

Contra

"After an initial period of enthusiasm, often described as 'hype', there are growing doubts about the real demand for educational e-content, and about its relevance for improving learning" (European Commission, 2002). "Learning is based on motivation, and without teachers that motivation would cease to exist. (Oblinger & Oblinger, 2005, among others) "Despite the considerable efforts undertaken, the e-learning sector is still fragmented and there are many open questions on how to exploit the potential of ICT in education and training. A broad partnership between the various stakeholders of industry, education and training, public sector and civil society is needed for Europe to reap the full benefits of ICT and learning in the knowledge society." (A review of studies of ICT impact on schools in Europe, European Schoolnet, 2006)

Pro

"Open-endedness and flexible combinations of text, graphics, video and audio therefore are the key stepping stones to enabling e-learning design to become easier. Designers need to be the creators envisioned by Weizenbaum in the early 1980s, exploring with curiosity and supported by multidimensional ways of working with information." (B. Holmes and J. Gardner 2006)

Contra

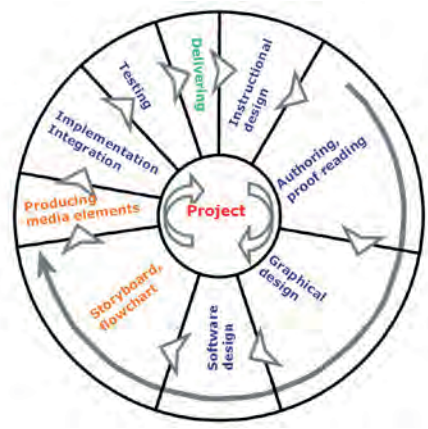
"Obviously it is easier for a student to understand the conformation of ciklohexane in the chemistry lesson if it is presented in 3D format. However, by doing this we might as well remove one small "brick" from the student's development instead of "building" and promoting understanding. Instead of trying to imagine and understand the position of the binding angles in space, the student sits and waits for feeding his brain with an easily understandable pulp. If the student's space perception does not develop and the ability to imagine the position of atoms in space regresses, his chances are considerably reduced to be able to imagine the structure of a crystal lattice (just to take another example from chemistry in order to draw your attention to the problem). Naturally students can survive by using several mass-produced mental "crutches" and artificial legs until the end of their high school studies, but this way of learning and teaching cannot be considered normal…" (G. Hanczár, 2007)

Pedagogical and psychological approaches are given special emphasis in the development of educational multimedia. Multimedia software should also pay particular attention to ergonomic requirements. It is relatively simple to determine whether particular material deserves to be classified as "educational multimedia": if it does not utilize opportunities offered by modern technology in order to promote understanding, the object is merely an example of simple demonstration tools.

This poses the question: **how difficult is it to meet learning expectations for educational multimedia?**

DEVELOPMENT OF EDUCATIONAL MULTIMEDIA - WHAT DOES IT MEAN?

Proper development of multimedia needs the collaboration of several experts within a well-managed project framework. Depending on the pedagogical aims, the project's size and the subject, the project work is generally a team effort that may require the participation of instructional designers, content developers, editors, multimedia designers (graphic designers, animators), interface designers, video producers (camcorders, film editors), musicians, audio engineers and software engineers. So the development may require experience of producing traditional textbooks, but could also require the craft of the motion picture industry and the software industry. The main stages of an average multimedia project are:



- planning and costing,
- designing and producing,
- testing,
- delivery.

Similarly to the production of a film, in the design phase creative plans, manuscripts, and storyboards should be prepared. The media elements (pictures, graphics, music, sound effects, narratives, video clips should be produced, with a high quality. When integrated, the resulting system – which may be quite complex – should be an interactive presentation with high visual and semantic consistency.

"Now computers can be television-like, book-like and 'like themselves'. Today's commercial trends in educational and home markets are to make them as television-like as possible. ***And the weight of the billions of dollars behind these efforts is likely to be overwhelming.*** *It is sobering to realize that in 1600, 150 years after the invention of the printing press, the top two bestsellers in the British Isles were the Bible and astrology books! Scientific and political ways of thinking were just starting to be invented. The real revolutions take a very long time to appear, because as McLuhan noted, the initial content and values in a new medium are always taken from old media." (Alan Kay, 1996.)*

To answer the question posed at the start, some of the problems can be explained by the fact that in early developments the concept of ‚multimedia' was not thoroughly elaborated, particularly as the complexity of the theme was greater than first thought.
There is no doubt that educational multimedia -- with attractive, visually consistent animation, simulation games, with pedagogically validated interactivity -- will play an important role among the toolkits that teachers will use in this information era, but there is a need to be aware of some facts:

- development is very expensive,
- that low quality multimedia can do more harm than good,
- not all teaching subjects are suitable for presentation as a multimedia.

In this 'e-learning 2.0' period we are over the misconception that only educational multimedia can provide relevant pedagogical tools that meet the expectations of the information society, and hence that we should develop all learning content in the form of multimedia animation and simulations. While web 2.0 tools for networked learning and online collaborations are coming to the fore, multimedia remains important, but not as the 'king' of the e-learning space, but as one of the educational tools which can be applied in relevant situations by teachers.

"This new kind of "dynamic media" is possible to make today, but very hard and expensive. Yet it is the kind of investment that a whole country should be able to understand and make. I still don't think it is a real substitute for growing up in a culture that loves learning and thinking. But in such a culture, such new media would allow everyone to go much deeper, in more directions, and experience more ways to think about the world than is possible with the best books today. Without such a culture, such media are likely to be absolutely necessary to stave off the fast-approaching next Dark Ages." (Alan Kay, 1996.)

THE ROLE OF TEACHERS IN DEVELOPMENT

As we have seen the roles within multimedia development generally involve professionals from the motion picture industry, from the software industries, and from other creative areas. Multimedia development is not a personal venture (albeit Leonardo da Vinci was scientist, architect, creative designer and poet folded into one!).

However educational multimedia cannot be successful without the experience of teachers. **Teachers should be present in the developments, as instructional designer, author, pedagogical or methodological experts.**

In e-learning 2.0 the focus has moved to applications for sharing small electronic educational resources - learning objects - prepared for special pedagogical aims. Learning Objects can be published and shared through the social networks, and among the self organized online social communities of teachers. Web 2.0 tools offer a very different paradigm to that of the large multimedia systems with their complicated publication development paths. Now teachers can construct valuable repositories, storing a large numbers of small educational elements and offering opportunities for teachers students an outlet for their creativity.

Question

Do you have creative students who are experienced in creating digital pictures, editing videos and digital sounds? If yes, would you (could you) involve him or her in your development? What do you think about the future: could members of the net generation ever take part in the teachers' pedagogical work as creative partners?

CHAPTER 8: MULTIMEDIA IN THE COMMUNICATION

HYPERTEXT, HYPERMEDIA, MULTIMEDIA

The three concepts listed in the title are interrelated; trying to define one of them will inevitably lead to the seco–nd or the third one.

Social scientists rely on written materials, so it is easy to understand their excitement over the features that text on the World Wide Web can have. There is the possibility of following innumerable links which lead in various directions and to many mental adventures, are seemingly infinite expandable and able to be searched, edited, and modified. Ever since the Internet opened up and made available for higher education institutions, many analyses have been published predicting fundamental changes in the history of human communication.

Though first advocated over 60 years ago, the newly exploited concept of *hypertext* is one of the mainstays of the technology and offers a new paradigm in the organization of content.

Hypertext is about electronically stored documents interconnected through nodes, or links. Texts can be extended through linking without obvious limit, and can be found, studied and read by following the linkages. When reading a text, it is easy to follow new text 'nodes', offering new branches, by uniquely identifying the next document in the chain. The identifiers used in the nodes are called "hyperlinks" or simply links.

"Electronic linking shifts the boundaries between one text and another as well as between the author and the reader and between the teacher and the student. It also has radical effects on our experience of author, text, and work, redefining each. Its effects are so basic, so radical, that it reveals that many of our most cherished, most commonplace, ideas and attitudes toward literature and literary production turn out to be the result of that particular form of information technology and technology of cultural memory that has provided the setting for them. This technology - that of the printed book and its close relations, which include the typed or printed page - engenders certain notions of authorial property, authorial uniqueness, and a physically isolated text that hypertext makes untenable." (Georg P. Landow, 1991)

Hypertext does not force the reader to follow a strictly linear route. Any path can be followed by clicking on a link in the text, and it allows for a relatively easy return to the original text itself. In the confines of a single document, we often do this when we read a footnote or follow a reference to the back of the book. We also do similar when we pick up a completely different book referenced by the one we started to read. The only difference is that in the case of real we have to physically find it on the shelves of the library.

Hypermedia is an extension of the concept of hypertext. In addition to text (text documents), different kinds of media elements -- pictures, audio recordings or videos -- can be found in the referenced nodes. Hypermedia started to take off at roughly the same time as the World Wide Web which was also when hardware limits on the forwarding and presentation of media elements eased. Hypermedia is now becoming dominant on the Internet.

„Hypermedia is a holistic world and knowledge model, for it intends to include theoretically everything, the "whole", and everything is inevitably related to everything. Specialization, which used to save the life of civilization, has become life-threatening, because the parts do not communicate with each other and we forget to think about the consequences. The storing capacity and the operation speed of computers allow us to approach the world in a complex, universal way again." (Sugár J., 1996)

Did multimedia or hypermedia come first? Hypermedia was certainly postulated before multimedia; however, multimedia CDs came into existence before real *hypermedia*. This was soon followed by *hypertext* on the then largely text-based Internet. Now the use of *hypermedia* on the World Wide Web -- based on multimedia elements -- is firmly established. Multimedia can be considered to be a set of medium established for conveying a particular message – for instance an electronic syllabus – with finitely many predetermined access routes. It is more definite than hypermedia in that is the development of established goals, but this fixed definition limits the potential of following unexpected and unanticipated routes.

THE HISTORY OF THE HYPERTEXT

Working with the first computerized word processors was not particularly easy. Even today we tend to need some instruction in the use of word processor software to write even the simplest of letters. However the potential to search electronically stored texts on the Internet is so great partly because of its simplicity for researchers, authors, philosophers, librarians, etc. No longer do they have to physically search through thousands of pages of books in a library.

The names *hypertext* and *hypermedia* were first used by Theodor Holmes Nelson -- the American philosopher and sociologist[1] -- in 1963 when he was thinking about designing a universal, computerized word processor. With the prefix "hyper" he intended to emphasize that this is a kind of electronically stored text having fundamentally different structure from the traditional ones.

He presented his thoughts in 1965 to the ACM (Association for Computing Machinery) conference about a word processor capable of supporting "non sequential" writing, and which could compare different versions of texts page by page, able to return to any of the previous versions. With the help of so called "connecting lists", any unit of a given text could be linked to a similar unit of another text, with a link created between each.

Nelson's idea was, in turn, a result of him having attended his teacher's (Vannevar Bush) presentation about a computerized document processing system called *Memex*. Vannevar Bush was working as the scientific advisor of President Roosevelt in 1945. In this duty he had to coordinate the work of many thousand scientists. By reading linearly printed texts he was unable to make progress at the rate that his work required. In 1945 (a few months before the handing over of the first computer, ENIAC, was announced at a news conference) he drew up in his now famous article showing that the just as the human mind is more *associative* than *linear,* there would be great advantage in creating create a machine that could support this information arrangement.

"The human mind does not work that way. It operates by association. With one item in its grasp, it snaps instantly to the next that is suggested by the association of thoughts, in accordance with some intricate web of trails carried by the cells of the brain. It has other characteristics, of course; trails that are not frequently followed are prone to fade, items are not fully permanent, and memory is transitory.

1 Ted Nelson's website: http://xanadu.com.au/ted/

Yet the speed of action, the intricacy of trails, the detail of mental pictures, is awe-inspiring beyond all else in nature. Man cannot hope fully to duplicate this mental process artificially, but he certainly ought to be able to learn from it. In minor ways he may even improve, for his records have relative permanency." The tool **MEMEX** imagined by Bush is referred today as the intellectual ancestor of hypertext, however the appearance of "non linear" text structure is dated back much earlier.[2]

Nelson's presentation in 1965 did not create much interest because he was unable to support his ideas properly from a technical point of view. Computer scientist pronounced his ideas a daydream. In spite of this Nelson looked for sponsors, partners (computer programmers) and established the "Xanadu" project. Over the next 20 years he with his workmates worked towards the realization of this dream. The technical solutions and underlying methods did not prove to be of value in 1988 they convinced the company Autodesk to support the project. The software was completely redesigned and programs were rewritten but deadlines slipped badly. In 1992, months from completion, Autodesk went bankrupt and financial support ended. Though he spent 29 years from 1965 to 1992 on the development, this was not enough for Nelson to prove that his idea could be fully realized, though he made many advances.

Meanwhile the English information technologist Tim Berners Lee (today the leader of World Wide Web Consortium) devised a simple plan for a World Wide Web of information, and presented it in 1989 to fellow physicists as CERN, in Geneva. His plans were accepted and as a result of the developments the World Wide Web (WWW) appeared in 1992. In 1993 CERN and MIT established the W3C consortium (Tim Berners Lee became its president) and shortly after the first graphic browser software -- MOSAIC -- was developed.

Ted Nelson did not like the WWW at all. In his criticism he pointed out that URL based identification is a much poorer solution than the one they had designed in XANDAU. XANDAU could have been able to identify all units, all letters, all picture fragments and the sound scraps of every document stored in the system, or on the 'net'. Perhaps it was this over ambition that held up progress?

FINALLY...

Marshall McLuhan (1911-1980), a Canadian literature historian categorizes technical mediums into generation. The first generation mediums are simple extensions of biological sense organs. The second generation can be connected to the appearance of alphabetic handwriting, while the third is connected to the printing of books. The foundation of the fourth generation medium is analogue signal transformation. This covers the development of the radio, the telephone and the camera. Finally, with digital technology came the improvement of electronics and the creation of computers, and hence the establishment of fifth generation mediums.

In his books published in 1962 (The Gutenberg Galaxy) he postulated relatively heretical ideas that caused great controversy. He dared to question whether the closest educating medium to human nature was the written text or the printed book.

2 „Selection by association, rather than by indexing, may yet be mechanized. One cannot hope thus to equal the speed and flexibility with which the mind follows an associative trail, but it should be possible to beat the mind decisively in regard to the permanence and clarity of the items resurrected from storage. **Consider a future device for individual use, which is a sort of mechanized private file and library. It needs a name, and to coin one at random, ``memex'' will do. A memex is a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory**." (Vannevar Bush: 1945)

His other revolutionary statement was that technical mediums have such a great effect on society that they can change the forms or habits of human production, consumption and contact. In this way they are able to fundamentally influence the means of social development. **"Medium is the message"** that reformulates the world.

McLuhan did not fully back up his opinions, as would be expected from a scientific work. However through his avant-garde ideas he nevertheless generated mass reaction from his contemporaries – both pro and contra. The resulting disputes about his thoughts are not over yet. Prior to his work, no one had dared to criticize the positive aspects of writing and **no one was thinking about how book printing had locked mankind into a visual world for centuries** (pushing other sense organs in the process of knowledge acquisition into the background.). He also postulated the "t**ypographic man**" who was trapped in an artificial system of signs for centuries.

How this is all related to multimedia? Real pedagogy is mostly concerned with necessary and inevitable paradigm change. Education researchers have determined that, at this time in their development, neither multimedia nor e-learning can meet the levels of educational expectations claimed. The last word here goes to the respected scientist, Georg P. Landow. Though he does not give any recipe for the future, he does comfort us with the fact that our ancestors were not any better at transforming education than we are.

"First of all, such transitions take a long time, certainly much longer than early studies of the shift from manuscript to print culture led one to expect. … According to Kernan, not until about 1700 did print technology "transform the more advanced countries of Europe from oral into print societies, reordering the entire social world, and restructuring rather than merely modifying letters". How long, then, will it take computing, specifically, computer hypertext to effect similar changes? How long, one wonders, will the change to electronic language take until it becomes culturally pervasive? And what byways, transient cultural accommodations, and the like will intervene and thereby create a more confusing, if culturally more interesting, picture?" (Georg P. Landow, 1992)

YouTube videos

Memex
Ted Nelson Mash-Up
The Invention of the World Wide Web

EVALUATION OF EDUCATIONAL MULTIMEDIA

A good rule of thumb for curriculum design is to aim at being idea-based, not media-based. Every good teacher has found this out. Media can sometimes support the learning of ideas, but often the best solutions are found by thinking about how the ideas could be taught with no supporting media at all. Using what children know, can do, and are often works best. After some good approaches have been found, then there might be some helpful media ideas as well. (Alan Kay, 1996)

It is not easy to devise a list of evaluation criteria to judge the quality of educational multimedia, but it is probably true to suggest that even if a particular solution meets all the technical requirements, it is not certain that it will also satisfy our pedagogical aims.

To determine the pedagogical value of educational multimedia may be as difficult as explaining why we like, or why we do not like, a painting. Some important points for evaluation are listed below, but this list contains only the "necessary" conditions, or requirements, which may not always be sufficient to help decide whether there is a proper application for multimedia or not. These are also minimum requirements, applicable to all educational multimedia.

An evaluation must take into consideration aspects of general educational content, which can actually be satisfied by textbooks or other more traditional materials used for educational aims. Multimedia goes well beyond this set of content, including user software which has to be examined for conformity and generality. There also has to be attention paid to the overall presentation, i.e. the consistency of media elements within the overall multimedia show.

Pedagogy, didactics, psychology

At a minimum an evaluation of electronic teaching material must consider the following.

- The structure and the actual content must comply with the set aims, it should be able to be adapted to the learner's individual learning style, and it should allow the learner to plan the overall learning activity independently (including making it possible to skip certain units).

- The material should attract and maintain the learner's interest, it should be interactive and should utilize the presentation opportunities of the computer without shifting the emphasis from the content to the way of presentation,

- The material should offer opportunities for practice, through examples, should opportunity for self-assessment, it should motivate by rewarding correct answers, and it should analyze and evaluate the learner's results at certain times.

Assessment criteria

- Does the teaching material meet the set of learning objectives?

- Does it fulfill the target group's expectations?

- Does it maintain the learner's interest in the material, i.e. is the principle of maintaining attention achieved?

- Is the principle of patient waiting/expectation achieved?

- Is the principle of confirmation achieved?

Ergonomic design

The ergonomics of human behavior, abilities, limits and other human characteristics should be taken into account when designing tools, machines, systems, work tasks, work environments in order to achieve efficient operation, and to provide a safe and convenient way of application. This is true also of multimedia. It should be simple to use, should ensure easy navigation, and the layout and the use of icons should be logical. The images and colours used should support and not hinder the handling of the material. The proportion of pictures and texts should be well-balanced and font sizes should be selected to make the text easy to read.

Assessment criteria

- image layout, general impression, originality of image design,
- user friendly (adjusted to the age group) work environment,
- the quality and systematic layout of the navigation elements,
- occurrence of errors,
- simplicity of the instructions to use (how memory consuming is it to learn),
- incidents of exhaustion, tension, frustration during usage (appropriate setting of action-reaction time, waiting time).

Media elements

Since media elements affect all the previously set requirements, it is practical to highlight the criteria governing their applications. A basic principle is that media elements and sound effects should be used moderately and only when justifiably used in electronic teaching materials.

- The length of the used video clips should be max. 1-1,5 min, and they should really contain extra information
- Animation should be used only in justified cases, and they should not be too fast
- Sound quality should be appropriate, the narrator's voice and speed of speech should be comfortable, and any text should be clear

Assessment criteria concerning media elements

Texts

• Simplicity
• Legibility
• Clear structure
• Conciseness
• Eye-friendly image

Symbols-logos

• Simplicity, clarity
• Aesthetic appearance
• Relevance to the symbolized object, phenomenon
• How much do they promote to highlight the main points

Audio materials

• Coherent integration (sg. relevant in the right place)
• Quality, integration of narration
• Originality, appropriate application of background music

Images

- Coherent integration (sg. relevant in the right place)
- Colours, colour combinations
- Quality of images
- Optimization (size, quality)
- Quality of figures

Videos

- Coherent integration (sg. relevant in the right place)
- Quality of the video clips
- Optimization (size, quality)

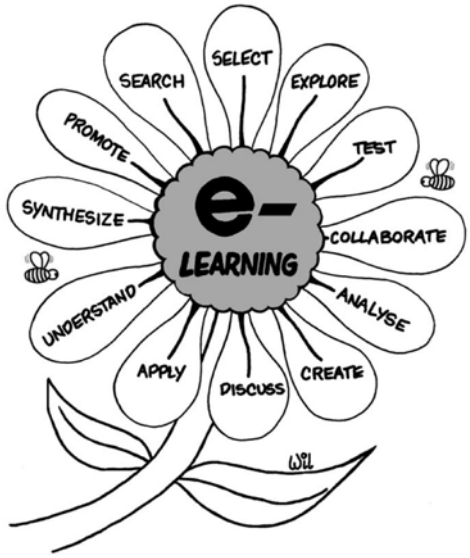
Animations

- Coherent integration (sg. relevant in the right place)
- Dynamism (quick, well-balanced, slow)
- Promoting understanding, drawing learner's attention
- Graphics

SUMMARY

Creating a textbook requires considerable technical expertise to compile comprehensive, high quality material. Using the right amount of high quality illustrations, selecting the right letter types etc. are all important considerations in the process. However, educational multimedia has to harmonize many more elements. In many cases the material may look really attractive, but the content that the information the creator intended to convey is lost, simply because the multimedia elements are not coordinated well and because emphasis is shifted to unimportant information.

CHAPTER 9: NEW MEDIA LITERACY



This flower was drawn by two Canadian researchers (B. Holmes, J. Gardner, 2006.). In this, they collect the competences which are needed to take advantage of the options for learning provided by the worldwide web. This is one model of competences – there are competing models. According to Holmes and Gardener, it will become difficult to imagine learning without cooperation on the net.

Key issues are:

- searching within online information,
- selecting the elements effectively for our needs among the huge amount of information saved on the www
- becoming productive members of some communities organized on the Internet and
- helping others to learn.

"E-learning requires different types of engagement, categorized in the framework of key practices or skills illustrated in the petals of the 'e-learning flower'."

The "e-learning petals" recall Bloom's taxonomy[1], but while the different competences have hierarchic structure in Bloom, the Canadian authors say activities related to e-learning are often done simultaneously or parallel and so competences develop, or can be developed, in parallel with each other.

Note: the radial nature of the 'flower petals' imply that there is no hierarchy within this framework. In any one instance, the practical activity undertaken by the learner may involve only one or perhaps several of the actions or skills denoted in the figure. While it might be possible to suggest levels of complexity to associate with the elements of this framework, it is likely that such a consideration will be irrelevant. It will be the actual context and the learner's needs and aspirations that will determine which practice or skill is appropriate. The competences identified are:

1 According to Bloom-taxonomy (Bloom, 1956) from realization through more complex levels of knowledge we get to the uppermost level, the evaluating level. According to the model, the hierarchic levels are:

- knowledge (repeating, definition, organization)
- comprehension (description, explanation, definition, realization, selection, translation)
- application (application, practice, presentation, illustration)
- analyzing (classification, comparison)
- synthesis (construction, production, planning, handling, organization, recommendation)
- evaluation (decision, support, value definition, evaluation, description)

• **search & select** - identifying the sources where the information can be found and then selecting the most relevant.

• **explore** - discovering information while browsing without any concrete aim that might match our interest or meet our needs.

• **test** - the online information might be published in special forms, such as simulations and games, giving an opportunity to the learner to try out the different cases. This interactive engagement offers them the possibility to interact, to change the conditions related to their study.
• **analyze and synthesize** - the learner should be able to analyze the different suggestions offered to solve certain problems, and than they should synthesize them to give an answer to specific questions.

• **collaborate and discuss** - the networking platform offers new ways for collaboration. The new generation - sitting in the today's classrooms - is always 'connected'. The potential of articulating ideas with others through the internet connections, and gathering reflections from others, has considerably increased learning options in recent years.

• **understand and apply** - based on collected information – through reading lessons, discussion, analysis and synthesis – the learner reaches a higher level in solving problems; he or she develops deeper understanding and an ability to apply this new skill in making decisions

• **create and promote** - e-learning offers new opportunities for learners; they can easily create their own content and share knowledge, through networks, in the form of digital learning objects. Using mechanisms for accessing, storing and retrieving the information they can benefit from the experiences and knowledge of others, hence fundamentally changing the learning process. Technical innovations can make it easier for the teachers to author and publish digital content, and to invite and to promote students to take part in collective creative work.

Similar ideas were developed in Hungary in 1997 (Bessenyei, 1997), although not with respect to learner competence analysis but with respect to the analysis of teacher competences. Dilemmas raised about the development of e-learning are enhanced given that more than a decade has passed since this article was published, and the questions raised then are still current.

"The widespread application of new information processing tools raises many different issues relating directly to teachers' education. Students majoring in schools will work in an environment where they must give answers to many practical problems."

- *How to process, maintain data?*
- *How to work with search engines?*
- *How to use computers' processing capacity for statistics? • What sort of education programs can be found on the net, and how are they found?*
- *How can a syllabus be created from information on the worldwide web?*
- *What conversation techniques can involve children's life experiences?*
- *How can cooperative learning be organized between network systems?*
- *How can interactive contacts be maintained with other schools, parents, local and*

central education management and what are the opportunities of network connections when being involved in local decision making processes? How can the potential that the students have more experience in the digital world than many of the teachers be utilized? How can their experience be utilized in terms of pedagogy? "(Bessenyei, 1997)

Questions:

Is this proposition timely? Are the competences detailed on the petals really important for your student to be successful in learning? Can you identify examples from your pedagogical practice aimed at improving the listed competences of your students? Do you agree with the

NEW TEACHING ROLES

The era of information society is not the first one when the importance of students' activity arose. Good teachers always knew exactly how important is not letting students be only the passive participants of lessons. According to the constructivist approach learning is creative process and its effectiveness depends on one hand on the personal talents of students and on the other hand on the environment. Knowledge is a result of social cooperation developed in interaction with the environment. Teachers are not responsible for giving new knowledge but for supporting student in "building up" their knowledge.

According to the objectivist approach knowledge and the abilities needed for solving a given problem can be exactly (objectively) determined. This precisely defined "knowledge pack" can be handed over to another persons as a finished product, who as a simple receiver, do not have to make any special activity or effort.

Teachers with objectivist approach:

- summarizes knowledge in his/her presentations (assembles knowledge packs);
- presents facts and logical coherences;
- illustrates how problems or tasks can be solved with the knowledge pack;
- gives practicing exercises and evaluates the results.

Teachers with constructivist approach:

- start with raising problems with examples and situations;
- help students find the solutions, have students "discover" the method;
- organize, complement and summarize thoughts upcoming during the solution process.

Teaching with objectivist approach is simpler from the teaching point of view and requires less investment but there is a high risk of providing unrealistic and less useful knowledge. Students enrolled from secondary schools to universities and not knowing how to calculate percentage (even with calculators) possibly have this kind of educational background.

Certainly constructivist teaching cannot be applied always in every situation. In some cases "knowledge packs" must be provided and it is justified in higher education. However good teachers know exactly in what ratio these two methods should be applied.

Problem focusing tendency is getting more and more emphasized though as a pedagogical trend it is not new at all. It appeared in reform-pedagogy at the beginning of the 20th century[2]. In this approach problems selected according to students' needs (suitable for the features of age and individual environment) are put in the focus of the teaching / learning process .

According to the method passing any knowledge should be started with the upraising of such problems (examples) which are interesting for students and have some importance therefore suitable for raising interest. Learning is not just mediating knowledge but a process with students standing in the middle. According to this tendency we do not simply talk about learning but learning environment (this is what Dewey mentioned in the beginning of the 19th century) wherein:

- students participate actively;
- teachers are not present as autocrats but as mentors and tutors;
- knowledge is developed in cooperation and interactions as a result of social environment.

While in the 20th century teachers are monopolists of knowledge in the 21st century they are mates "learning managers" who can help with his or her profession finding the way in the mass information. The importance of student centered approach is being formulated again and again but the realization takes little progress and is getting ahead very slowly. The possible explanation of this problem is that developing practical, life like teaching / learning environment means an immense task for teachers.

The characteristics of educational systems in the industrial society are the following:

- publication of facts, data, rules;
- passing closed, finite, book standard knowledge;
- homogeneous group learning;
- frontal teaching, presentation.

Requirements in the informal society:

- developing abilities and competences;
- preparation for life long learning;
- personalized learning environment, heterogeneous groups;

2 The "discovering" problem solving method is described by the Hungarian mathematician and physicist György Pólya in his world famous book: The School of Thinking.

- constructivist approach, application of collaborative methods.

The objectives of education:

- preparing for constant learning;
- intelligent learning;
- knowledge of digital writing;
- problem solving skills;
- communication skills;
- developing social and life management skills.

What should (must) we the teachers give up? That we only present and check lessons. As parents (and as former students) we know exactly what an autocratic all-powerful teacher character means in shaping our children's (and what it meant in our own) fate.

The environment in information society makes impossible objectivist, autocratic teacher mentality. Teachers of the 21st century by keeping leadership – not as being the only owners of knowledge – must be present in the learning environment as learning motivating mentors and facilitators. The duties of facilitators are known from round table talks, usually participated by several experts with the aim of analyzing and overview jointly a definite problem and building a common standpoint. The duties of facilitators are to guide these talking the way participants should not digress from the given subject.

While teaching he/she continuously learns as well and is able to handle the situation when some students are ahead of him or her. Teachers must learn to use all the possibilities that network communication and IT technology can potentially provide:

- able to access the newest information fast and cheaply;
- there are no barriers of continuous professional developments;
- almost unlimited possibilities of professional cooperation.

Hopefully as IT tools become a part of education the burdens of administration become less and we can use these possibilities.

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SECTION 3

EDUCATION TOWARDS WEB 2.0

'I do not see much sense in trying to prepare children for using intelligent IT systems of the future by running software from the past on yesterday's computers, using pedagogical methods from the day-before-yesterday.'(Komenczy, 1999)

The phenomenon web 2.0 brought a new age in Internet history. This expression was first pronounced in 2004 in a conference for web technology as a collective noun for software help editing contents and making connections on the worldwide web. The Web turned to be a platform of participation during the past few years, where it has been easier to author online and to work collaboratively. At that time it was only called as web 2.0 tools. However soon it became clear that the rapid propagation of broadband Internet and the change from readable web to re-writable web is so deep in everyday communication and slowly in all segments of social life which can only be approached as a complex phenomenon.

In the background there is the rapid development of hardware - equipments suitable for creating saving and transmitting digital voice and video. Architectures with processors capable to play and store 3D animation were produced. Despite of it the significance of web 2.0 is not hidden in technological results but in the change of how people approach things. Real time sharing of information and knowledge became reality and it is not restricted for only a narrow, upper class of the society. We can raise questions, answer, think together in communities organized on the net, using all medium which can be imagined easily - this is web 2.0. More specifically web 2.0 can be characterized by.

The web 2.0 phenomenon can result changes in the entire education not only in e-learning solutions. The major consumers of options provided (video sharing, file sharing, online communication tools, online games, etc.) are the members of the net generation and most of them are still sitting in desks. They will not ask the opinion of schools about whether they should connect to a virtual community about any subject they are interested in.

The web 2.0 reached first the students, who learned quickly how to use the tools for building

networks far away from the classrooms controlled by the teachers. The main challenge today for the educational institutes is how they could utilize the huge amount of time what the student spend connected to virtual communities.

How can the teachers answer this challenge? The only way – according the Tenegen's

conception – is to create their own online community with the aim of discovering together e-learning 2.0 and where they can learn and taste being connected to the virtual world their students are drawn towards so intensively. In Tenegen model the teachers should experience the offers by web 2.0, what the "online socialization" means, the ways of information exchange and of knowledge construction in online communities.

"In fact, one of the saddest but most common conditions in elementary school computer labs (when they exist in the developing world), is the children are being trained to use Word, Excel and PowerPoint. I consider that criminal, because children should be making things, communicating, exploring, sharing, not running office automation tools." (Nicholas Negroponte, Massachusetts Institute of Technology's Media Lab)

Question

Do you agree with him?

CHAPTER 1: ACCESING THE INFORMATION

RSS - GATHERING AND DISTRIBUTING WEB CONTENT

One of the most important features of Web 2.0 is that it has revolutionized - through the technology - how content has become accessible. One area, in particular, is how people are automatically informed about news and newly published contents, but without having to search for this. The first news collecting/news sharing software (around 2004) was only used by big news agencies, like Reuters, but as the amount of content published by the net using public (e.g. blogs) increased rapidly the need and use for these applications grew too.

The easiest way of following news and new information appearing on the Internet is to visit our favorite pages from time to time and to browse the different subjects.

As the number of interesting pages, blogs increases so does the time needed to visit them. Navigating your collection of links becomes more and more difficult, even though browsers provide “Favorites” and “Previous” functions. Visits can be a waste of time if no changes have happened on a given page. Business portals try to keep subscribers up to date by sending out regular newsletters in e-mails (weekly or monthly). This can be a useful way of keeping up with news, but some postboxes can be swamped with the scale of content.

Searching for news on web 1.0

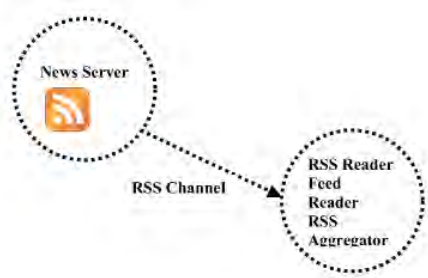
Getting news on web 2.0
Content “broadcasting” on Web 2.0

RSS icons

News channels

RSS (Really Simple Syndication) is at the heart of these new news channels. It is found on many community pages, such as on YouTube with its news channels, and thematic video collections.

On Youtube, software installed on the portal (on server side) - the RSS feeder - constantly "monitors" and extracts videos loaded up on the particular channel and periodically transmits them to users registered with the news channel. On the user side there is a "client" program - an "aggregate" - which displays the "news" being fed from the server. Users see a brief extract of newest contents, with links, and can decide whether to watch a new video (or read a new text) or not. This technology turns around the way content is accessed. The user does not visit his/her favorite pages -- the most up to date information is fed to him or her.



RSS standards

Standards are vital in ICT, so it is no surprise to find that there are standard developed specifically for RSS technology. The specific service being used will often be marked with the icon for the standard used. The most popular standards are the various versions of RSS, and Atom. Data transmission requires server and client to "speak the same language", i.e. to use the same standard. Look for an icon that marks when RSS service is provided on a web page. Look for this on sites such as newspapers.

CHAPTER 2: HOW TO USE RSS

...in browser

RSS readers are offered in browsers as a standard option. In Internet Explorer this feature is called “News Channel”; in Firefox it is called “Live Bookmark”. If you are searching on a web page where you have found the RSS icon, click on it. On the resulting page, look for the message: ‘subscribe to this news’. Following this, and choose Favorites under the “News Channel” tab, and you can choose the extracts of the most up to date news.

...to follow blog posts

The RSS service is usually built to work with the bloggers in both direction -- news supply and news collection. Visitors can register for news channels of many public blogs, and blog owners can connect to other blogs to display the extracts of latest news.

... with feed readers

There are programs especially developed for reading news -- Google Reader is one of many. These applications allow you can subscribe to your favorite websites in order to get news automatically.

... to create a personal web page

Another large group of web 2.0 tools provide options for creating personalized web pages. A basic function of these applications is to collect RSS news, but they also offer other options to create a personalized working platform for amusement - or for learning. Some of these options include:

- calendar, clock,
- links to web pages where there are no RSS services,
- notes, message editors and displayers,
- calculator,
- reading mail box,
- simple games,
- invitation for acquaintances and friends, etc.

These little options for personalization are called widgets.

Netvibes, iGoogle, Protopage, Pageflake, MyYahoo, Microsoft Live are applications, offering “sharing” services suitable for creating personalized, news-collecting web pages. We can use them to read our own selection of news and blogs, keep bookmarks, to-do lists, sticky notes, and much more – by adding widgets, add RSS feeds.

CHAPTER 3: TAXONOMY & FOLKSONOMY

Taxonomy is a **hierarchic** classification system. We use them everywhere in our lives, for example the Windows operating system stores documents in a hierarchic classification system. The aim of this type of organization, i.e. of establishing clear storage structures, is to be able to find things as quickly as possible when needed. This applies to many aspects of everyday activity, whether it is merchandise stored on warehouse shelves, or documents, images and other data stored digitally on hard disks.

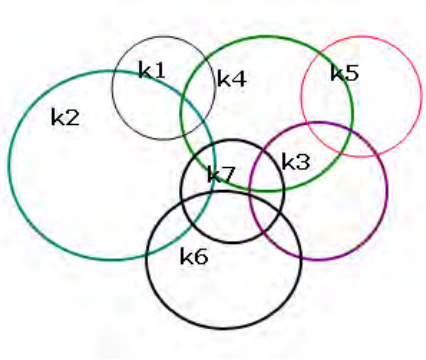
Web 2.0 developments have brought changes, not only in respect of Internet applications, but also in the methods of organizing common storage systems too. The goal is the same: to be able to find important information as easily and as quickly as possible.

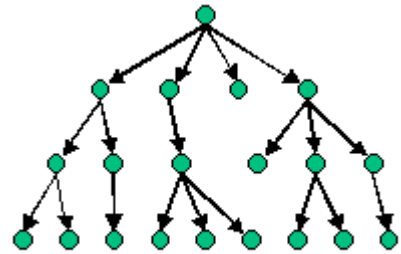
You see on the figure the tags from the Tenegen portal and to the right the links related to the tags.(http://tenegen.eu) Clicking on the tag "Web 2.0", a list of digital documents ranged in this category appear.

It is common nowadays to see 'word clouds' -- summaries of important information, important speeches, or even interesting web site -- where each word in the 'clouds' is sized according to its frequency of use in the underlying data. The most frequently occurring words are the largest, and each word is generally also an active link, usually to a list of the content which is somehow related to the given word (expression).

Web 2.0 applications can offer alternative solutions for organization on-line content. Tags can be added to all images, videos and text, which relate to the underlying content. With 'clouds', for example, searching back into the content is made easy as the font size symbolizes the number of units in a given category.

This kind of collaborative method of annotating and categorizing online content - often created spontaneously - is called a **folksonomy**, so called as it combines an analogy of the word taxonomy with the phenomena of "**social tagging**".





Folksonomy
flexible
cheap
easy to extend
democratic
organic
less reliable
lack of controll
redundancy

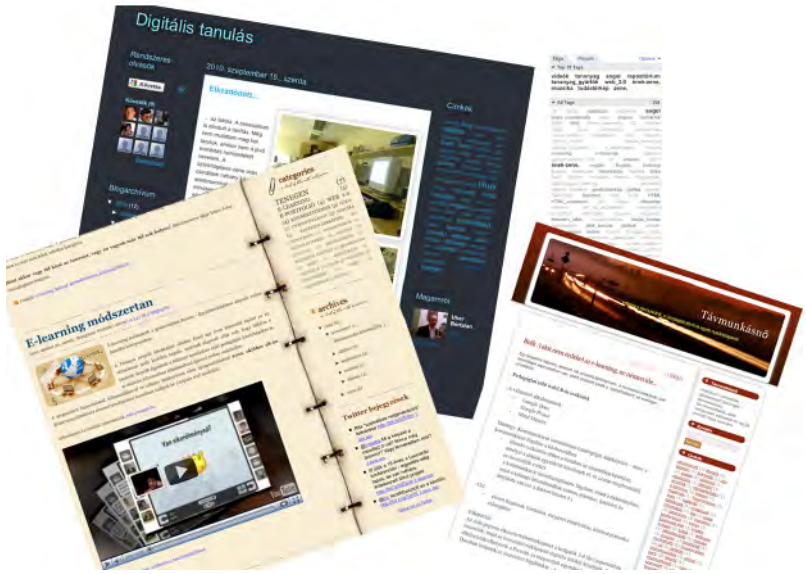
Taxonomy
rigid
expensive
difficult
to extend
controlled
consistent
clear structure
reliable

The 'folksonomy' side of this diagram shows a user-created cluster of meanings - in which the tags cover each other - whose structure can be illustrated by a Venn-diagram (or in the terminology of relational databases, a "many to the many" relationship). The folksonomy has the potential to account for multiple perspectives, but on the other hand there is the risk that clouds become chaotic. There can be a lot of redundancy if the concepts are not well determined, allowing for repetition. However web solutions employing social tagging methods are popular, offering some proof of its usefulness particularly with respect to making search easier on web pages.

TAGGING TECHNIQUES

In applications that use tagging, the tags must be separated with spaces. For this simple reason complex words, and expressions having more than one word, can be difficult to tag. To solve this problem some applications allow the use of **underlined gaps** (for example using: _) between words (as is the case with *delicious*). Other approaches use **quotation marks** around tags with multiple words (e.g. in the link sharing *diigo*).

One of the most important applications of social tagging is that of **social bookmarking,** or simply link sharing.



Tenegen examples – folksonomy in Hungarian teachers' blogs and in Delicious

Social tagging basically needed to promote new online communication, authoring and collaboration tools. For effective content-sharing, for helping people to find ones online creative works, blog notes on special subjects carefully thought out tags are crucial.

Folksonomy one of the most important forms of new media literacy needed for young people to develop successful carrier in the digital age. They are using tags spontaneously for example while sharing videos, mash-ups on YouTube, but their competences to apply it effectively later in their professional work has to be developed by their teachers. How? Teachers should learn it, try it and elaborate their own practice how to teach it!

CHAPTER 4: VISUALIZATION TECHNIQUES

CONCEPT MAPS & MIND MAPS

Have you thought of something and drew a picture while doing so? Visualization can help you get closer to a solution to an issue or problem. Pictures and figures can help with orientation. The expression “a picture is worth a thousand words” is undoubtedly true at times!

Technical developments and project management cannot be imagined without drawings and figures. Programmers and engineers model different steps in any development with flowcharts; Project managers use Gantt-diagrams for timing.

The visual method of drawing mind maps is relatively a new concept, but it can have a very wide application -- perhaps more so that in those areas mentioned above. It can also be useful for problem solving, clarifying concepts or ideas, and understanding phenomena or procedures.

This technology was developed in 1960 by Joseph D. Novák, Professor at Cornell University. He was looking for a problem solving method to help with adding or connecting new knowledge to existing knowledge patterns. He started from the concept that understanding new notions is much easier if connections are discovered between the existing and new knowledge.

“Comprehensive learning can embed new concepts into existing cognitive structures.”

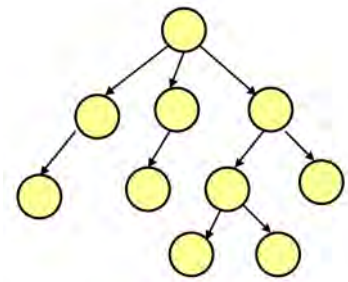
Widespread use of mind mapping in the 70s was attributed to the English psychologist and education consultant, Tony Buzan. His book, published in 2002, started an innovative avalanche in the field of mind map software. The handmade mind map (above), which was created by teachers in an English language school, is taken from his book (click for a more detailed version). It is possible that the ‘net generation’ could make spectacular, creative mind maps with Web 2.0 tools.

Drawing made simple!

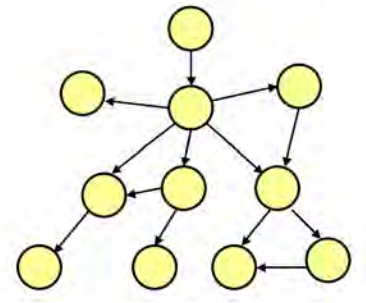
Draw small junctions - small circles for instance - on a piece of paper and connect them with lines. Give names to the junctions and replace the circles with simple images. To the end of connecting lines - one or the other or both - draw arrows. You will end up with a construction similar to this:

Each junction can be the start point for one or more connecting lines, which can lead to other, new junctions -- until a tree or a net is created.

Hierarchic structure



Network structure



These schematic figures cannot represent the creativity of figures that can be created from these simple elements. It is not easy to show the complexity of human thinking in a linear way. Concepts and keywords describing the subject can occupy the nodes. Lines represent connections between them.

Both stuctures -- hierarchy and network -- are known and have been used in mathematics and software development for many years (mainly in the theory of data storing technology and databases). There is a separate branch of mathematics, called graph-theory, dedicated to network structures.

What are the applications of Maps?

Brainstorming

We are all familiar with Brainstorming. This starts out with a seemingly good idea, but one that lacks clarity and direction. Participants take the idea and build on it, expand it and define it.

Designing sophisticated systems: analyzing complex problems

Mind Maps can be useful for private application and for teamwork, but also where new and complex systems have to be introduced in an institution when it is difficult to see the detail in different segments of the task. Design can develop by drafting the most important elements of a large plan, and gradually adding detail by ever deepening analysis.

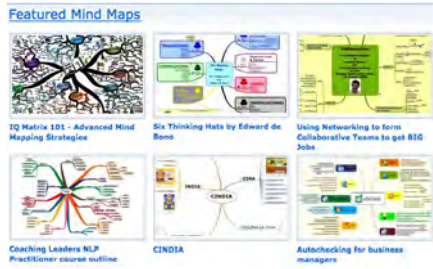
Drawing Maps can help to uncover badly defined points; can provide a framework for clarifying what is understood, and for highlighting what has yet to be clarified.

Concept systems: illustrating taxonomies

Visualizing taxonomies can be useful in understanding, or making understood, the conceptual structure of a given topic and for showing connections between concepts.

Opportunity is limited to one's imagination. Maps can use texts, images, and lines -- which can help with the overall understanding or in clarifying explanation for others. The scientific literature differentiates between mind maps and concept maps. Mind maps (or comprehension maps) are mainly useful for solving problems and for design work. Concept

maps are recommended for visualizing the taxonomy within some topics. A Net structure is recommended for concept maps, while hierarchic maps are recommended for mind maps.



mappio.com

How are they drawn?

Drawings can be created by hand on a piece of paper or on a board. It is not necessary to use a computer. Here are a few tips and ideas to make drawing easier.

- Start drawing from the center of the page and continue by creating branches.
- Use as many images and figure as many possible for illustrating keywords.
- The center of the drawing should be visually strong (and pictorial?).
- Add words and notes on the connecting lines.
- Use different font sizes (small letters, capital letters) and colours for highlighting notes.
- Use arrows for illustrating connections.
- Do not stick to one area; if you get tired of one branch work on another.
- A Map should fit onto one A4 (letter size) sheet.
- Be creative and embrace humour!

Software drawing tools

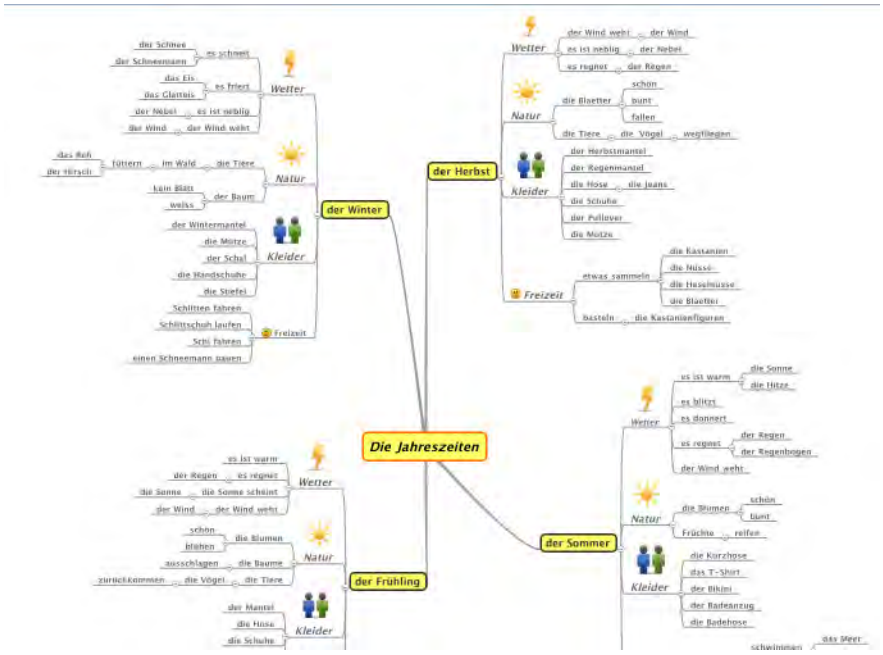
Many software packages exist for drawing comprehension maps, and many of them are freeware. (See: http://www.mind-mapping.org/web-based-mindmappers/summary.html).

One of the main popular and easy to use tools is the Mindmeister. It brings the concept of mind mapping to the web, using its facilities for online collaboration to allow truly global brainstorming sessions. Users can create, manage and share mind maps online and access them anytime, from anywhere. In brainstorming mode, fellow MindMeisters from around the world (or just in different rooms) can simultaneously work on the same mind map and see each other's changes as they happen. On the site an informative video tutorial helps you to learn its functionalities. The basic functionalities can be used free, but to reach its advanced options one has to pay for a subscription.

Try it here: http://www.mindmeister.com. You may register, or use Tenegen's account: user - tenegen; password - tenegen555.

Tenegen example

During the course the teachers were asked to try it out, and share their idea about how they can use it with their students.



MindMap of a Tenegen teacher's student

CHAPTER 5: STORYTELLING

HOW WILL A STORY DIGITAL? WHAT IS THIS?

This is the point where the multimedia technology and Web 2.0 can cause a surprise. We all like tales not only the kids. All the evidence shows that storytelling and tales slowly disappeared from school lessons, in misbelief that stories and pictures does not fit into scientific thinking and plays down the crystal-clear logical train of thought. Web 2.0 storytelling is not a miracle, only a technical opportunity to insert the media elements (text, sound, image, video) into a presentation or a chronology (timeline) easily, added a Web-based publishing and content-sharing option.

Timelines - Dipity

Dipity is an online program that allows the user to create interactive timelines with events, descriptions, photos/images, URL links, etc.

It allows users to work with content directly, or automatically pull highly relevant content from socially-curated sites like YouTube, Wikipedia, Digg and others using RSS and API integrations.

Once created, the interactive widget stays up-to-date, and can be embedded in blogs, social networks, and websites to add an interactive, engaging element to any site.

VoiceThread, another tool of digital storytelling has already been presented and tested. Both these tools have different options: strength of the Dipity is the timeline and the RSS, the specific tool of Voicethread is the opportunity to comment the story directly, and it has comic appearance.

Tenegen' story

During the course we used storytelling: we asked the teachers to tell their experiences of the first weeks in the Tenegen collaboration. The picture shows a Voicethread story with Flash animation backgrounds: http://voicethread.com/#u299711.b1105056.i5919429

CHAPTER 6: SOCIAL NETWORKS IN THE SCHOOLS

With the new communicational tools learning as a process in which the role of informal information exchange, organized into networks and supported with electronic tools, becomes more and more significant. Learning becomes a continuous, lifelong system of network activities, embedded into other activities. The motivation for gaining and contextualizing information becomes stronger if searching and evaluation becomes a cooperative, network activity. Students can significantly improve the efficiency of their learning if they take part in a network, or virtual community dealing with the given subject. Thus the collective knowledge once again becomes a source of individual knowledge ("cycle of knowledge development"). As the number of cooperative activities increases, personal social networks become the scene of informal exchange of expertise, and "communities of practice" develop. Besides the questions of "how" and "what" to learn, we now have the question of "where to learn".

In networks, contextualizing information and determining validity may both become collective processes. A list of popular topics, useful syllabuses, important links, articles and blogs, compiled in a cooperative manner may serve this purpose. Better and better software applications help the collecting and feeding back of information into one's own knowledge network. *Instead of consuming information that has been embedded in connections by institutions, learning may become an active creation of knowledge*.

> The analysis from OECD centre for educational research and innovation states: "Networks have a central role since the concept of learning has changed also. The new conception emphasizes personal characteristics of learning but what more important is that network learning concentrates especially on personal activities and the realization of self-organized learning. In this point of view, school is not at all the place for knowledge exchange but for organizing the learning process, such workshops where participants have organized programs to achieve and realize their learning goals. In the latter, the other person (student, teacher or anybody else) becomes more and more important who does not necessarily have to be in the same learning space. Networks inside a school already have functioning practices: like projects, learning groups, cooperative techniques and cooperation between teachers. We can also see networks where students and teachers from different institutes work together in a learning process." (Havas, 2001)

In practice, students are usually members of a social network. This fact can be used for organizing knowledge exchange to be built into lessons (or into its virtual carrying-on) as an excess of everyday life chat.

According to the results of a European survey of 2010 the social networking is the fastest growing online activity among youth of age 9-16. These sites offer so many attracting possibilities to keep contact, for sharing content among contemporaries. Let take a look to the figures (from the random stratified sample of 23,420 children aged 9-16 in 25 European countries):

57% of 9-16 year olds have a social networking profile – including 24% aged 9-10, 48% aged 11-12, 72% aged 13-14 and 81% aged 15-16. Social networking is most popular in the Netherlands (78%), Slovenia (76%) and Lithuania (75%), and least in Romania and Turkey (each 47%).

"The widespread application of Internet redesigned the sort of communication era where communities are developing, survive and come to end. Online communication channels are not only able to bring several hundreds of remote acquaintances to a short distance but they can do this with unknown strangers. Contacts can be created more cheaply with more people than before. This fact enriches our concepts about communities with new meanings. (Balázs Bodo, 2007)

Social networks can be very different according to their size and/ or goals. The most popular ones are those which are based on and organized for getting to meeting and know people (e.g. iwiw, Facebook, LinkedIn, MySpace, MyVip, etc.). Another large group consists of those sites which are organized according to some particular interests. These usually have fewer members. In several cases there isn't a clear difference between the two since special groups of interest can be organized within meeting networks too. This subject has a large literature background. Thousand of experts are interested in investigating the pattern and the future of virtual communities.

All of our students are members of one or more social networks. What makes them interested? According to the newest surveys belonging to groups is simply the basic need of people which can be achieved more cheaply and easily via Internet so obviously those who can use this possibility.

Some interesting conclusions of the subject analyses

- Many people assume that belonging to virtual communities alienates people and endangers real human relationships. People spend more time on the web than with their own family. However researches didn't prove this.

- Members of an online community are more willing to help each other - without expecting any return – than they are in the real life community. This incident can be explained in a way that less help can be expected from the circle of direct acquaintances. In the contrary people often get help from complete strangers from some social network. Not necessary from those who they helped before. According to statistics people have about a hundred saved phone numbers the most but they can have 200-300 acquaintances on a social network. Does it mean that people have a wider circle in a virtual environment?

- Net communities are usually more opened than real communities. This does not mean that there are no exceptions. There are some professional communities where new members can only join with the recommendations of two existing members. (According to researchers real small communities are more closed and new members are accepted harder.)

- In online communities organized for sharing contents there is a strong control against "free riders". Some people are only "consumers" without supporting the collection. They will be banned after a certain time.

CHAPTER 7: SOCIAL SOFTWARE APPLICATIONS

In the age of web 1.0 creating a social portal needed hard development and programming. Today IT experts are only involved when we want to build a completely customized social site with special services and functions. Creating an average social portal is as easy as pie with web 2.0 software. It does not requires more work (maybe even less) than creating our own blogs. What are the basic services provided by a social portal?

- Member files (registration, log in, creating customized profile, list of members, recruiting members),
- Content sharing options (up loading and presenting pictures, videos, documents)
- Chat room , sending e-mails,
- Blogs, handling blogs.

The more specific terms collaborative software and *groupware* are usually applied narrowly to software that enables collaborative work. Distinctions among usage of the terms "social", "trusted" and "collaborative" are in the applications or uses, not the tools themselves, although some tools are used only rarely for collaborative work. Social software applications include communication tools and interactive tools. Communication tools typically handle the capturing, storing and presentation of communication, usually written but increasingly including audio and video as well. Interactive tools handle mediated interactions between a pair or group of users. They focus on establishing and maintaining a connection among users, facilitating the mechanics of conversation and talk.

TENEGEN EXPERIENCES

Tenegen teacher about the Facebook

I took part on an eLearning conference, where a teacher claimed in a long presentation how injurious, dangerous and destructive the Facebook was. She told that it serves nothing else but as "liking" for meaningless and obscene rubbishes. I think not only she but we all forget about at least two things while discussing on social networks:

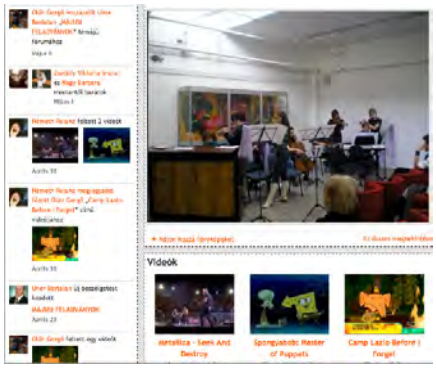
1. In social networks there are many hidden potential – even from pedagogical point of view. We are not able to utilize these values yet - but is not the failure of these applications.

2. Students are connected to social network sites not for its services, but because all of their friends are connected too. They simple are following the trends of their peers! Can you mention any period of the history when the situation was not the same? To belong to the community has been always a natural need of human being. The only difference that this need can be satisfied today on new ways offered by the network.

Another example worth to mention: the competition of the Hungarian teachers in blogging has won a teacher, who arranged a classroom lesson with their student about “Golding: Lord of the Flies” on the Facebook!” We have to pay attention what is behind the statement: “After some years the Internet will be the Facebook itself! (Robert Farkas)

Tenegen’s experiments with Ning

Ning is the social platform for the world’s interests and passions online. Millions of people every day are coming together across Ning to explore and express their interests, discover new passions, and meet new people around shared pursuits. It takes only a few minute to create Ning site to collaborate online with your student!



Ning network for students - by a music teacher
During the course teachers tried out Ning as social networks for their students. The most successful platform was created by a Hungarian music teacher, Bertalan Uher. His network collected 50 student members in a week. The students were encouraged to upload their favor music videos, audios without censorship. Everybody was very sorry when Ning stopped to be free; and the site was no more available.

Ning network for students - by a music teacher

Social network of Tenegen teachers

Do I feel that the Tenegen project is the starting point of something very special and important? Am I certain that this is

the right direction? Do I think that it will work much better than anything else I have experienced before?

In this project integration was not a mere concept, it was something that I could see, experience and try. *It was not simply a collection of multimedia materials but a real course, the parts of which were interrelated to form a coherent structure and where you always found real people on the other end of the line.*

As for the community; it is a really enthusiastic, teeming, web 2.0 community of people aiming to work and teach! The attitude this group has achieved is typical of hobby websites. It has meant that there is always someone available to trust or someone I can ask for help. It is a kind of instant-on, workplace chat room.

This is what Tenegen means to me. To tell the truth, I don’t know what it should be called. Because now it is much more than a project. (Krisztina Fodor)

CHAPTER 8: SOCIAL BOOKMARKING

Social bookmarking tools were developed to overcome these problems. Social bookmarks, or link sharing, are software systems, running on servers, and providing help for storing links organized with tags in some way. These systems also support the sharing of these collections with others. The video below shows how social bookmarking can be used.

When searching on the Internet there is always the problem of finding one's way back to page visited earlier. Favorite pages can be organized within browsers, but this is not an ideal solution for two reasons. Hierarchic saving (in folders) is too strict, forcing the use of a specific, embedded categorization. Therefore during search we must often simply reply on one's memory. Secondly, if we intend to share our collection of Favorites with someone, there is no real support in the browsers. Basic functionalities of link sharing tools:

- storing, editing, deleting link descriptors (URL, descriptions, tags),
- e-mailing link descriptions to others,
- sharing links,
- searching back and listing by tags,
- share with RSS service,
- facilitating bookmark editing by built in tools in browsers.

One of the most popular link sharing applications is ***Delicious***, however the selection is so large that some sort of specialization has appeared. For example, there are link sharing tools that are particularly good for social cooperation (like *Newswine*), and other that are mainly for scientific use (like ***Connotea***).

Diigo provides a most advanced service. It "knows" what is expected of social bookmarking and presents it in a very elegant way with many extra features. For example, it supports teamwork and is used in a highly integrated fashion. It allows supports the use of quotation marks to separate different tags, and it allows visitors to add their own comments to the entries.

On the Diigo website you find detailed tutorial to learn how to use it. Visit the Tenegen's collections on Diigo: http://www.diigo.com (user: tenegen, password: netgen555), managed during the course by the participant teachers.

Examples of social bookmarking services::
http://www.connotea.org/
http://delicious.com/
http://www.digg.com/

CHAPTER 9: COMPUTER GAMES IN EDUCATION

The world of computer games is completely unknown for many high school teachers. There are many preconceptions about the games: they encourage aggression; blur borders between virtual and the real world; and can become an addiction. There might be some truth in these theories but they cannot be generalized. Nor can it be said that games are wonder pills for learning motivation. Some teachers judge computer games from afar or by reading articles about them in the media. Whatever the judgment, it is certain that a great number of students spend most of their time playing these games. It is each one's right to dislike this activity but the pedagogical fact has to be considered that when playing games, students acquire all kinds of knowledge and abilities.

The world of computer games is very rich. It covers a lot of types and activities from chess to skill games; from role-playing games to virtual worlds; from strategic games to wars; from adventure games to simulators; from creative thinking games to the on-line version of traditional checkerboard games.

If we are willing to be acquainted with the learning potential of computer games and we would like to use them in teaching, we should first understand them and talk about this subject. This means trying them.

What should a teacher know about a computer game? In which field could a game motivate students to learn? What kind of abilities can they develop? What are the didactic tricks when using them? How can we ask help from students when using games? How should we build up a lesson if we use a valuable didactic game in it? The following table helps us to use web 2.0 tools (for example games) in teaching practice.

CHAPTER 10: COMPUTER GAMES AND SCHOOL

The good computer game	School education
1. A good computer game captures the player through identity.	Why should learning be less appealing?
2. Games are interactive and talk back.	A book does not talk.
3. Games react back, giving the player feedback and new problems. In a good game, words and deeds are placed in the context of an interactive relationship between the player and the world.	In schools, textbooks should be put in contexts of interaction where the world and other people talk back.
4. In games, players are active producers and not just consumers. They are writers not just readers. They can construct and modify new scenarios, characters, careers.	Can students help write the domain and the curriculum they study?
5. In good games, players are encouraged to take risks, because from failures they can learn, try new things and start from the last saved game.	In schools, there is much less accommodation for risk, mistakes and starting again. (see: failure)
6. In games, players can feel themselves as organizers and controllers. They have a real sense of ownership over what they are doing.	Such feelings are rarer in schools. Guidance and control are in teachers' hands.
7. In games, the problems players face are well ordered. It matters how the problem space is organized, that is why games have levels. Complex problem solving can be started from the appropriate level.	In traditional education, equal thoughts are expected from everyone.
8. Good games offer players a set of challenging problems and then let them solve these problems until they have a routine solution. The game can then offer a new class of problem to the player.	In schools, the struggling students do not get enough opportunity to consolidate and the good students do not get enough challenges.
9. Games usually give verbal or written feedback just in time.	In schools students have to deal with lots of words out of context andnone or late explanations.

10. Games situate the meanings of words in terms of actions, images, and dialogues.	In schools, they get a definition that spells out what a word means in terms of other words.
11. Games test a player's abilities but they always feel doable. This is a highly motivating state.	School is often too easy for some students and too hard for others, even in the same classroom. Students have no interest at all.
12. In games, players have to think in complex systems.	In schools, students often have to report about isolated stories, facts or qualities.
13. In games, players can explore, think laterally without risks and rethink goals from time to time.	In schools, linear thinking encourages students to move as fast and efficiently to our goal as possible without risks.
14. Built in distributed knowledge can be found in games – the player shares his knowledge with the virtual characters. In multi-player games, knowledge is distributed among real members of the game also.	Smart tools and distributed knowledge are keys to modern workplaces, though not always in modern schools.
15. A multi-player game needs serious cross-functional teamwork in which players have different skills, ages and specialties – just like in modern work.	This kind of diversity and working method is not characteristic to schools either.
16. In most games, performance comes before competence.	Schools demand that students gain competence through reading texts before they can perform in the domain they are learning.
17. Games are complex dynamic networks.	Schools are not complex and dynamic.
18. In games, feedback is quick; nevertheless, it can be set to leave players enough time to make a decision.	In schools, feedback takes a long time, however the time for answering is short and limited.
19. In good multi-player games, just in time advice can be asked from other players.	In schools, whispering and cribbing are forbidden.

(Based on Gee 2005a:2-4)

TENEGEN EXPERIENCES

How to use online games in the classroom? It was the most difficult assignment for the teachers during the Tenegen course. The teachers are not familiar at all with the games their students play almost every day. Among the 60 teachers only 4 submitted the task: "Computer games in the classroom", albeit it seemed to be simple: "Ask your students which computer games they play. Plan a project where the students introduce their games. Save the project in the repository for this course."

The instructor of the module faced hard opposition: the teachers not only do not know anything about the online gaming, but also claimed almost all computer games to be harmful with no value for educational purposes. A very interesting interview was carried out by one of the teachers in the classroom in secondary school. The students gave a list about the online games they play, and explained the rules. One of the questions was: what kind of competences can be developed by these games. The answer was: only certain special skills such as quick reflexes. They said that these games serve only as a means of relaxation and have no value in learning. They mentioned that the games have motivational potential only when their parents forbid them playing after coming home from school with a bad grade.

While Tenegen teachers were highly interested in the collaboration, to discover the pedagogical potential of all web 2.0 tools,. They learned a lot during the course, but resist ed taking part in working on the problem (utilizing online games in the classroom) at this time. Or better said, they do not actually resist, they just were not in the position to be able to take part. They know nothing about these games at all, and they were not willing to try out them. The Hungarian Tenegen community could not answer this question! According to the instructors and tutors we must not give up the discussions, but the problem of educational use of online games needs further research.

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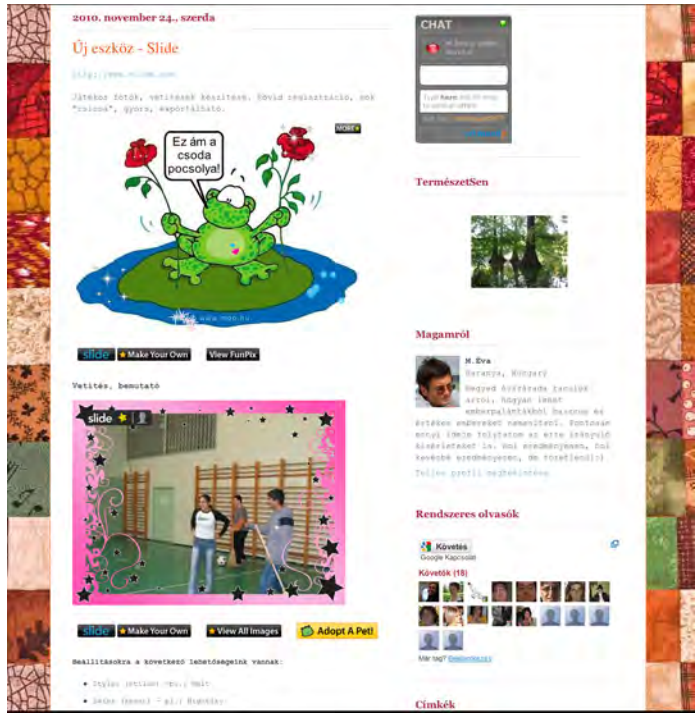
http://www.ofi.hu/download.php?docID=1636

SECTION 4

E-PORTFOLIOS IN NETWORK LEARNING

In self-organized network learning, we must have some information about the members of the network, about their curriculum, education history, previous experiences, achievements and their knowledge map. A well organized e-portfolio (personal database) can make network building and knowledge exchange much easier. Network members can gain information about other members special knowledge, their accessibilities, their notes of experiences or about the forum where their knowledge sharing takes place.

Ideally, the well-designed e-portfolio helps students to plan their individual learning routes and the assessment of their work. Another advantage of e-portfolios is when applying for employment, more and more employers require standardized e-portfolios.



E-portfolio of a Tenegen participant- Éva Matúz
(Blog: http://me-bit.blogspot.com)

CHAPTER 1: CREATE THE CONTENT OF E-PORTFOLIOS

The following list might help to create the content of e-portfolios:

Choosing the target group (to whom the e-portfolio is designed for)

- Myself
- Colleagues
- Potential employers
- Responsible persons, work organizations
- Potential sponsors or tender judging organizations
- Family, friends
- Like minded potential network members

Presentation of personal curriculum, plans and job description

- Professional career
- Job hunting: personal resumé of skills, abilities and experiences
- Identification of own learning needs and planning of an individual career supporting learning route

Presentation of own experiences and skills

- Insert a mind map containing informal and experimental knowledge, professional, tool-using and social competencies
- Insert personal stories (for example success stories as complements of the mind map)
- Presentation of using web 2.0 tools (in teaching)
- Presentation of multi-media experiences
- Demonstration of specific software experiences
- SW-analysis: my strong and weak points

Network learning tools in the e-portfolio

- Organizing interactive discussions about the own e-portfolio, blogs and professional issues
- Setting links to other blogs and e-portfolios
- Place other network pages into the own e-portfolio (home pages, Facebook, Twitter, Google Wave, LinkedIn etc.): for being able to contact likeminded users and place our comments.
- Inserting personal data
- Attaching of personal professional pages (LinkedIn, Twitter etc.)
- Inserting of learning blog

Personal digital database

- Own assignment solutions
- Studies, articles, books
- Hobby
- Favorite links
- Own multi-media works

When creating a portfolio, especially the mind map it is advised to pay attention to the skills and competences catalogue of EUROPASS:

EUROPASS skills and competences catalogue:

Social skills and competences

Organizational skills and competences

Technical skills and competences

Computer skills and competences

Artistic skills and competences

Other skills and competences

Driving licence(s)

When creating an e-portfolio to hold our experiences and our knowledge, a well-designed competence-catalogue can be helpful. This kind of articulation makes it easier to create the mind map.

Example (to be developed):

1. Professional competencies (a few – non-specialized professional – examples from education)

I am able to:

- show empathic behavior towards my students;
- conduct non-violent creative conflict resolution;
- make recognition-primed decision;
- analyze and reflect on the given pedagogic situation;
- organize team work;
- organize projects;
- use ICT tools in education.

2. Social competences

I am able to:

- communicate with people;
- listen and pay attention to anybody;
- understand other people's problems;
- resolve conflicts;
- accept differences;
- identify and appreciate each person's resources, rights, limits and needs;
- protect a team's interests.

3. Methodology competences

I am able to:

- search the Web consciously;
- use MS Office (details!) ;
- create presentations;
- create web pages;
- use e-learning environments;

4. Language competences

I am able to:

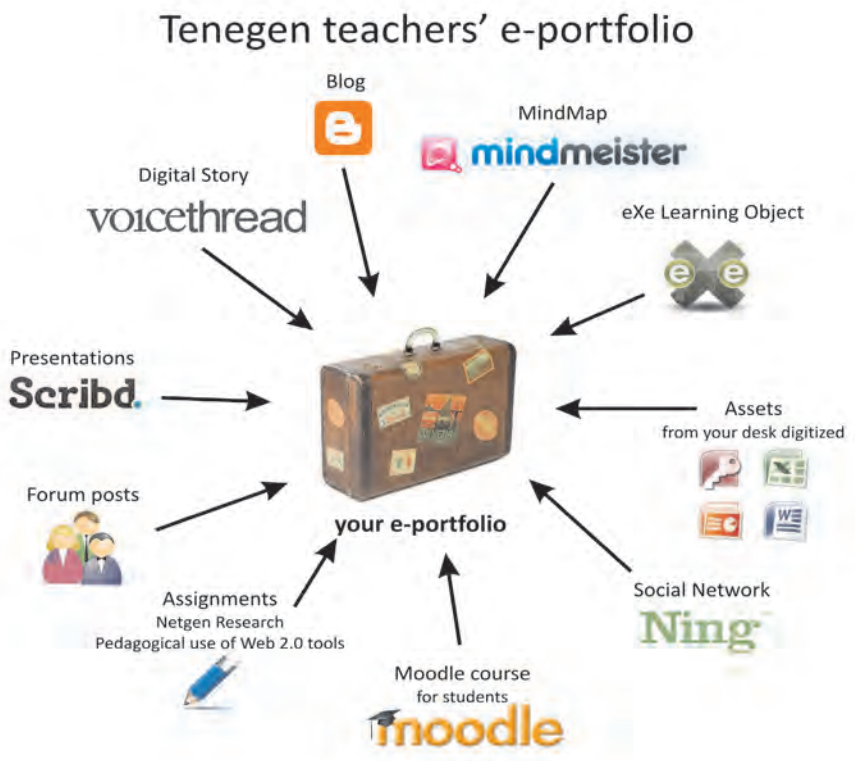
- easily talk about everyday life in English (German, etc.);
- communicate about professional subjects in English (German, etc.);
- read professional articles in English (German, etc.);
- understand professional lectures in English (German, etc.).

5. Working competences

I am able to:

- work hard;
- work precisely;
- resolve creative assignments;
- work co-operatively with others in a team;
- lead a team;
- work independently.

The following picture illustrates the possible contents of an e-portfolio



CHAPTER 2: EDITING E-PORTFOLIO IN MAHARA

MAHARA

Mahara is an open source e-portfolio system with a flexible display framework. Mahara, meaning 'think' or 'thought' in Te Reo Māori, is user centred environment with a permissions framework that enables different views of an e-portfolio to be easily managed. Mahara also features a weblog, resumé builder and social networking system, connecting users and creating online learner communities. An e-portfolio is a system in which students can record "evidences of lifelong learning" - such as essays, artwork or other such things they produce that can be stored digitally. Such things are known as **artefacts** in Mahara. Social networking systems need little introduction – think Myspace, Facebook, or Bebo. Basically, they give a way for people to interact with their friends and create their own online communities.

Mahara is much more than just a place to store files though. It also includes blogging, a resumé builder, Moodle integration and the standout views framework.

It is important to distinguish the **profile** and **portfolio**, we find them in separate menu.

The **Profile** area stores contact, **personal** and professional activity **information** about a person, a firm or an institution. You can start to build up a picture of your interests, achievements, aims and share them with other users. Always remember to think about your own personal security before releasing contact information on a publicly available View.

The My Portfolio section of Mahara is the main personal repository of resources and information. In here, you can begin to add content to your ePortfolio, in the shape of uploaded resources, or Artefacts, Blogs within Mahara and store them in **My Files** and **My Blogs**. In addition to the personal information, many other subject-specific, digitally stored elements can be stored here. A blog, a website, an image gallery, a video, a soundtrack, or a collection of links can be part of a portfolio, anything related to a person's work and activity and presentable.

Preparing an electronic portfolio has three steps:

- personal data, recording information to the database
- Profile page editing
- Personal portfolio composition, portfolio site preparation

The first two steps are necessary for the reasons outlined above, and the third is optional, because a well-compiled and edited profile page can also be part of aportfolio. This also means it is not necessary to havea separate portfolio (portfolio site) if you just want to add extra elements to your presentation and the supplied information is not enough in your profile.

EDITING

To use the program the first step is to register on http://mahara.prompt.hu site. After registration you can access the application, where you can edit and share your online porfolio with others.

Settings tab

The Settings tab allows you to configure and determine how you will use the site, how friends may link to you and how the system will contact you with important information and notifications. After logging in on the right part of the home page you can search for registered users, you can see their names, user names. The following six menu options are available:

- Home
- Profile
- My Portfolio
- Groups
- Settings
- Logout

SETTING UP A MAHARA PROFILE

Click the ***Profile tab*** to edit your personal profile page.

Your Profile area stores your contact and personal information. Each of the fields within your Profile area are Artefacts and therefore may be added to a View. Remember to consider your personal security before releasing contact information on a publicly available View.

Note: The given profile information is stored the system database, but it will not be generally public.

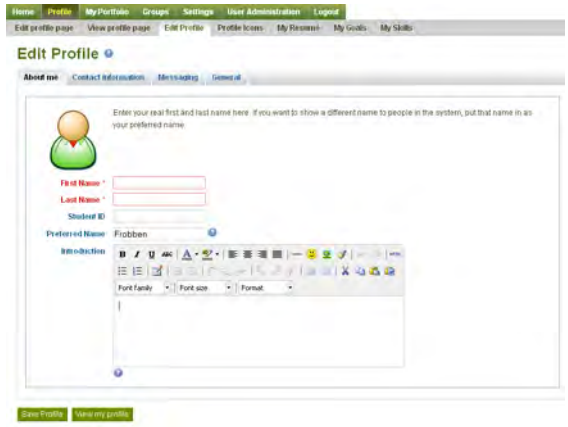
By choosing ***Edit profile*** profile button you can find the following options:

- **About me -** Use this if you do not wish to display your full name. You can write a brief introduction about yourself. The information you enter here will be searchable by other users;

- **Contact information** - Here you can add various contact details such as postal address, any external Blogs you may have, and personal website addresses;

- **Messaging -** Include details of any Instant messaging service you may use, such as Skype or Jabber;

- **General -** Indicate your profession and industry where relevant.



Click the ***profile photo icon*** to add a picture to your profile.

The ***My Goals*** area is divided into **Personal, Academic** and **Careers sections**. The ***My Skills*** area is also divided into three sections: Personal, Academic and Work The ***Resumé*** area allows you to build digital resumés or CVs which can be tailored and shared with different audiences from the following elements:

- Cover Letter
- Interests
- Contact information
- Personal information
- Employment history
- Education history
- Certifications, Accredations and Awards
- Books and Publications
- Professional Membership

EDIT PROFILE PAGE

This is where you can change the layout of your profile page. You can choose from several access options: ***Public/Logged in users/Friends.***

By clicking on ***Edit profile page you can*** place several blocks. The blocks are sorted into categories. Simply drag the selected block (pull) into the Profile, and it appears immediately. With these blocks you can display several HTML pages, media elements or videos in our profile.

PUBLICATION OF A PROFILE

If your profile was set to public access (see **profile / profile page menu**) and you want to share it with others, send the link (URL) of your profile page to the selected person, or publish it on a website or a blog.

To find the Profile link: Choose the ***Profile/Edit Profile*** button from the main menu.

Click the ***Show my Profile*** tab and from the browser window you can simply copy your profile link (URL) At the end of the reference you can see that the system assigns a unique number to each profile page id = sign.

For example: http://mahara.prompt.hu/user/view.php?id=6)

SETTING A PORTFOLIO PAGE

Click the ***Portfolio*** button and you can manage your personal views, files and blogs.

The ***My Files*** area is a repository and a document store for the folders and files to use within your portfolio. Both folders and files are considered Artefacts and as such can be added to a View. You may create any number of folders or sub folders.

Files and folders can be rearranged by dragging and dropping them to other folders. A suitably named and organised filing structure will help with the long term organisation and retrieval of your Artefacts.

Creating a ***Blog*** within Mahara is a **two stage process**. First a Blog must be created and given a title and description. Then, you can add ***Blog posts*** to your Blog. Use ***Add Blog*** to create a new Blog. Give it a suitable title and description. Select ***Create Blog***.

The Blog title will appear in an alphabetical list under ***My Blogs***, along with any other Blogs you have already created.

To add a Blog Post click on Blog title and select ***Add Post***. Give your Blog post a title and in the HTML text editor, add your thoughts. You can add Tags to Blogs and Blog posts you create within Mahara. Tags allow you to add descriptive labels to Blogs and create an index of tag classifications.

A ***View*** is a collection of Artefacts, encompassing selected files, resumé details and Blogs of your choice. A view can be kept private or shared with any number of Groups or individuals as you wish. You may create as many different Views as you like and reuse your Artefacts, even giving them different titles for different audiences.

Views can also be used to submit work for feedback or assessment to a Controlled Group. Creating a ***View*** is a 3 step process (Layout, Details, Assign Access to View***)*** to display a collection of your content and allow access to it.

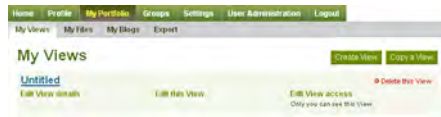
By choosing ***Create a template*** and ***Copying a View*** you can create a view template and it is possible to let someone copy your view or you can copy someone's.

There are three levels to edit our views:

By clicking on ***Details*** you can set the titles, descriptions and tags;

Go to ***Edit view*** and you can add new elements to our view or modify their layout.

By clicking ***Assign Access to View*** you can give someone access to your view.



GROUPS

A ***Group*** is an online community comprising selected or invited My Portfolio users. Groups can be used to develop and support learning and social activity in a social networking environment. You may create as many Groups as you wish. To create a Group go to ***My Groups*** and select ***Create Group***. From the Group Membership type, select preferred Group from the drop down box. You can ***Search for groups*** that allow new members to join.

SETTINGS

The ***Settings*** tab enables you to configure and determine how you will use the site, how friends may link with you and how the system will contact you with important information and notifications.

Settings/Preferences used to change your password and keep up to date with system activities and communications from other users.

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http://electronicportfolios.org/balance/Balancing.jpg

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SECTION 5

SETTING UP A MOODLE COURSE

HOW TO USE AND CUSTOMIZE MOODLE

Moodle is a Course Management System (CMS), also known as a Learning Management System (LMS) or a Virtual Learning Environment (VLE). It is a Free web application that educators can use to create effective online learning sites. It has become very popular among educators around the world as a tool for creating online dynamic web sites for their students. To work, it needs to be installed on a web server somewhere, either on one of your own computers or one at a web hosting company.

The focus of the Moodle project is always on giving educators the best tools to manage and promote learning, but there are many ways to use Moodle:

- Moodle has features that allow it to scale to very large deployments and hundreds of thousands of students, yet it can also be used for a primary school or an education hobbyist.
- Many institutions use it as their platform to conduct fully online courses, while some use it simply to augment face-to-face courses (known as blended learning).
- Many of our users love to use the activity modules (such as forums, databases and wikis) to build richly collaborative communities of learning around their subject matter (in the social constructionist tradition), while others prefer to use Moodle as a way to deliver content to students (such as standard SCORM packages) and assess learning using assignments or quizzes.

CHAPTER 1: MOODLE SURFACE AND USAGE

To use a Moodle learning portal you need a Web browser (i.e. Internet Explorer, Firefox, Safari, etc) and of course an Internet connection. Moodle requires little else of the client browser, though it is necessary to java. JavaScript enabled, but the use of materials stored in the system may need some plugins (such as Flash Player). You may also need to open particular uploaded files, so you may need appropriate software.

Many settings (small or significant) are possible in Moodle. The combination of settings allows for very different page appearances to be created, so no two Moodle installations need look the same. Generally a Moodle screen is divided into three distinct parts, as shown below.

The left and right columns are used to list the courses hosted in the Moodle instance, and to give access to the various features of the portal. The left and right hand columns (Blocks) can be turned off.

The centre of screen is the main information area. Important information, including core course content, is displayed here.

In the upper right corner of the screen the user (or more likely the system administrsator) can set the language used for the portal. Moodle has been translated into more than 70 different languages, however the administrator can limit the list of available languages. The chosen language affects only the framework text; uploaded content is always displayed in the same language irrespective of the framework setting.

BLOCKS

The interface functionality on the left and right hand sides are located in 'Blocks'. These Blocks can be custom generated to allow additional functionality, services and usage, and their position can be set or defined by the system administrator.

Teachers can modify the blocks of the particular course, too, but let's first take a look at the default Moodle blocks. Customizing the interface determines what blocks appear on the surface of Moddle system. It is possible that not all blocks available are actually included in a particular Moodle instance.

People block

Click on *People block>Participants*. You will see all the enrolled users and the teachers assigned to the course. Next to the users' name there is additional information.

User picture	First name / Surname	City/town	Country	Last access ↑
	Gábor Lajtos	Gödöllő	Hungary	now
	Katalin Hajdicsné Dr. Varga	Zalaegerszeg	Hungary	2 days 19 hours
	Szilvia Szabó	Pécs	Hungary	4 days 16 hours
	Lívia Pesti	Kozármisleny	Hungary	4 days 19 hours
	Kinga Pozsega	Pécs	Hungary	4 days 19 hours
	Árpád Varga	Pécs	Hungary	4 days 23 hours
	Dávid Kecskeméti	Pécs	Hungary	5 days 1 hour

Click on the user's name to can see his/her information in detail. This information is only editable by that specific user.

Activities block

This block contains the activities available to the course site. (Forums, Tests, Exercises, Glossary, etc.). In a Dynamic Moodle instance this block content may be constantly changing, depending on the use made by the teachers in realtion to their activity support needs for the course. This block groups all the activities of the course by the type of the activities. Click on an activity to see the list of all matching elements.

Search Forums block

In this box you can search for any words or expressions in the course forums.

Administration block

The Administration block provides some administrative functions for the students. These functions of course only for their own properties and activities. The same block is much larger for the users with more privileges (tutor, teacher, administrator), and some services hidden from the students are also available from here.

My courses block

This block displays a list with all the courses that the user is participating in, whatever the role (whether student or teacher).

Latest News block

All courses may include a forum for communication between the course participants. There is a high priority forum among the others (usually placed on top of the course) called News Forum. The latest news show some of the comments of this News Forum. By clicking on 'Latest news' the system displays this forum page, where the student can read ealier posts from partcipant, and become involved in communication with other participants through it.

Upcoming Events block

This block is based on the calendar and shows the upcoming events in the course. It contains a link to the calendar and a link to allow the addition of new events. If you click on a particular day, you get see the view for that day in the calendar. Event names are often included as a link, allowing direct access to the details of the event.

Recent Activity block

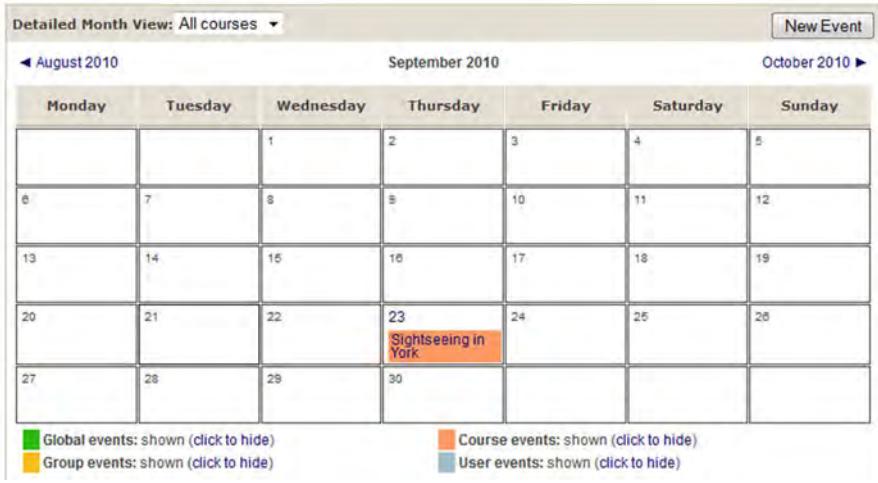
This box shows the changes made since your last login. It helps to see what has changed in the course.

Calendar block

The Calendar block shows course events -- past, present and future. Added events in the calendar may belong to a user, a group, or individual courses, as well as the portal all participants. Deadlines for tests and tasks automatically appear in the calendar.

Click on the name of the month to get a more detailed view. The current date is always in a black frame; the events have a color code as shown below.

You can show, or hide, events when you click their color code. Both the daily and monthly view contains a Preferences button in the upper right corner, which allows the user to set the calendar and to add new events. Click on the button and to see new events. As a student you can add only a user event and this event is only visible to yourself.



Online Users block

You can see a list of users logged in in the last five minutes. By clicking the name of the user in the list, it navigates to the student information page, to find more information about him/her.

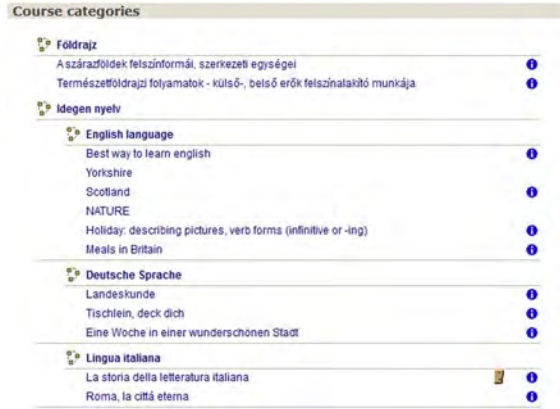
By clicking the envelope icon next to the name, you can send a message to him/her. The message will appear in the other user's message block, or if pop-up windows are enabled, the message will appear in a separate window when the users log in or refresh the page. If the message recipient is not logged, the system will also send a copy to the recipient's e-mail account.

Messages block

In the message block there are the messages you have been sent by other users. To read the messages, click the envelope icon next to the sender's name.

The central of the screen

The opening page may appear different, i.e. have different content, for those without a login and for registered users. It is possible that some information is visible only for registered users. Here is a typical content list for courses.



By clicking the icon next to the course name we can read a brief summary about the course content and its requirements. If you choose a course you'll get into the "virtual classroom" and see the actual course content.

CHAPTER 2: USER MANAGEMENT

All Moodle users need a unique user ID (username) and a password. The system identifies the users by their username, and in combination with their password allows them to log in.

There is a variety of reasons for identifying and distinguishing users. First, not everyone can access the learning materials, or the system itself. The other important thing is to assign the users to their appropriate courses or curriculum, and to give the users their different roles in the system (administrators, teachers, students, etc).

Many methods exist to create a user account. For example the system administrator may register the students, though the system may also allow users to register themselves.

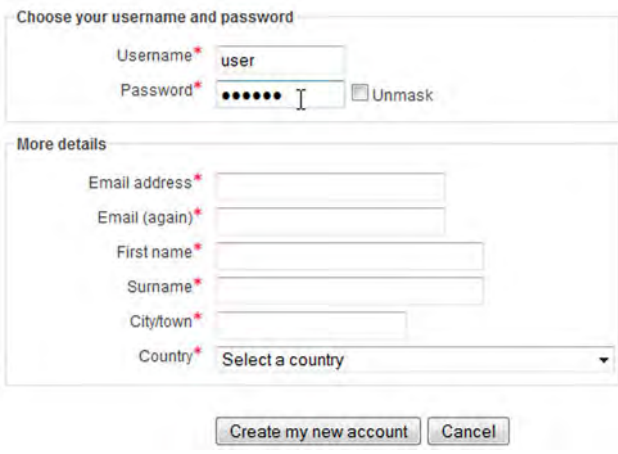
CREATE YOUR OWN USER ID

The system administrator (because he may want to save time and effort) may allow the users to register themselves in the system. Let's see how you can create a user account for a Moodle website.

Click on the *Login box>Create new account* link, and fill the dialog box. It's a simple form, and requires a minimum of data.

It is important that the requested data includes an e-mail address, because future users will receive a confirmation request sent to this address. By following the link in this request they can complete their registration.

After you click the Create my new account you will get a message which says that you will be sent an e-mail. After a while you find a request in your mailbox. This e-mail is a welcome, but it also contains a hyperlink. In order to confirm your registration you need to click on the link. By clicking the link, you will be logged into the system and confirmed as a user.



The login to the portal does not necessarily mean open access to all courses. If they are not registered with a particular course there is no access to the courses. All users logged in can do at least one useful thing: they can click on their name to change their user profile.

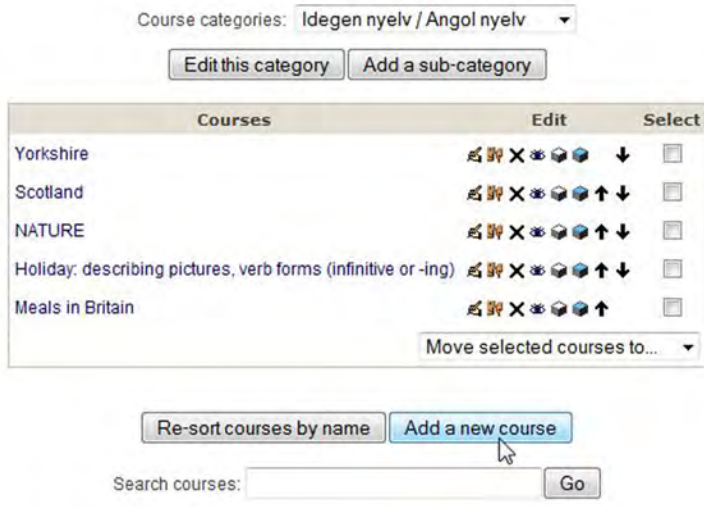
CHAPTER 3: CREATING COURSES

Courses on Moodle are organised into Course Categories. These course categories can be created only by a system administrator.

From the *Site administration block* choose *Courses* than click on *Add/edit courses*. Type the name of the category then click on *Add new category* button. Different categories can be organized in a hierarchy. The parent category can be chosen from the pull-down menu, as it has to be created first.

CREATING COURSES

To log in we need to have administrator's or course developer's rights. Administrators can reach course categories where new courses can be created from the *Site administration* block. Choose *Courses* then click on *Add/edit courses*. Enter the chosen category then click on *Add a new course* button.



Course developers have no Site administration block therefore here *All courses* should be chosen from the *Course categories* block (Courses may occasionally block popup windows) and then click on *Add a new course* button.

Course settings

Category	A course category should be chosen from the course listings. (Categories can be created by site administrators only.)
Full Name	This is the name of the course in the course listings.
Short Name	This name of the course appears in the navigation bar that is at the top of the course page and this provides an active link to the course home page.
Summary	The summary appears on the course listings page. Here we can include a brief and interesting course summary.
Format	*Weekly format:* the course is organized week by week, with a clear start date and finish date. *Topics format:* superficially similar to the weekly format, but organized around the content or features. *Social format:* organized around forums and social interaction.
Course Start Date	The date given here is important when you use the Weekly course format. This will be the first day of the first week. This setting will not affect courses using the 'social' or 'topics' formats. However, the display of logs starts from this date.
Course enrollable	Configures the course to be enrollable only in a specified date range
Enrolment Period	The number of days a student can be enrolled in a course. Students are automatically unenrolled after the number of days has expired in this setting. This is useful for rolling courses without a specific start or end time.
Number of Weeks/ Topics	The length of the course according to its format.
Group Mode	*No groups:* there is one big group from the members of the course. *Separate groups:* we can separate the members of the course into different groups such that they do not see each other's activities *Visible groups:* the groups created from the members of the course will work together, but they can also see other groups' activities *Force:* when the force setting is set to "yes" this particular group mode will be applied to every activity in that course. This will override any activities that may have a special group setting.
Availability	Allows courses to be hidden from students

Enrolment Key	This enrolment key enables access to the course for those who are registered users of the site. We supply the enrolment key to students of the course at the beginning of the course. With this key the user will be registered as a student on the course. The key should be used only when entering for the first time. If this password "gets out" and you have unwanted people enrolling, you can unenroll them and change this key. Any legitimate students who have already enrolled will not be affected.
News Items to Show	The News forum is a special forum created for each course on the front page, in a weekly or topic format. All enrolled students are automatically subscribed to the News forum. Messages are sent in email to subscribed members. The Latest News block displays a specific number of recent discussions on the screen. This specific number can be set. If this number is set to 0, the Latest News block will not show.
Show Grades	Many of the activities allow grades to be set. Here we can set whether we hide grades from students or not.
Show Activity Reports	Every activity is reported or logged in the system. From these reports we can see a student's activity and involvement of the course. Student access to their own reports is controlled by the teacher via this course setting. It is advisable to turn this feature off because showing activity reports can place a load on the server, slowing it down.

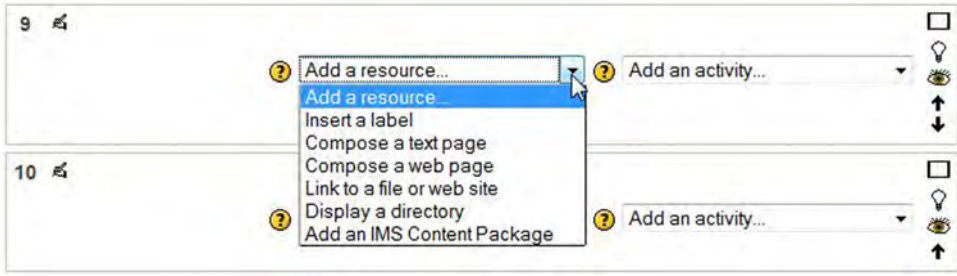
After changing settings, do not forget to click on *Save changes* button.

CHAPTER 4: ADDING RESOURCES

After setting up a course, we can start to load it up with content. We can add content to all courses if we have an administrator right. With a course developer right we can add content only to the courses we have created ourselves. After logging in, choose *All courses* from the *Course categories* block and select the course you wish to edit.

In the *Administration* block the *Turn editing on* button allows us to add content and activities to the course. The content and activities of the course can be edited within the middle of the screen. At the beginning of every course we shall see an icon of a hand holding a pencil. By clicking on this icon we can write the introduction to our course. Formatting the text used similar tools to those available in MS Word. The same icon found in the topics editing section, is used to write topic summaries.

The summary should be a brief description, for example about the lessons of the given topic. Students will see this text next to the number of the topic or next to the number of the actual week in case of a weekly format.



In the middle of the screen two columns of drop-down menus can be found for adding content. The menu on the left has a static set of options, but that on the right column is dynamic depending on the modules available.

From the left drop-down menu the following resource file types can be chosen:

TEXT PAGE

Type a name for the resource into *Name*. Write a summary about the content into *Summary* (text written here will appear in various partsof the system so the text should be brief). Finally write the main content into the *Compose a text page* input area.

WEB PAGE

This process is almost identical to composing a text page.

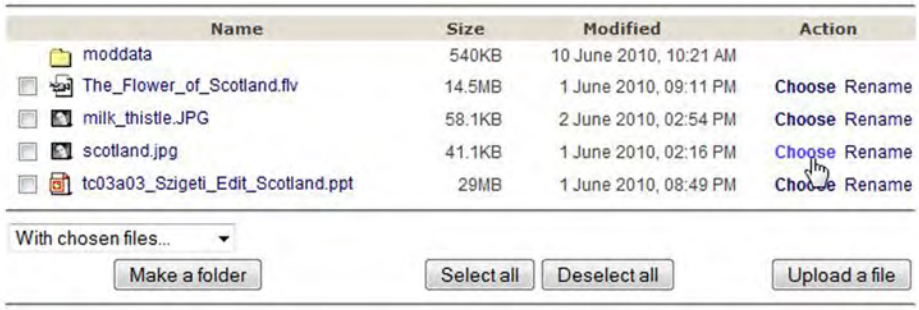
The key difference is that the text area can be formatted, and we can insert pictures, tables and references. Those who are familiar with creating HTML pages and know how to use HTML editor can even create the web page by clicking the <> icon one of many icons available for formatting.

LINKING TO FILE OR WEB SITE

This option allows files to be uploaded and used within a course. These files can be documents, tables, presentations, PDF files etc.

CHOOSE OR UPLOAD A FILE

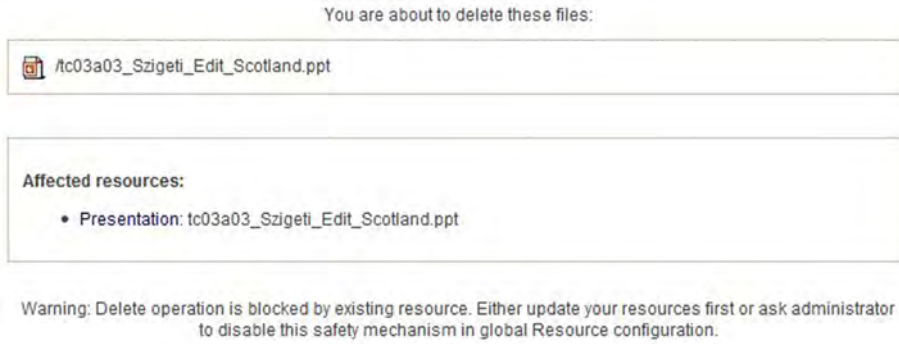
The *Choose or upload a file* button lets you select a file from your computer's disk or to choose a file already uploaded -- for whatever reason. The pop-up window shown below allows you to browse through the files already uploaded to choose for the function in mind.



Naturally, you can also upload a new file to the server. To upload a file click the *Choose or upload a file* button, then browse through your computer's file and then *Upload a file*.

DISPLAY A DIRECTORY

Files uploaded and stored on the Moodle server can be organized into folders or even into a complete directory structure. To use the directory, choose *Files* from the *Administration* block. We can create folders, put files into folders or delete files and folders. Content being deleted from a course is difficult to delete by accident. It has to be approved for deletion first.

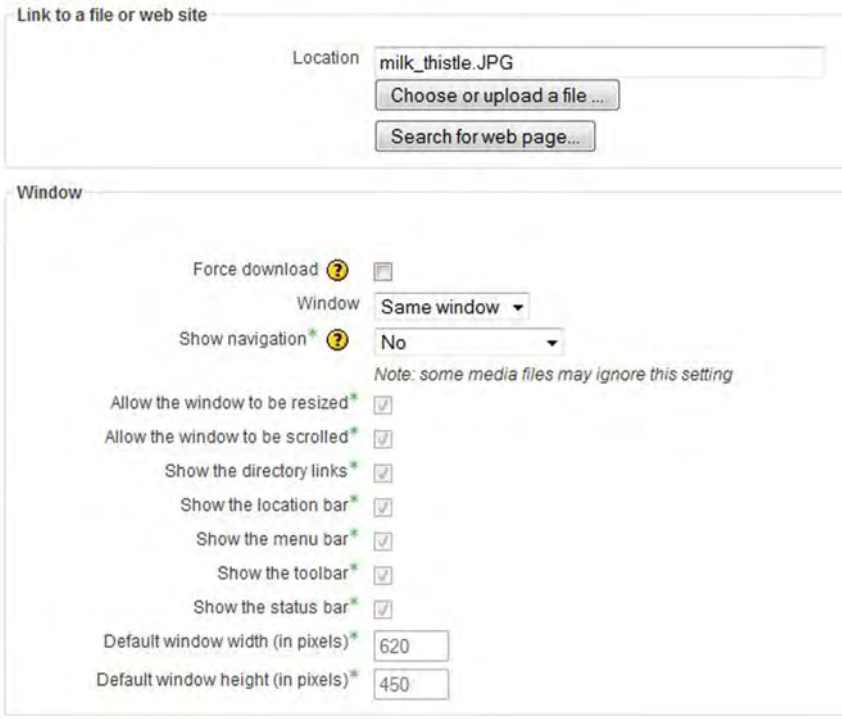


SEARCH FOR WEB PAGE

Clicking on *Search for web page* button a pop up window will appear with the Google search engine. You can use Google to search the web for a web page which you want to make available as a resource. Copy the URL and paste it into *Location*. From here students can link to the web.

DISPLAY A CONTENT

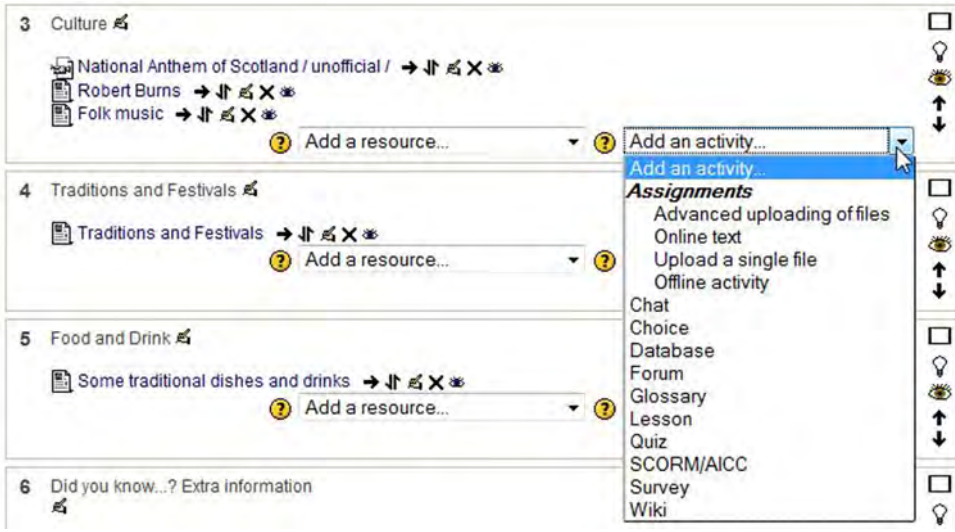
If we have uploaded static content into a course, we can configure how it is displayed. Through the editing mode option at the bottom of the page we can choose whether to have the page appear within the Moodle page or to open in a separate window.



CHAPTER 5: ADDING ACTIVITIES

In every course module we can have lessons that contain concrete information (static content), or we have dynamic content features. The latter are the social interaction functions that allow students to communicate and collaborate with each other, to work together on a project, to mark each other's work, and to upload ready assignments. Tutors can monitor progress and interactions in all of these.

Dynamic content or activities can be selected for addition from the drop-down menu on the right side of the screen when the module is in 'Editing on' mode.



FORUM

The Forum is an asynchronous communication tool, which means that participants do not have to be logged in on the portal at the same time to use it for communication. Messages are stored in order that participants visiting the forum can see and reply to them any time.

We can create several forums in Moodle at the portal level as well as at the course level. Students then can create topics and post comment replies to a topic. After sending comments they appear immediately on the portal and students subscribed to the forum will receive them in email within 30 minutes. During this 30 minutes a student can change and correct their own comment if so desired.

The *News Forum* is a special type of forum which defaults to automatically subscribing all participants in a course. Comments in the News forum can be set to appear on the main screen.

To create a forum select *Forum* from the activity list. Give a name to the forum than choose its type. Forum types can be the followings:

A single simple discussion	We can start a single topic discussion. Every student can answer it (and reply to others answers of course) but they cannot initiate a new topic.
Questions - Answers	Everybody can initiate any number of new topics and can reply to others comments.
Each person posts one new topic	Each student can post exactly one new topic.

There are a number of subscription schemes. Should every student be subscried to all forums?

No	The student can decide whether she/he wants to be sent email copies of the comments
Yes, forever	All course users will be subscribed automatically and they will not be able to unsubscribe themselves
Yes, initially	All course users will be subscribed initially but they can unsubscribe

We can allow students to rate each others' posts on a Likert scale. Grades may have numerical values, or words/phrases from a scale system. We can also set the maximum size attachment and the number of comments allowed in a certain time period.

CHAT

Chat is a synchronous communication tool which means that users have to be logged in at the same time to communicate -- a bit like talking to each other! Chat is usually focused on specific topics, though new chat rooms can be set up for any subject. To add a chat facility select *Chat* from the *Add an activity* drop-down menu.

Enter a name for the chat room and write a description of the purpose of the chat room in the introduction area. Content written in *Next chat time* and *Repeat sessions* defines whether the chat room is active or not (when students can expect to find somebody in the chat room) but setting a date and time here will not restrict access to the room at other times. Chat sessions are recorded for a certain time period allowing users logging in later to follow the discussion easily.

QUIZ

Setting the quiz function

The Quiz function in Moodle is a tool for controlling the acquired knowledge of students. Well-designed quizzes can be created easily from a pool (or bank) of questions. They are effective and make good use of tutor time, mainly if the computer is used to score everything. By setting advanced options we can allow students to retake quizzes for practice or optimize quizzes for assessment.

To create a quiz select *Quiz* from *Adding an activity* drop-down menu. Give the quiz a descriptive name and write an introduction including any special instructions for taking the quiz and for specific scoring rules.

There are a lot of options for displaying a quiz, as well as for its functions. Let's see them.

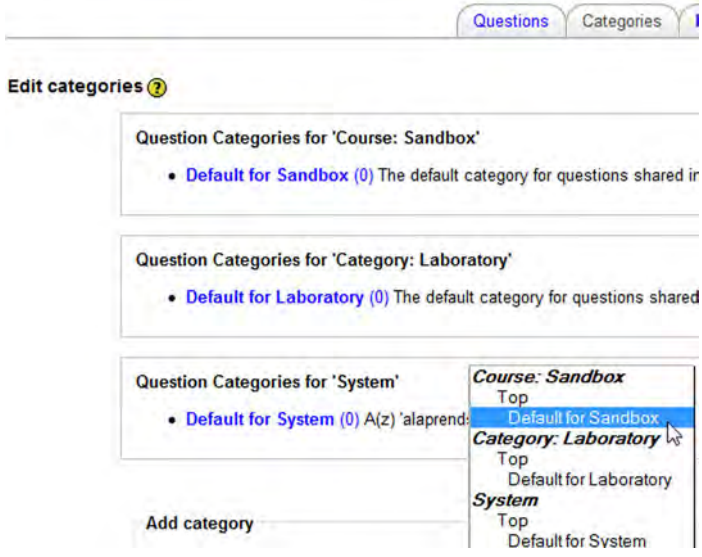
Open the quiz / close the quiz	The time period when the quiz is accessible for student attempts. Opening and closing time can be omitted.
Time limit	Students have to complete the quiz within that time. (different every time). In setting this time limit we limit the time students have to search for answers.
Shuffle questions	The order of questions in the quiz will be randomly shuffled, which also makes it harder for students to copy from each other.
Shuffle within questions	The order of answers within each question will be randomly shuffled for the reasons above.
Attempts allowed	The number of attempts a student can make.
Each attempt builds on the last	If multiple attempts are allowed then each new quiz contains the results of the previous attempt.
Grading method	The method to calculate the final grade.
Students review options	Immediately after finishing and grading the test selected options from the first editing screen will be displayed. It is advisable to turn this off if multiple attempts are allowed.

After settings click the *Save changes* button.

Creating questions for a Quiz

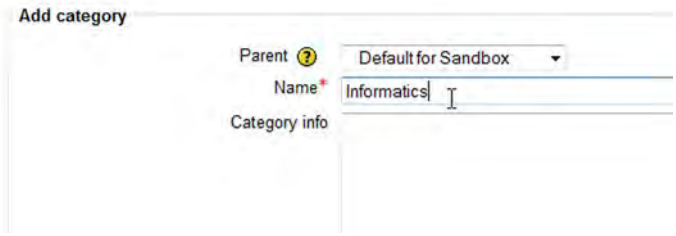
Once we have saved our changes, we'll see the second editing screen where we can add questions to our quiz. In Moodle we can also use questions created for other courses. Select them from the *Category* drop-down menu.

Questions should ideally be organized into categories. The relation between these questions and categories are similar to files and folders on our computer. Categories can be created in a hierarchy, again like in a directory. To use categories click on *Categories* tab.

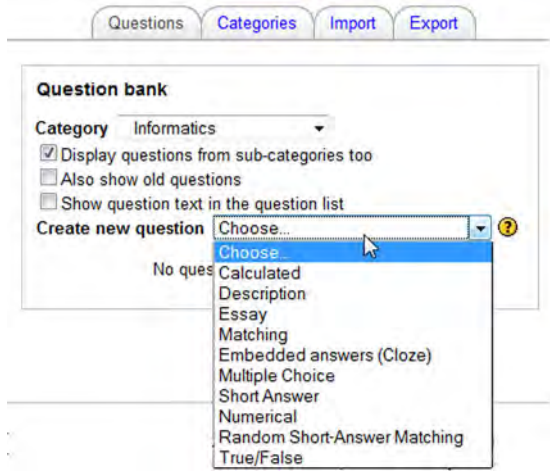


Type the name of the new category. A description in the Category info area is useful, but not compulsory.

In the *Parent* drop-down menu we choose which category to place our new category in.



Once we have created our categories it is time to add some questions. From the *Questions* tab, select a category from the Category list which we want to add a question to then select the question type from the *Create new question* drop-down menu.

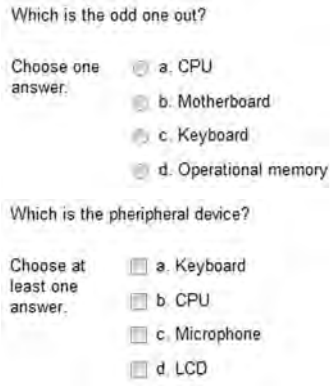


Multiple choice

Students can choose the answer from a list. Setting options are the followings:

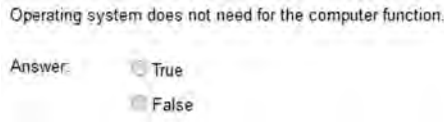
Category	Which category should be put the question in.
Question's name	Giving the question a descriptive name is important because it will be used to track the question later.
Question	The question text.
Image to display	Image(s) related to the question
Default question grade	The maximum number of marks for the correct answer.
Single or multiple answers?	*Single-answer question:* if only one answer is allowed then this will be selected through radio buttons *Multiple-answer questions:* answers are chosen through check-boxes.

Multiple-answer questions	Two answers should be chosen at least, and they should share a percentage of the overall grade for the right answers. Positive percentages for correct answers are obviously supported, as are negative percentages for wrong ones.



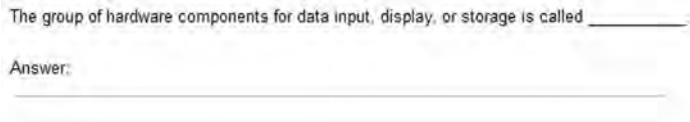
True - False

Only two possible answers: True or False. Write the response into the answer field then set whether it is true or false. By choosing the correct answer maximum points are given to the student while the wrong answer is worth 0 points.



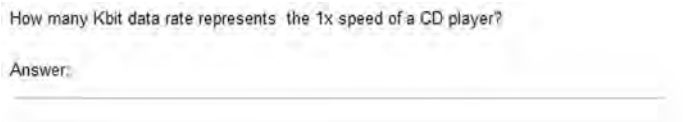
Short-answer

Short-answer questions require the student to type an answer -- a world or a phrase. We can choose whether capitalization is important or not. Fill in one answer at least and give each answer a percentage of the grade. Negative points are not acceptable.



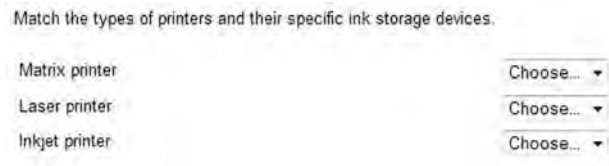
Numerical

Numerical answers are a lot like short-answer questions only the answer here is numerical, specified within a range of answers.



Matching

Multiple questions and matching answers should be given. Fill in at least three questions and answers. When solving the test all possible matching answers can be selected from a drop-down menu.



Calculated question

Create a question with two placeholders and a multiplication sign. Instead of numbers use letters in the placeholders.

For example: {x}*kB how many bit?

Enter the formula for the answer using the same placeholders

{x}*8192

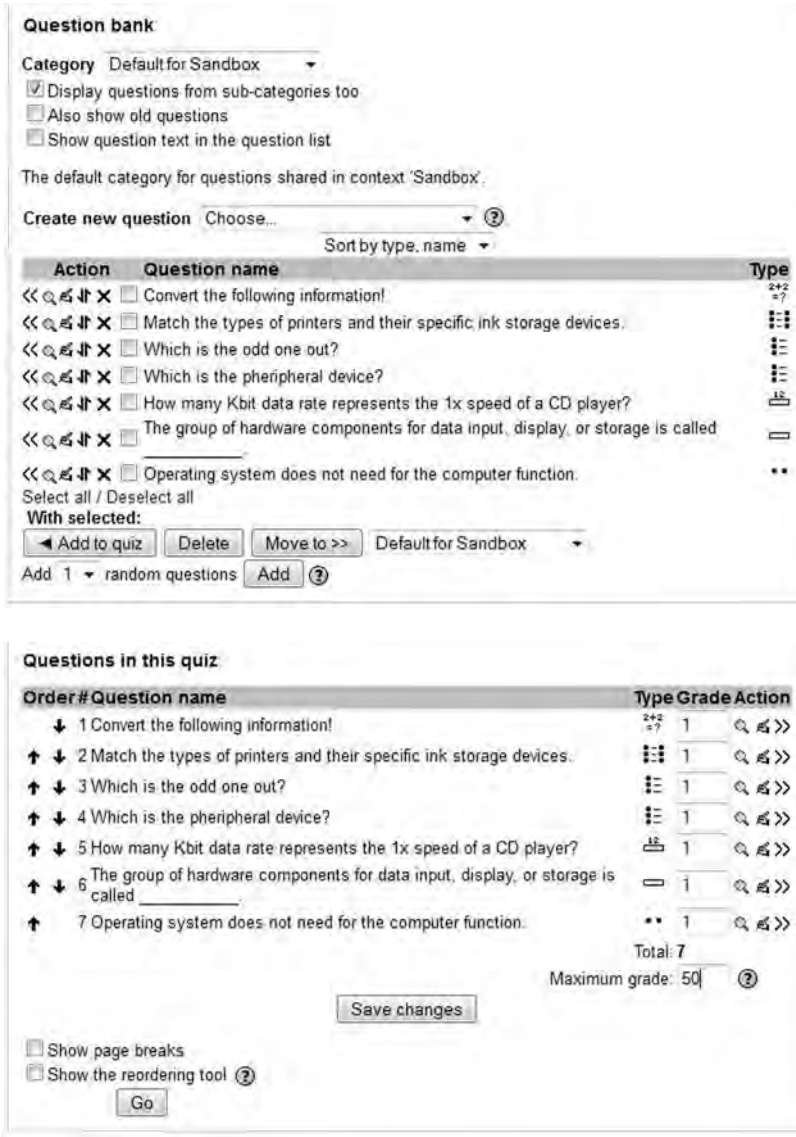
Moodle will randomly select values for x therefore the question and the correct answer will be different always.

Quiz questions and categories can be edited by selecting Questions from the Administration block.

Adding questions to a quiz

Once we have created our questions, we'll need to add them to the quiz.

Questions we can use can be found on the right side of the screen. We have to move questions we want to add to the quiz to the left side. The chevrons (<< icons) to the left of the questions are used to add individual questions to the quiz. We can also select several questions using the check-boxes on the left of the question list and then click the Add to quiz button at the bottom of the list to add them all at once. If we have a lot of questions we can create a variety of quizzes by clicking on Add random questions button. The same question can be added to a quiz only once but we can also choose questions from other categories (if they have been published when creating the category).



After adding questions to a quiz we can change the number of points they carry by setting the relative weight of each question. The maximum grade does not have to be equal to the sum of the grades for the individual questions. The maximum grade for the whole quiz should be set. The system will rescale the result of the quiz from the sum of the grades, the grades achieved by the student and the maximum grade.

ASSIGNMENT

The assignment allows teachers to collect work from students. These can be online text assignments, where students submit, or upload, files of their work, or offline assignments which can remind students of assignments they need to complete (searching, in the library, classroom assignment etc.) To create an assignment, turn the editing mode on, and select *Assignment* from the *Adding an activity* menu.

Give the assignment a name, and describe it in detail. Set a number or a descriptive grade for the maximum grade for this assignment. (See the chapter named Assessment of students work). Select the available and due date for the assignment. Allowing late submissions lets students submit assignments after the due date. Choose the type of assignment from the Assignment type drop-down menu. See the table below.

Assignment type	Other settings
Upload a Single File (When a file is submitted several times only the latest file is retained)	*Allow Resubmitting* - Students will be allowed to resubmit assignments after they have been graded (for regarding of course)
Advanced uploading of files (allows to upload several files)	*Allow deleting* - uploaded files may be deleted before submitting for grading *Allow notes* - students may enter notes into the text area *Hide description before available date* - if enabled, assignment description is hidden before the opening date.
Offline assignment (files cannot be uploaded)	
Online assignment (assignments are in text form by using the system's word processor)	*Comment in-line* - the text submitted is copied into a feedback comment field so teachers can write comments directly into the text

If enabled, teachers are alerted with a short email whenever students add or update an assignment submission.

GLOSSARY

Experts in a certain scientific field - for example computer science - create new languages, new words, new vocabulary of acronyms, names, etc. that we see and use every day. We might not know what these mean exactly, so students studying these fields can consult glossaries of definitions to avoid misunderstandings.

The Glossary in Moodle is a powerful tool for learning. The Glossary is much more than a normal vocabulary: terms and their definitions can be linked, and site wide glossaries can be used over the whole portal so that definitions can always be reached.

The great advantage of the glossary module is that teachers and students are able to develop a shared vocabulary list together. Entries and definitions can be graded and added to the final grade.

Adding a glossary

Click the Turn editing on button and select *Glossary* from the *Add an activity* drop-down menu. Give a name to the new glossary, then a short description about the purpose of the glossary. Now we can choose from many options in the glossary setup. Let's take a look:

Global glossary	A glossary is global, if its entries auto-link to the definitions of new expressions throughout the whole Moodle site, not only to the given course.
Glossary type	Main glossary - secondary glossary Students may add entries to secondary glossaries, and teachers can import them into the main glossary. Main glossaries can be edited only by teachers.
Duplicated entries allowed	When set to 'yes', it allows several definitions to be entered for a given word.
Allow comments on entries	We can allow others to leave comments on glossary definitions.
Automatically link glossary entries	If allowed, a text-filter feature automatically creates a link from a word in the course to its glossary definition. Linked words are highlighted (default color is blue).
Approved by default	We can decide on students' entries. If we set 'yes' they are automatically added to the glossary. Alternatively they may require the teacher's approval before adding to the glossary.
Allow all entries to be rated?	We can select the grade options of entries in the glossary

Important! Automatic linking of glossary entries will work only (even if we have allowed when creating the glossary) after setting Glossary auto-linking between Filters in Modules in the Site administration block.

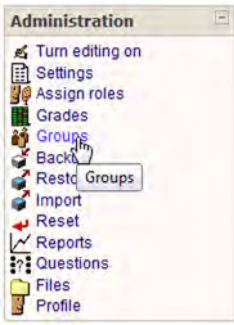
Adding a glossary entry

To add new entries select the glossary page you want to add to and click the *Add a new entry* button. In the new window we can add new entries and their definitions. Enter the world you want to define in the *Concept text* field, and write the definition into *Definition*.

If there are synonyms you want to include with the entry, add them to the *Keyword(s)* text area. Enter one word per line. These words will also be highlighted in the module - or in case of global glossary, on the whole portal - texts.Other options can be set by check-boxes. If we want an entry to be linked automatically within the course we should check the *This entry should be automatically linked* check-box but it works only if have allowed it in the glossary settings. *This entry is case sensitive* setting specifies whether matching exact upper and lower case is necessary when performing automatic linking to these entries. By checking *Match whole words only* for example, a word like "VLE" will NOT be linked to a glossary entry called "vle".

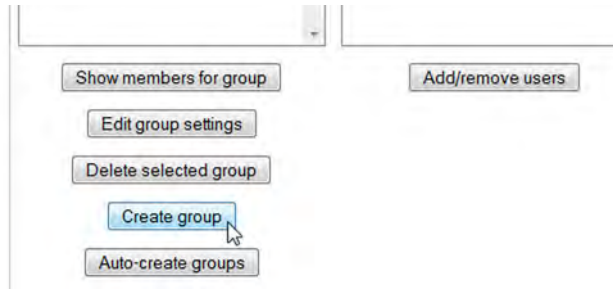
CHAPTER 6: CREATE GROUPS

Moodle supports group work in all activities. User Groups can be useful if we have a number of groups studying the same course simultaneously. We can build up the groups by courses, for the entire course or only for certain activities.



Enter the course in which you want to create a group, then in the *Administration* block, select the *Groups* link.

On this page there are two list boxes side by side, and a few keys below the fields. The left-hand list contains the groups, and on the right you can see the group members.

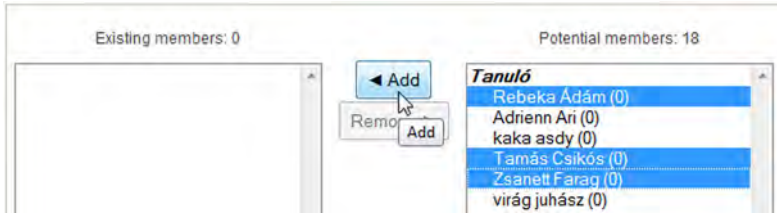


If you have no existing groups, you'll need to create one. Select the *Create Group* button on the left-hand list below.

Give a name for the group, or you can define an Enrolment key. This new feature is found in Moodle 1.8 onwards, with a similar role to that of the course Register code. If you give this group code to future users, they can enter the course and even automatically become a member of the group. This feature helps to simplify the course teacher's administration work. To finish group creation, click on the *Create Group* icon.

ADD GROUP MEMBERS

If you would like to add new members into the group manually, select the group name from the list on the left, and then choose the Add/remove users from under the list on the right. Choose the required group members from the list and drag them to the left field. (Use the Ctrl key to select more users at the same time)



GROUP TYPES

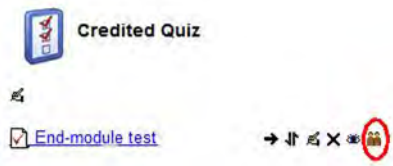
There are three possible group types in the system.

No group – Each participant has specific activities in the course;

Separate groups – The group members can see the other student's work in their own group, but not the other members of other groups;

Visible groups – Everybody works in his own group, but can see the other groups' work, too.

If we define the group settings for the activities, then this will control what the students will see in the forums, tasks, etc. As well as the group settings, the system starts a new forum for each group.

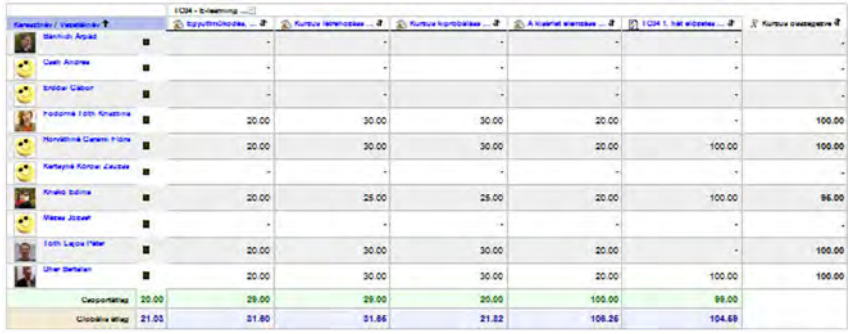


In Editor View, click the rightmost icon next to the name of activity and select a group type. The icon shape, and the group type will shows the chosen one. The group settings for the complete course can be defined in the course settings in the *Administration* block>*Settings*.

CHAPTER 7: ASSESSMENT OF STUDY PROGRESS

Evaluation of student work is essential in all forms of education. It is important for both the students and the instructor to give feedback on the level of the curriculum that has been learned, and for knowledge transfer.

In Moodle all activities can be scored. You can set the maximum score when you define the activities. The tests' evaluation and scoring is done automatically; for other activities there is a need for the teacher or the tutor to do the assessment. Points awarded for each activity are shown in a table. Click on the *Grades* link in the course *Administration* block.



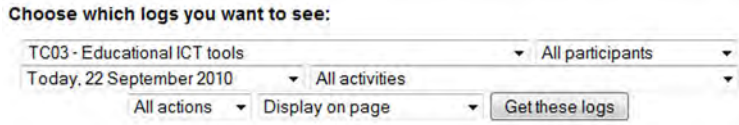
		-	-	-	-	-	-
		-	-	-	-	-	-
		-	-	-	-	-	-
		20.00	30.00	30.00	20.00	-	100.00
		20.00	30.00	30.00	20.00	100.00	100.00
		-	-	-	-	-	-
		20.00	25.00	25.00	20.00	100.00	95.00
		-	-	-	-	-	-
		20.00	30.00	30.00	20.00	-	100.00
		20.00	30.00	30.00	20.00	100.00	100.00
	20.00	29.00	29.00	20.00	100.00	99.00	
	21.03	31.80	31.66	21.32	108.26	104.69	

The table rows contain the course participants, and in the columns are the activities. The table inside contains the scores for each activity. The right-hand column shows the total score of the assessed activity.

The scoring of activities is very important, and so it is necessary to consider how individual tasks weigh up against each other, as this will affect the final, overall result.

CHAPTER 8: MONITORING STUDENT'S ACTIVITY

Moodle logs any changes to the course. These logs store the information in minute detail, and show the overall user activity. The system administrator, or the teachers, can create a list from the log entries with this option. For this option, choose the *Reports* link from the *Administration* block of any the courses.



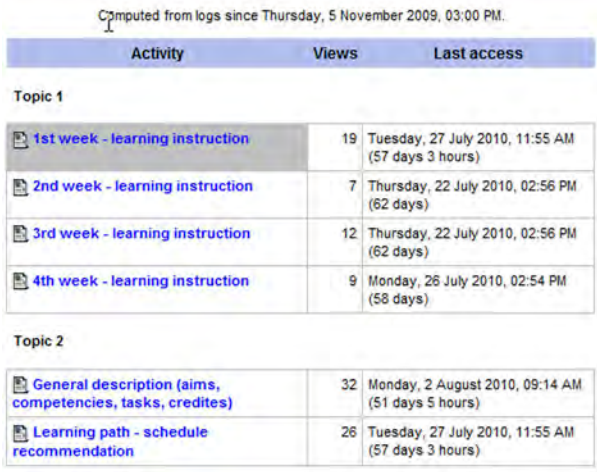
By default, it can create a daily list about the current course activity, which can then be filtered on demand. In the pop-up window, choose the proper elements and create a list. You can also set the courses and the activities for inclusion in the listing during a given period.

After specifying the filter criteria, click the *Get these Logs* button.

Time	IP Address	Full name	Action	Information
Wed 22 September 2010, 02:56 PM	78.139.14.1	Gábor Lajtos	course report log	TC03 - Educational ICT tools
Wed 22 September 2010, 02:56 PM	78.139.14.1	Gábor Lajtos	course report log	TC03 - Educational ICT tools
Wed 22 September 2010, 02:50 PM	78.139.14.1	Gábor Lajtos	course view	TC03 - Educational ICT tools
Wed 22 September 2010, 01:58 PM	78.139.14.1	Gábor Lajtos	course view	TC03 - Educational ICT tools
Wed 15 September 2010, 03:59 PM	78.139.14.1	István Kiss	course view	TC03 - Educational ICT tools
Wed 15 September 2010, 01:56 PM	78.139.14.1	István Kiss	course view	TC03 - Educational ICT tools
Thu 2 September 2010, 11:40 AM	78.139.14.1	István Kiss	book print	TC03 - Website editing
Thu 2 September 2010, 11:40 AM	78.139.14.1	István Kiss	book view	TC03 - Website editing

The list displays the events in chronological order. The IP address is the ID of the computer, from which the request is received by the Moodle server. Click the name to look at a particular user's profile, and in the *Steps* column you can read the recorded activity. By clicking this activity you can read it.

Returning to the previous page an *Activity report* is also available. This link creates a list about all activities grouped by topics, where access numbers are totaled along with the last access date.

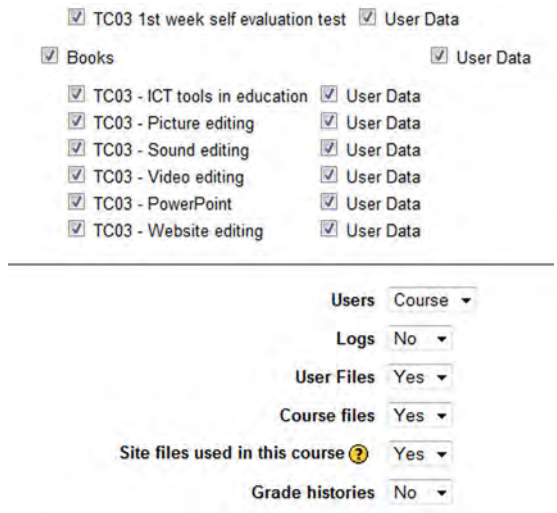


CHAPTER 9: BACKUP COURSES

In the role of administrator, course creators or teachers can backup courses. Enter the course and select the *Backup* link in the *Administration* block.

This window contains two columns with check boxes. On the left there is the module curriculum and the list of activities, while on the right there is the user data related to the activities. Choose the appropriate boxes for saving. (Eg. if the activity is a forum, the link to users' data can be the forum posts).

If you scroll down to the bottom of the screen you find more saving options. From the Users list you can select which users of the system are to be saved (for all users of the system, only the course members, or no one). You can also select Logs of the course (this is not the same name activity, but the activity-logs produced by system), the user materials (e.g. uploaded profile picture) and course files (materials sent by students) to be saved or not.



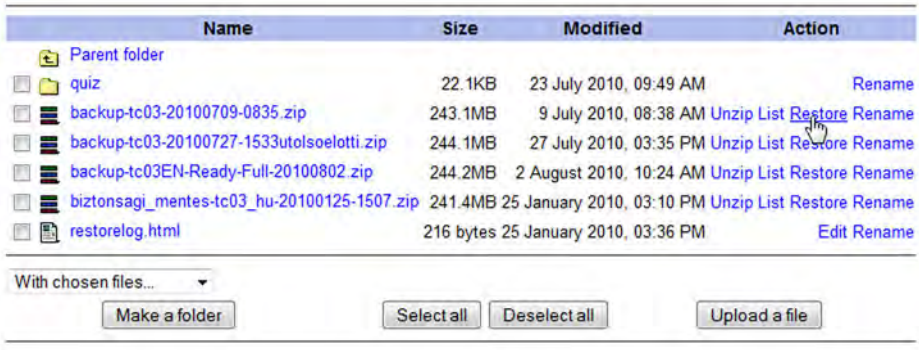
After making your settings, click the Next button and you will receive a summary of selected items, the success of the backup, and finally you can view the saved file. The created backup file is placed in the course files *backupdata* subdirectory in Moodle. It is advisable to save the file to another media, too. To save the file, click the name.

The Moodle backup format can be used elsewhere, in other Moodle hosted portals. Therefore, the backup can also be used to export courses.

CHAPTER 10: RESTORE COURSES

Due to a system failure loss of data may require the restoration of the courses. This feature can be used even in cases where you want to use an existing course at any place. It's not called recovery, but rather seen as importing data.

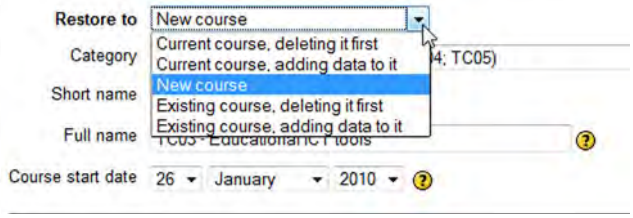
Enter any course in which you have an administrator, course creator or teacher role. You have to login to a courses to see the Administration block, where you can set the location of the desired course. In the *Administration* block, select the *Restore* link, and look into the backupdata subdirectory in the course directory. If you have already saved this course before, you will see the saved results here, as the system default saves the file to this directory. (The picture shows a compressed zip archive.)



You can make use of it immediately, e.g. to restore the backup. However, if the backup is in other places (local hard disk or CD) you first have to upload it into this directory.

To start restoring the process select Restore link in the line of the zip file. It has a number of steps. First the system asks for confirmation, then shows a summary of previously saved data. You then have the possibility of setting some important parameters. In the Place of restoring pop-up list you can choose how the course will be restored. If you choose the *New Course* element, then on clicking the Next button the import process is done immediately and the restored course will appear as the original.

If you select the following: *Existing course First Delete or Adding data* to an existing course, you must highlight the existing course before the restore process starts. The other setting is the same as outlined in the backup section.



SECTION 6

DESIGNING FOR E-LEARNING

> *E-learning has the potential to dramatically change how we teach and learn. It can greatly improve classroom experiences just as much as it can provide economic advantage by lowering costs for online learners and improving value (Twigg, 2002).*

Designing for e-learning is not as hard and as costly as you might think, but it still is a relatively new concept. It is not just about *designing* courseware, it is also about *delivering* it. Therefore good quality e-learning designs address the whole online learning experience.

The first thing we need to do is make sure our design work is going in the right direction. Many of the old 1990's multimedia development projects squandered a lot of resources and resulted in inflexible resources that quickly died off as technologies rapidly changed. The lesson we should learn from that this time around is to **be technology independent** – to create course materials and assets that are reusable, flexible and of long-term value. In this chapter we will examine how you can do just that, starting by architecting your new electronic learning materials for maximum flexibility and long-term reuse. We will look at how using **open standards** for information will help you to achieve this and to gain freedom from being dependent on specific tools and publishing formats. We will illustrate this approach with real-world examples of educators doing this today.

E-learning design and production is actually a **team based effort**, and depending on the complexity required for the resulting course, quite a number of individual specialists may contribute their areas of expertise, be they programming, illustrating, animating or configuring online learning environments. Designs and author's contributions quickly become embedded in the actual production process for the course. As the production team develop the interactive assessments and features specified by the designers and created by the authors and course developers, frequent requests are made of authors to provide more content for specific learning contexts.

It is also helpful if everyone involved shares a common understanding of the collaborative **e-learning production process.** It helps to explain why things have to be done in specific ways, and to schedule all individual contributions. We will look at a proven information flow, or production, model and consider its real-world use.

Good e-learning design is helped greatly by using pragmatic **templates** for commonly used course components that are proven to work well online. We will explore together what templates offer the e-learning designer, and how they affect all parts of the course production process.

Finally, we will look at exactly how designing for e-learning affects all stakeholders involved in the process from initial concept to final release and use. It is very satisfying to design a successful piece of e-learning, but remember that success comes not from launch, but from repeated use over many months or years. Experienced e-learning designers know that good materials evolve with time, and that conducting regular feedback and improvement updates are also needed to ensure continued e-learning success.

CHAPTER 1: GOING IN THE RIGHT DIRECTION

USE COMMON STANDARDS AND FORMATS

Most e-learning today is delivered using a computer network. The biggest one is the Internet and it has now reached more than 27% of the World's population, 1.8 billion people.

Networks benefit greatly from standardisation as it helps to promote universal recognition and easier sharing of content. Two examples of successful standards are **HTML** – the page format interpreted by the Web browser applications (Internet Explorer, Firefox, Safari, Opera) that present the information we read on the internet, and **XML** – the format for 'smart' content. This 'smart' content certainly includes learning materials which contain useful additional information such as whether is it a case study, assessment question or learning objective. Authoring formats like MS Word and document distribution formats such as PDF, while in common use, are not very open or 'smart', and are difficult to integrate well into good quality e-learning environments.

There are some specific standards bodies of importance in education too. The EDUCAUSE Instructional Management Systems Project (IMS) maintains many useful specifications and standards to do with how we can format questions, answers and exchange data between online learning systems. IEEE Learning Technology Standards Committee (IEEE LTSC) certifies and accredits contributions from other organisations wishing to publish technical standards – particularly for industrial and corporate training use.

So what standards should we be interested in when designing for e-learning?

Unless you are a technical specialist dealing with the set up of systems and computers, then it is usually best to keep things as simple as possible while ensuring the capture of good meaning in your course materials. The most flexible standard for doing that is XML or "eXtensible Markup Language" but this is not a language you work normally choose to author in. So, its usually best to work with a team of people who can take what you write in MS Word or whatever your preferred authoring tool is, and capture, manage and update it for you in XML. That way you can together create high quality and consistent sets of learning materials, that will work well in any online learning environments, and in print too if you need it.

Other standards are useful for *packaging* up sets of e-learning materials and a common ones are the IMS Common Cartridge Alliance and SCORM packaging standards that are being adopted by more and more learning environment system vendors. However be aware that these are packaging standards – they are not content standards. The content of a SCORM package can be simple Word or PDF files, for example. This different possible use of standards – as a packaging standard or as a content model standard – is an important distinction. Using XML as a content model standard will result in richer learning materials. Once you have created your e-learning materials, your production and learning environment teams can use these open standards to load them into a range of different learning environments helping you to become independent of any one delivery option or system. By adopting open standards and formats you will also be able to create your own resource – oriented information architecture for teaching and learning, and have many useful course materials and assets that enable easier reuse and sharing.

Real-World Example: OpenLearn

OpenLearn is a free learning environment started by the UK's Open University in 2006. Used by more than 8 million students, it has over 8000 study hours of learning materials from Open University courses. The website continues to grow with new course materials being published regularly. Content is mastered in XML format and distributed freely using the associated LabSpace service for other educational institutions to reuse and develop.

Single-source your e-learning materials

E-learning materials developed using open standards can benefit from "**single-sourcing**" where they are "written once; reused many times". This saves much time, effort and unnecessary expense. Simply put, course materials are created in a single or 'master' version which is cherished from then on. Updates are made to that master either directly by the production team or indirectly by having authors revise the course materials in whatever editing format they choose to use.

Why is single-sourcing of value to producing your e-learning Courses?

The obvious benefit is you only change one file once, for all of your print, online and electronic deliverables. This prevents duplication of effort and improved accuracy. The second benefit is that the production team can use batch production tools, that can typeset a textbook automatically in minutes or generate thousands of web pages in seconds. This takes the 'sweat' out of publishing and lets the production team update all versions of your e-learning course easily and frequently.

Single source masters evolve. They become more and more capable of supporting useful interactions on a variety of new and existing delivery devices including eBooks, DVDs, Websites, learning environments and gesture based tablet devices. This gives teachers and students much greater choice about how and where to use the e-learning materials which in turn often supports greater uptake and if for commercial use, sales and income.

These learning materials also become real assets for education providers, and collectively they can be managed as a "**Domain**" of content that can be fully exploited for its value. Management of a domain of content lets you introduce organisational–level management tools such as Content Management Systems, which can manage intellectual property rights, revisions and release numbering – all helpful in quality assurance processes. This 'content management' focused approach moves away from traditional course development methods though not by as much as might seem evident. The core processes of learning design and authoring arguably remain much closer to the traditional ones understood by all educators, not just those in e-learning.

Real-World Example: Connexions

Connexions is a non-profit start-up launched at Rice University in 1999 that aims to reinvent how we write, edit, publish, and use textbooks and other learning materials. It is a global repository of educational content and it supports collaborative development and free availability of material. Instructors and authors can modify this

material for any purpose. It operates an open, standards-based approach based on single-sourcing with XML, for sharing and advancing knowledge to benefit the global educational community. It currently has 16,680 reusable learning modules held as 1010 collections in a content management system for you to use, and represents a great place to start sourcing content for many higher education e-learning courses.

DESIGN FOR FLEXIBILITY

Where is the best place to start when setting out to design new materials for e-learning? Consider these questions first:

1. Are the materials going to be used collaboratively in class, individually over the Internet, or both?

2. Are the e-learning materials to form some sort of "bricolage" that can be orchestrated into a unique learning experience each time, or should they be complete, containing everything an individual needs to study and learn from themselves?

The answers to these questions will greatly influence your chosen e-learning design. The diagram below illustrates that there is actually a spectrum of learning and delivery options, and that while e-learning technologies can be applied to them all, the careful placement of your design on this spectrum is crucial to successful use.

The Flexible Learning Spectrum of study modes

Your e-learning designs will fit somewhere along this spectrum, and will be influenced by the age and self-motivated studying abilities of your students, and by your desire to support more delivery online. For example, if you are designing e-learning materials for use exclusively in a classroom with a teacher (left-hand side of the spectrum diagram above), you can ensure they have features to aid teachers more than students – revealing information step by step for example. Many team based e-learning simulations use this approach – running the economy of a country and stepping through various time events for example, or being in control of a fleet of ships trading all over the world, and putting students into class-based teams to compete in doing this.

As soon as you start moving away from teacher conducted learning and towards more self-driven online/distance learning (moving from left to right across the spectrum), the e-learning and course materials need to be enhanced to support self-study and revision. Blended e-learning designs, seek to gain the benefits of both class-based learning and the proven effectiveness of relevant distance learning structures. This is seen by many educators as the best approach for both first-degree and post-graduate course. The e-learning materials however must still be designed to support-self study and revision.

The more to the right on the spectrum we design for, the more effort must be put into designing and authoring course materials that can provide the missing face-to-face component. Full distance e-learning delivers a complete education programme regardless of student location,

and the materials have to be high quality (fit-for-purpose) with the teacher completely written in. Some distance e-learning designs can assume periodic or scheduled teacher input, but maximum gains in flexibility, scalability and cost savings come from treating all students as distance learning ones, and having materials that are fit wholly for that purpose. This also provides students with more freedom about where and when they choose to study.

One thing stands out. If materials are developed for a distance model then they can be used to support delivery and learning at any point on the spectrum. This is not the case if materials are developed solely to support face-to-face delivery.

Real-World Example: Edinburgh Business School eMBA

Have you heard of the eMBA programme from Edinburgh Business School (EBS)? It's the largest non-tutored online MBA programme in the World, with 8000 students studying on it this year from 150+ countries. It was a distance learning correspondence programme back in the 1990's but was successfully re-designed to make the transition to becoming an online programme.

Although students only have to sit and pass 9 subjects to get their MBA qualification, EBS has created a wide and varied content domain of 45 courses and 900+ individual course components all formatted as single-source masters in XML, and all using the same core learning design template and online delivery approach. Fit-for-purpose content and careful delivery environment designs results in fewer than 3% of its students contacting the Business School with any course query. This in turn greatly reduces the teacher support and administration costs, and allows the programme to scale easily and quickly to accommodate thousands of students around the World studying simultaneously at their own convenience and pace.

Students in this successful e-learning design are assumed to be mature and confident adult learners – a specific market niche. They are given maximum flexibility over when to start studying, and can sit examinations within their own countries four times a year. It is a very successful example of a well-targeted online learning design.

CHAPTER 2: USE COURSE DESIGN TEMPLATES

Course design templates are a very pragmatic way to aid e-learning designers and authors. They help to remove a lot of the 'unknowns' of course design, and ensure that for each course all the necessary components needed for successful delivery are present, well integrated, and clear to all stakeholders.

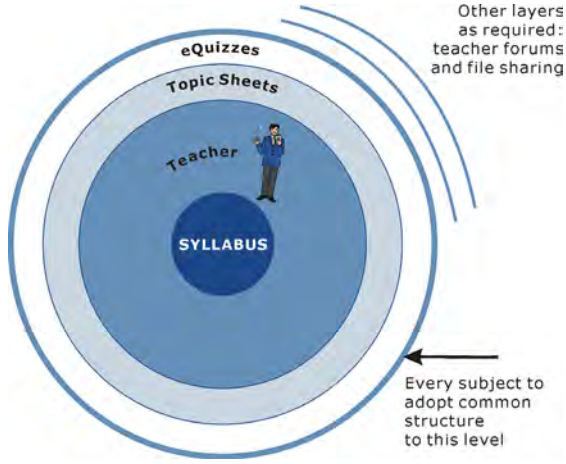
Lets us now look at five real-world examples of templates being used successfully today for schools, higher education and continuing professional development (CPD).

EXAMPLE SCHOOL DESIGN TEMPLATES

The first design template example for schools is one that is in use today by the UK's ***ifs*** *School of Finance*. ***ifs*** operate an e-learning service for 300+ UK schools that delivers a series of "introduction to money" e-learning courses for pupils aged between 14-16 years old covering topics such as personal banking, currency exchange, credit cards and borrowing. Individual PDF topic sheets are downloaded and handed out in class and gone through face-to-face with a teacher.

Simple e-learning environment with the PDF topic sheets for teachers

Pupils are then required to log online and undertake an interactive end-of-topic "eQuizz" comprising 10-15 interactive assessment questions and illustrations. The individual pupil marks are summarised for teachers in a summary page. The design template for this teacher-centred e-learning course is illustrated as:



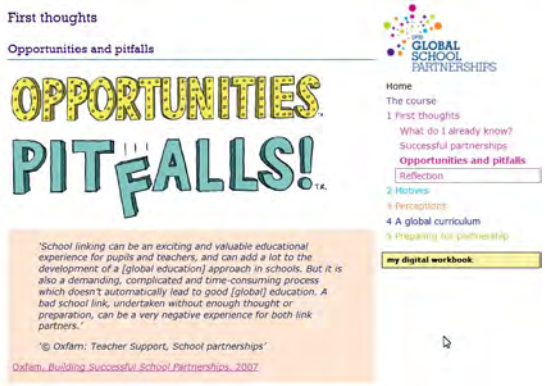
A course design template for a teacher delivered e-learning supported course

The Pupils like the one to one interaction they have with the eQuizzes, which are highly graphical and include drag and drop features and real-life pictures. The eQuizzes also provide feedback that helps them to re-visit the questions they got wrong and links back into the study topics.

E-learning eQuizzes with drag and drop graphics and section links

The teachers appreciate the automatic summary sheet showing which pupils are having difficulties, and also have a private "teacher only" message board to exchange experiences, ideas and useful files between schools. The course design template is therefore appreciated by developers, teachers, pupils and administrators alike.

As a second e-learning design template aimed at schools is one used to deliver a series of online workshops for the British Council's Global Schools Partnerships programme.

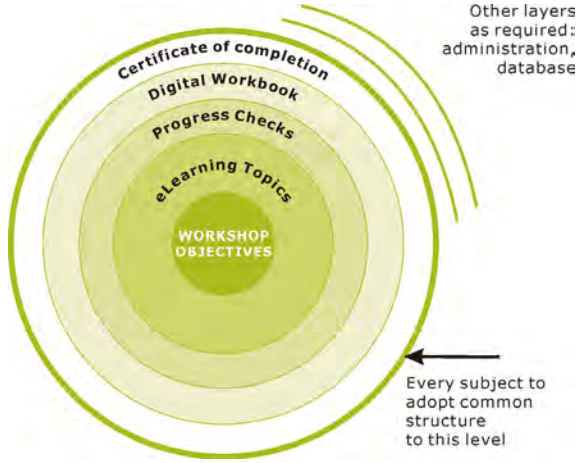


E-learning workshop to replace previously delivered face-to-face ones

This series of workshops for teachers is aimed and fostering links between schools around the world in different countries. Teachers are encouraged to register online in a custom learning environment linked to from the main British Council website. They then work their way through a series of highly graphical and interactive topics which contain different paths according to their selected preferences. The e-learning designer and course author have

embedded "reflection boxes" within the materials at various points, so that the Teacher's comments are stored and recorded in-situ. They are also added to a "Digital Workbook" which can be visited separately by both the student and a British Council support person who can approve the work for final acceptance and certification.

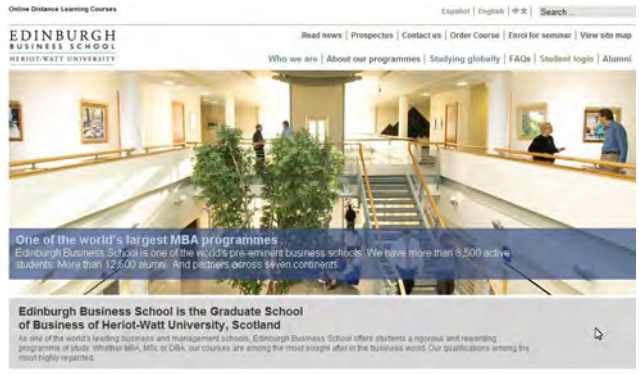
Key progress details are summarised for British Council administration staff who monitor achievement and progress. The course design template for this e-learning course is:



Design template for the Global Schools Programme online workshop

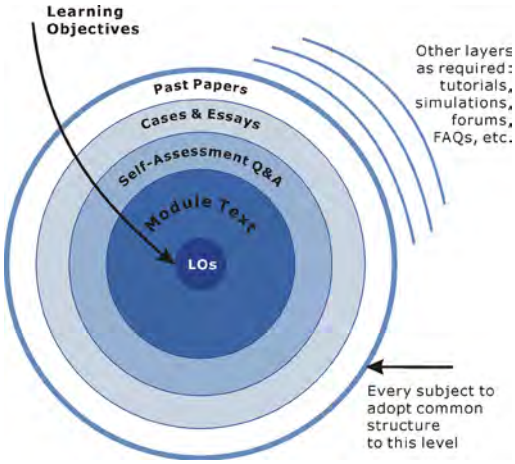
EXAMPLE HIGHER EDUCATION DESIGN TEMPLATES

The first higher education design example we will examine is the template successfully used by Edinburgh Business School (EBS) for their online eMBA programme.



Edinburgh Business School home page at www.ebsglobal.net

The EBS course design template has a number of course **components** including a core module text, self-assessment-questions with comprehensive answers, case studies and essay articles and past papers. There are carefully chosen to suit the target student audience – adult distance and online learners who have had previous successful higher education study experiences.

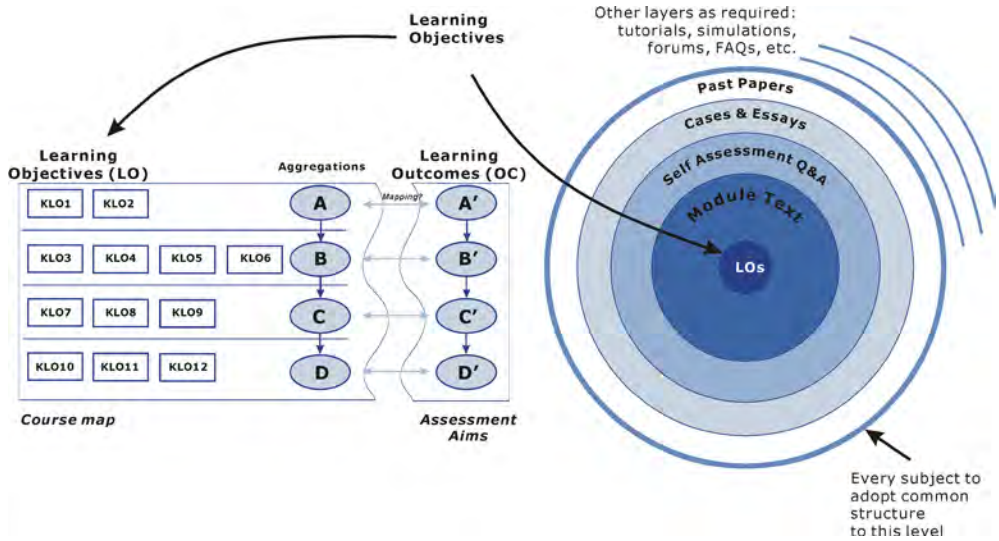


Particular emphasis is given to a good quality core module text with instructional guidance written in, and lots of content rich self-assessment-questions with answers. These are very popular with students as they enable lots of examination practice. While the core text still delivers the bulk of teaching and many students still choose to read it off-line, there is particular e-learning value put on the self-assessment questions which are taken interactively online. These are aligned to the individual learning objectives; link back into specific places in the module text; and provide rich, formative personal feedback for each student.

The EBS course design template with comprehensive module text

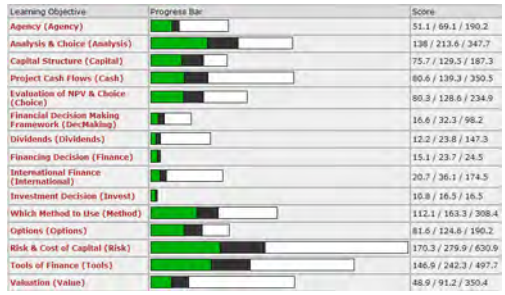
EBS require that all courses in their programme must have all of these core components which means that all the course authors know they must provide them, the editors and production team can assume they will be there, and the online delivery environment can be setup to deliver them all in a consistent way. While this 'standardisation' around the course template makes life easier for the designers and developers, it also makes thing much more consistent for the students using the courses which helps to improve familiarity and confidence in using them.

Underpinning the EBS e-learning course design template is the use of learning objectives. Courses are authored with between 5 and 12 **Learning Objectives (LOs)** that map directly to the **Learning Outcomes** the students are assessed against. The next illustration shows this and now these links can be made explicit for students in a **course map**.



Relationship between EBS's learning objectives, outcomes and course components

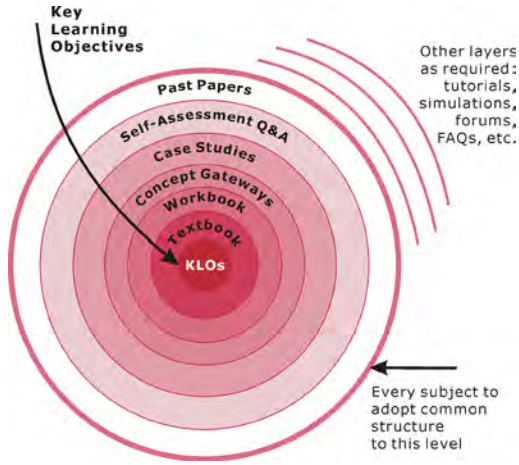
Every course component is also structured with the LOs which means that students always know what learning objectives the current course materials relate to. As they work through the self-assessment materials in particular, a personal profile graph as shown below, can be displayed to them showing which LOs they are making good or poor progress with, and enabling them to focus their revision into areas of weakness.



A graph showing a student's individual progress against the course Learning Objectives

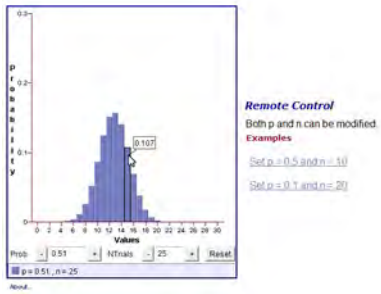
In this graph, the green bar means an assessment pass for questions related to that specific learning objective; black is the total questions attempted so far by the student; and white the total questions available for each learning objective in all the assessments for the course.

The second higher education design template we will look at is one in use today by Napier University in the UK. In this more traditional course design template, greater emphasis is given to using a separate study guide or "workbook" that compliments a standard Publisher's "textbook" and structures how the student should undertake the course and progress through the core textbook. This design is still towards the right-hand side of the flexible learning spectrum diagram however. There is no face-to-face contact time in class for example and the course offers a much richer set of self-assessments and past examination papers.



Example design template using a core Publisher's textbook and separate study guide

The other notable new e-learning component specific to this design is the "Concept Gateway". These are individual e-learning objects or online tutorials that provide alternative ways to study and comprehend difficult topics for a subject – perhaps a statistical method or a key concept that is difficult to grasp at first. Concept gateways can be text, graphic, video, animation or simulation based, and they make the best use of the e-learning medium to address key subject concepts.

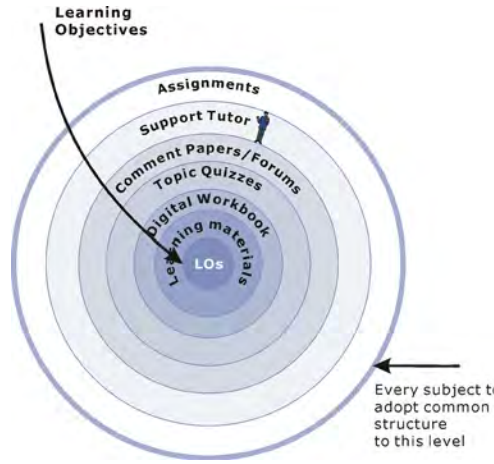


The illustration shows and example of one that animates the statistical Binomial distribution for students, allowing them to explore how it can be modified by changes in its variables n and p. It can be embedded in a web page.

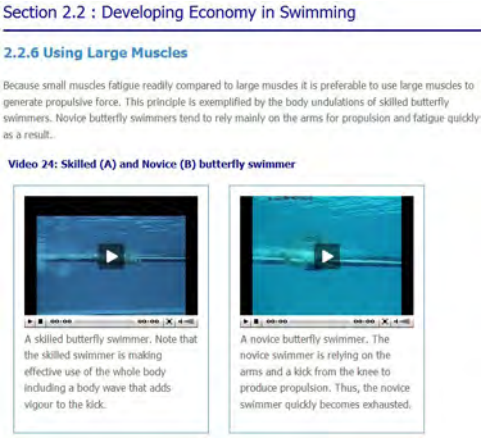
Example Concept Gateway: software object used to study how binomial variations in statistics change when their inputs vary

EXAMPLE CPD DESIGN TEMPLATE

The example continuing professional development template we will look at next is being used by Coachesinfo Limited to deliver continuing professional development in science to professional sports coaches. Coachesinfo is a general resources website for sports coaches and contains hundreds of papers and articles dealing with sport science topics. Each e-learning module is based on a core CPD syllabus part of which is addressed by specific the e-learning "Topics". The components of this e-learning course design can be illustrated as:



The Coachesinfo CPD course design template


Section 2.2 : Developing Economy in Swimming

2.2.6 Using Large Muscles

Because small muscles fatigue readily compared to large muscles it is preferable to use large muscles to generate propulsive force. This principle is exemplified by the body undulations of skilled butterfly swimmers. Novice butterfly swimmers tend to rely mainly on the arms for propulsion and fatigue quickly as a result..

Video 24: Skilled (A) and Novice (B) butterfly swimmer

A skilled butterfly swimmer. Note that the skilled swimmer is making effective use of the whole body including a body wave that adds vigour to the kick.

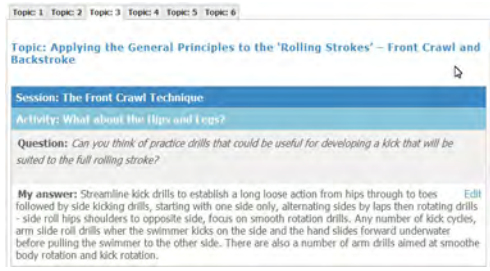
A novice butterfly swimmer. The novice swimmer is relying on the arms and a kick from the knee to produce propulsion. Thus, the novice swimmer quickly becomes exhausted.

The core learning materials are divided into individual topics. Each topic makes use of interactive media elements including especially video clips of sports men and women in practice.

Short single video clips embedded in-line to illustrate a point

Topics are supplemented by comment papers – the latest articles on that subject. These terminate with an inline commenting function that lets coaches record their opinions immediately after reading the paper and share them with other on the course. Other inline interactive objects include Reflections that are saved to a Portfolio database, allowing students to revise them later on, and teachers to see a body of evidence showing that the students have worked through the materials.

Inline activity soliciting students personal reflections



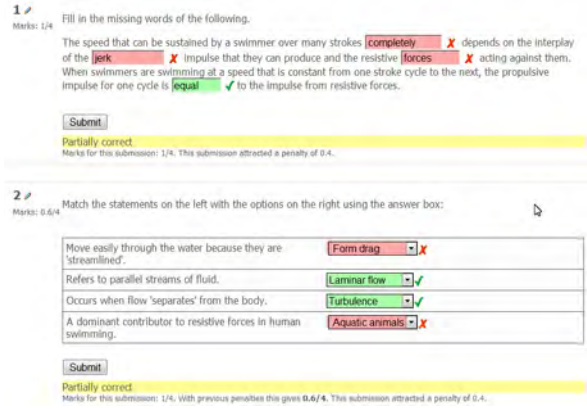
Reflection answers summarised in the student's digital workbook

The deliberate use of personal Reflections, comment papers and general learning environment Forums is an attempt to persuade students – assumed to be minimalist – to interact with the course materials in a personal way, to comment in a restricted way, and to eventually move over to a more social environment respectively. Many students do not choose to be social, so the Coachesinfo course design is an attempt to increase levels of student interaction.

Links to papers within the main Coachesinfo community-of-practice website are also kept current, so students can benefit from the latest research and debate. This is appreciated by students:

> *"Most of the way through the Biomechanics of swimming, down to the major assignment and two smaller ones. Enjoyed it, good info, love the links to articles, very relevant to teachers and coaches. Full funding for the whole programme came through today so you will have to put up with me a bit longer :)"*
>
> *Actual student comment*

The chosen delivery environment is Moodle, and embedded links to end-of-topic assessments (interactive quizzes) and discussion forums are also present in the e-learning materials.



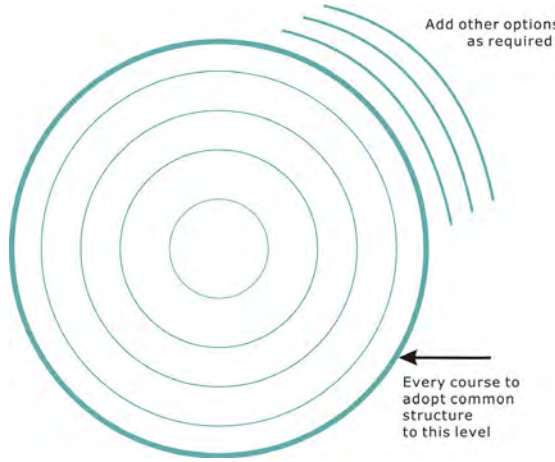
End-of-topic quiz for formative self-assessment

End of study assignments are also Moodle based, and student coaches can upload their assignment papers and videos directly into the e-learning environment for marking by third–party tutors who are paid for marking each individual paper.

Coaches are allocated to individual study tutors but there is not much interaction between them, except for the final assignment or if a problem arises during study. Most of the online interaction is with other coaches through the comment papers and online discussion forums.

START YOUR OWN DESIGN TEMPLATES

The previous five examples of successful e-learning design templates show a range of possibilities and show the value of sketching out the details of your own needs. Use the empty template below to have a go at sketching out your own e-learning course design.



Fill in your own first course template design

- Start at the middle with the most important component of your course design. Where will it fall on the flexible learning spectrum – supplementing face-to-face delivery in some blended way or self-contained for self-study and progression? In other words will it be a person, a set of purpose written study materials, or both?

- Are there a manageable number of clear learning objectives that students can relate to, and which also relate to the assessment outcomes? How important are these to the course – does every other course component need to relate to them?

- Add the next layers for the next most important components to your course. Keep going until you have listed all of the components that must be present. Then draw in the hard outer shell of your design 'onion', outside of which you can then list the optional components you may choose to have for some courses but which aren't necessary for all.

- Once you have the rough outline of your selected e-learning design, put a bit more detail on each of the course components and the purposes they are expected to fulfil. For example: structure the core course content to support online study sessions of 50 minutes or less so that students have natural break-points to return to. Separate out long articles and texts into separate "readers" which students can choose to read offline if they wish. Add extra summaries at the start and end of online topics. Link to discussion forums that are highly relevant to the study context.

- Develop lots of practice assessments and quizzes and make sure the answers are content rich with useful feedback and comments. Link from your quiz answers back into the core learning materials – helping students to address any areas of weakness more quickly.

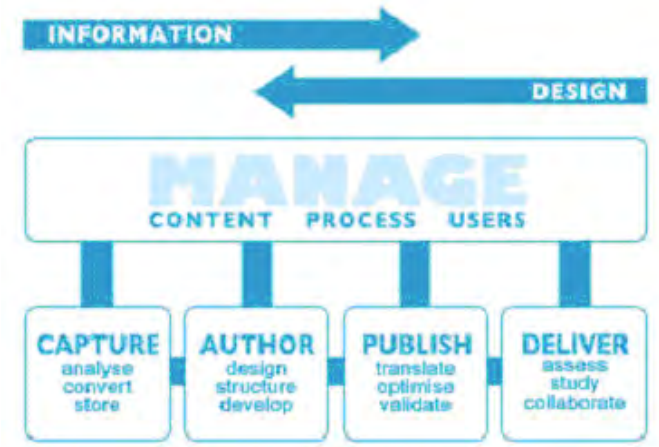
- Spend some time thinking about how you can make your learning content more engaging for online learners. As a general guide; vary your textual materials with interesting illustrations, media and features (tasks, exercises, cross-references), but avoid using unnecessary embellishments such as animations for the sake of motion or 'eye candy'.

- Consider using embedded reflections in the core materials which invite students to comment in a digital workbook. These should never be ignored or thrown away, and digital workbooks can be used for revision later on by the students, added to ePortfolios, or assessed as evidence of study or compliance by tutors or managers.

- Finally, work through your course design with the other stakeholders – authors, developers and learning environment team, and construct a sample to test first before going into full production. Remember to constantly improve them over time by soliciting regular feedback from the students on the effectiveness of the course materials.

CHAPTER 3: SHARE A COURSE PRODUCTION MODEL

When it comes to e-learning course production, it helps greatly if everyone "sings off the same song sheet". One proven learning materials production model that can be used is the **CAPDM Model**, CAPDM stands for "Capture, Author, Publish, Deliver and Manage". It is a generic model of information flow and publishing that focuses on the key processes involved in enterprise content management and delivery, and is particularly useful when developing extensive, or institutional, sets of e-learning course materials that have to be packaged up for delivery in different performance-support environments.



The CAPDM Model – a generic model for publishing

Most course development efforts start with some set of useful materials that already exist but need to be "**Captured**" again into some more reusable form. These are often referred to as *legacy materials* and it is important to decide early on whether it is better to author new ones for the new e-learning media or not.

In the CAPDM production Model, once all the "**Authoring**" is done and the editors are finished checking the core components, all materials are then be mastered using an **open standard format** like XML, and not a proprietary or inflexible one that can only be used for typesetting for print or web pages. Doing this properly underpins great flexibility for future reuse and cost savings and it is best to work with a production team of specialists to do this for you.

Once all the content capturing and authoring is complete, the next step is "**Publishing**" them – converting what has been gathered into specific delivery formats like PDF documents, HTML web pages, RTF Word files or ePub electronic book files. The more flexibility you want to give tutors and students, the more formats you have to create and maintain. This becomes expensive to generate, quality assure and continuously update. This is where the value of using **single-sourcing** and **batch production tools** becomes obvious, as they can quickly generate and re-generate all the output formats you need.

Once you have published your course materials in the multiple-formats that you need, the next step is to "**Deliver**" them successfully on your programme. This might be face-to-face in a blended learning classroom use, or at a distance in print or online where teachers and students use the materials as individuals in a learning environment of their own choice. It is vitally important that the design of the course materials you produce are fit for the intended teaching and learning purposes. Ensuring optimum delivery actually configures the whole publishing process, as each of the capture, author and publish work stages undertaken up to this point are configured and if necessary re-configured to ensure best delivery.

This key need to be **delivery-driven for best quality** (fitness for purpose), should change your perspective on the whole course materials publishing process. It is particularly important for creating e-learning materials and learning environments which can be very expensive to set-up and populate with content.

The final step in the generic CAPDM publishing model is the "**Manage**" one, which simply suggests that it is silly to spend a lot of time and effort creating new course materials in open standards formats, to then abandon or lose them when someone leaves or technologies change. Better to cherish them continuously and evolve them over many years to become highly valuable **assets**. Update them regularly – you can afford to once you single-source. Trace all changes made to them using **revision control**. Track who owns what intellectual property, and ensure all released versions are complete and correct. Reward people who regularly maintain their materials.

The CAPDM model helps with the understanding of the publishing processes used to develop all course materials including e-learning ones. It shows where the use of open standards is appropriate, but it requires developers to be design and delivery-driven. It is also a reminder that the on-going management of the e-learning materials is equally important for long term reuse and benefit of valuable e-learning materials.

CHAPTER 4:
THE IMPLICATIONS FOR EVERYONE INVOLVED

We have looked at how to apply course design templates and open standards to create domains of reusable e-learning materials that can be easily kept up to date and shared by others.

It should also be obvious that this approach is not best suited for individuals wanting to hand craft an e-learning module in isolation. Why? Because creating useful volumes of consistently designed and developed e-learning materials is a *team effort*.

"Surely this is restrictive"? Actually no – the complete opposite in fact. By recognising the team requirement, you can free yourself to concentrate on what you are best at and avoid those things you may struggle to do, usually wasting much time and effort in the process. As part of such a team if you find yourself doing something inefficient, or something you are not confident in doing, get help. Good teams are highly enjoyable to work with, and it is their motivated productivity that makes the cost of good quality e-learning affordable and sustainable.

The remaining sections look at e-learning development from the perspective of the different stakeholders involved in this process. In small projects, one person may undertake multiple roles, but it is important to understand the implications of this new way to produce learning materials for each role.

IMPLICATIONS FOR COURSE DESIGNERS

Most of this chapter was written from the perspective of the e-learning course designer. What it perhaps new is the concept that an e-learning course is designed like a layered "*onion*" -- comprising multiple integrated components around a core of learning objectives with the most important ones nearest to the core. Each design is placed somewhere on a *flexible learning spectrum*, which helps designers to choose the right kind of components for the target e-learning audience.

One of the most difficult challenges course designers and developers face which has not been covered so far is *existing course* or *legacy materials conversion*. There are three main approaches to creating e-learning course materials – use something that exists as it is; substantially re-make something that already exists; or create something completely new.

An "**Integrity**" course development approach means you are going to keep any existing legacy materials essentially as they are, when you reuse them for new e-learning design. Many companion websites for Publishers textbooks use this approach, and it often requires the least effort to complete. Some purists claim that putting books online is not good e-learning design, but they can have a valuable role if their intended use is mostly for browsing, cross-referencing and searching. Students are already familiar with book structures and features, and some, particularly older ones who have already read a lot of textbooks, appreciate their familiarity.

A "**remake**" approach means you are going to significantly change the structure and presentation of the existing materials which will look quite different from their original form.

This usually takes more effort, but can produce new e-learning courses that provide more engaging learning experiences. This work might involve turning chapters into topics and structuring them into chunks that can be more easily managed in a 50 minute online study session.

A "**new**" approach means starting completely from new and involves writing, drawing, animating new materials using their favourite authoring tools. This can be expensive, but if carefully prepared templates are provided by the course designer, they can be used to guide authors to create high quality course components cost effectively.

The new online e-learning media gives course designers many new opportunities to create more effective teaching and learning experiences. There is no single "right" way to do it, but following the advice given here, that has been hard won over twenty years of successful online design experience, should help.

IMPLICATIONS FOR E-LEARNING AUTHORS

Authoring e-learning materials is similar to authoring distance learning materials. What was traditionally delivered face-to-face by the "sage on the stage" now needs to be written in to the materials, either as clear narrative to be read, or in the form of structured guidelines perhaps as a workbook, that guides the students on how to study and be assessed.

Ensuring that the student has all s/he needs to hand in the materials is good distance learning practice. Separate out the essential from suggested readings and references. Establish clear learning outcomes, and use regular learning objectives and summaries to help students to structure their learning, and to gain personal feedback on their study progress.

If you have a lot of text to read, then be sure to provide it in a variety of options that gives students the choice to read off-line in print, on a laptop or on other devices they might prefer. Re-structure it into manageable sessions of 50 minutes or less, and be consistent with how you structure the materials.

The specific exception for e-learning however is the need to exploit new e-learning technologies effectively. Some useful pointers for this are:

- **Use hyper-linking but thoughtfully**. An advantage of online materials is that students can hyperlink – click and jump quickly between different parts of the course materials. Use this feature to link from one section to another, and in particular from the answer you reveal in an online assessment back into the core learning materials at the point the assessment question was assessing knowledge of. Don't overuse it though. Embedding lots of inline links to website and publications outside of your own course, serves to distract students and interrupt their current paradigm.

- **Use multimedia but as individual elements**. There is nothing like a well paced video or audio clip which is immediately relevant and useful. There is nothing worse than watching long videos that are downloaded slowly online and have questionable value in their entirety.

  In the past, video, audio, animation and software enhancements to course materials were expensive and difficult to do and deliver. Today, with camera-phones and video distribution services like Youtube and audio podcasting services, adding media

elements to materials is much easier. They are more reusable too in other uses. Today's video element formats such as MPEG are also standards based making them more long-term. Individual media elements can be added more easily to a learning text than attempting to hand-craft the entire learning text as a multimedia "show".

One note of caution however is that quality counts. Students are already used to professionally produced media clips developed by experts for broadcast use. If you have a whole programme to do, use a specialist video and audio production team or license in good quality content.

- **Record Reflections**. Embed reflections inline in your materials that students can use to quickly record their own thoughts. These should be saved in a digital workbook and used for revision and assessment later on. You can also solicit student feedback through embedding links to message forums and appending comments to papers read.

- **Give regular feedback**. e-learning environments usually provide quick quiz tools that can give immediate feedback on knowledge acquisition. Well crafted computer-aided assessments can also test comprehension, application and analysis, synthesis and evaluation too without overburdening human tutors with the need to mark them. Make sure the answers given are content rich.

All of the e-learning specific features discussed above can be enabled in most modern e-learning environments including Moodle and Blackboard. Authoring the e-learning materials is still achieved using the same choice of authoring tool - MS Word for example. Templates are a useful way to guide the authoring process. Yes - more direction is needed to include media elements and interactions, but rarely is there a need to 'storyboard' the e-learning materials themselves. The authoring concept is still one of multiple and familiar course components centred on the key learning outcomes and objectives.

IMPLICATION FOR COURSE DEVELOPERS

Good e-learning course developers following a C-A-P-D-M model of course production will:

- Apply one architecture and open standards to the e-learning materials they produce for you, and operate one production solution for all media and uses. They work with open standards to prevent lock-in to proprietary vendors and technologies.

- Create single master sources and cherish them. They will avoid any un-necessary duplication of production effort, and may use a digital repository for storage and revision control.

- Be highly efficient and productive: They will work with batch processing tools and be capable of quickly updating and re-releasing your e-learning materials.

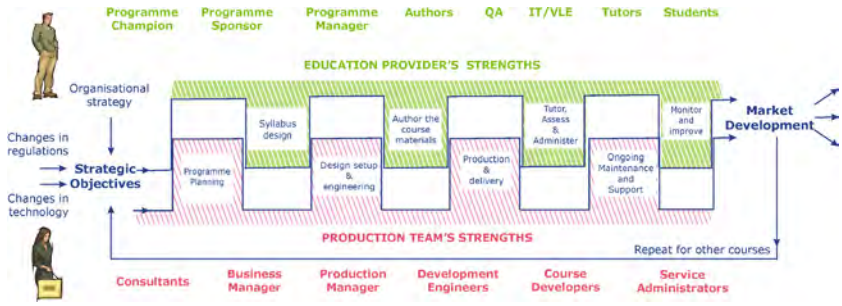
- Avoid Unnecessary Complications. Course developers should not be programmers. If you have a template-based and well constructed production process, the amount of custom programming needed should be zero once everything is set-up.

- Offer more significant help to Authors. Course developers are people who will take your e-learning materials and develop them further with interactivity and meaning

for both teachers and students. They know the limitations and opportunities of your chosen delivery technologies, and are capable of working with you to best exploit them.

IMPLICATION FOR MANAGERS

Designing and producing e-learning materials can be expensive to setup to do first time, and expensive to maintain if done inappropriately. Production managers will therefore appreciate the benefits of sharing an efficient e-learning design and production workflow with designers, authors, developers, teachers and other media production specialists.



Sharing an efficient e-learning design and production workflow

One key decision is whether to resource all production in-house with a complete and well equipped team of course developers, or whether to use external resources or both. It is often better to do both – to have an on-house team capable of cherishing and updating course assets efficiently in an ongoing process, and to use proven external production specialists who have done it before with success, and who can provide all the tools and services needed but cannot be justified full-time.

The key focus for managers developing e-learning material domains is to have a solution that embodies the use of open standards, single-source publishing (one solution all media), and is flexible enough to cope with whatever course designs come along. Good production management will create valuable long-term assets for an institution and a teacher.

IMPLICATION FOR TEACHERS AND STUDENTS

Good quality e-learning courses can save teachers a lot of time and effort if they are designed to support traditional teaching activities with self-study alternatives. They increase flexibility of delivery and help programmes to scale to engage larger numbers of students with new online or distance learning programmes.

The illustration below shows a selection of Teacher oriented functionalities for an ***ifs*** School of Finance service targeted at 300+ secondary schools in the UK. Top left is a teacher only message board, helping them to share best practice and useful files in private. Bottom left shows how teachers can be allocated different types of tutoring roles in individual modules, providing them great self-administration flexibility and the ability to configure the teaching environment themselves.

The illustration top and bottom right show summary reports auto-generated for teachers that show how a class is getting on with their e-learning progress and assessments. Individual student test attempts and scores can be selected and browsed.

Teacher-oriented features in an *ifs School of Finance* e-learning environment for schools

Students appreciate working with more engaging learning materials that offer them personal learning experiences and can be studied at their own pace and place. Well design courses also have a higher level of integration and consistency that is rarely achieved across a whole programme of different subjects. This improves familiarity with the materials and offers new online features such as search to aid study.

Full-text searching of content-rich courses including assessments

CHAPTER 5: CONCLUSION

Designing for e-learning means change but not as much as you may think. Authors still author using familiar tools, but they need a new focus, templates, examples of good online practice and technical support. Developers use different tools (XML based ones) and a different single-sourcing perspective, but are rewarded by greater flexibility and productivity. Programme managers get greater flexibility and strategic new course and production team assets. Teachers and students get more flexibility and freedom to spend more time with other course participants.

Does this liberate teaching? Yes, if done well using good designs, templates, good team support sharing a common workflow, open standards formats and a long-term asset-building domain perspective.

Does it restrict? The real-world examples discussed in this chapter suggest that this is not the case.

SECTION 7

OPEN EDUCATIONAL RESOURCES

A SHORT GUIDE TO THE PRODUCTION AND SHARING OF OPEN/FREE LEARNING OBJECTS

Abstract

This chapter is based on the results of the SLOOP project – Sharing Learning Objects in an Open Perspective – which has promoted the sharing and the co-operative production of digital learning resources following the model of free/opensource software.

The chapter introduces the "open" philosophy/model which has been successfully adopted in the field of software development; it presents the general "Open Educational Resources" (OER) concept and the features of a specific implementation of the OER concept, called Open Learning Objects; then, it illustrates the Learning Object standards and examples of Learning Object repositories.

The aim of the chapter is to highlight the opportunities, for schools and teachers, of a co-operative approach in producing and sharing Learning Digital contents to enhance learning and to make it more attractive by integrating online and face-to-face learning.

CHAPTER 1: THE OPEN PHILOSOPHY

Two different tendencies lock horns: “to open” or “to close”? Shall we facilitate and encourage access to resources – to land, to water, to medicine, to information, to ideas, ... - or shall we limit it to protect legitimate interests, ownership rights, patents, the right to privacy, the ownership of an idea?

It is an old story that acquires new and different aspects in the digital and globalized world. Let’s think of the patent field: there are many famous cases such as the Indian government against the RiceTec company which patented, by the US Patents Office, Basmati rice and the one of the multinational pharmaceutical companies against the South African government for below cost selling of anti-AIDS medication. Recently, in order to denounce how the industrial and technological management of patents don’t hold water, a young Australian lawyer, John Keogh, has announced that he has registered a patent for a circular transportation facilitation device: the wheel!

Let’s think, on the contrary, of the possibility that anyone, who has a computer and internet access, can make gigabytes of music, texts, films and programmes available to everyone without geographical, time and economic constraints apart from connection costs. Just not to mention the possibility that everyone has to publish their own ideas, their own photographs, their own films and make them available to everyone.

In recent years the move to openness in the software industry has achieved a relevant success. The free/open-source software model – free use, distribution and modification thanks to the availability of the source code – has been spreading and has already got a significant slice of the market showing that an “open” strategy can produce economic results.

The fact that the software is free/open is not simply a matter of rights. Linux is different to Windows not only in freedom to use, distribute and change but also in how it was developed. Linux was not created, as a cathedral, on the basis of a centralized project but according to a model that looks like a large and bewildering bazaar with the motto: “release early and often, delegate everything you can, be open to the point of promiscuity” [Raymond, 1998].

This open software is proved to be reliable, often more reliable than proprietary software. A proof of this is the open-source software Apache, that is the most popular with over 70% share in the field of web servers. The motivation for openness and collaboration – people use it, people adapt it, people fix bugs – has been shown to be correct.

However, combined with the motivation for efficiency it is worth remembering the main initial propelling force to develop free software is freedom: software is part of knowledge and knowledge is a right that cannot be limited.

The idea has rapidly crossed over the software industry. Extremely important is the adoption of similar approaches in the educational sector, as the related concept of Open Educational Resources.

CHAPTER 2: OPEN EDUCATIONAL RESOURCES

THE ORIGIN OF THE CONCEPT

At the conclusion of the 2002 *Forum on the Impact of Open Courseware for Higher Education in Developing Countries*, organized by UNESCO, the participants expressed their satisfaction and their wish to develop together a universal educational resource available for the whole of humanity, to be referred to henceforth as Open Educational Resources.

The idea was to promote an open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes.

Since then, a movement of thought that considers necessary **to allow everyone to get free access to the knowledge for educational purposes has developed.**

However, only in 2007, following the publication of 3 important documents on this subject, the importance of OER has become central to the political agenda of many countries worldwide:

- Giving Knowledge for Free: The Emergence of Open Educational Resources [OECD 2007]
- A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities [Atkins et al. 2007].
- Open Educational Practices and Resources: OLCOS Roadmap 2012 [Geser 2007].

Following these publications, the **Council of Europe** has specifically mentioned the strategic importance of policies that promote the adoption and development of OER in the school system, and even the **United Nations** have highlighted the strategic value of OER[1].

There are many implementation solutions of the “Open Educational Resources" concept. We report here two exemplary cases.

In 2002 Massachusetts Institute of Technology launched the **MIT OpenCourseWare** which would allow all their course materials available on the Web under a copyleft license: Creative Commons *Attribution, No-commercial, Share alike* (you are free to use, distribute, change for non commercial use owing that the original author is credited and all derived material could be used under the same license).
A year before **Wikipedia** was born: using *wiki* software, people collaborate to the creation of a free encyclopedia, adding, deleting and modifying the content. Differently from the MIT project that makes material which has already been produced available, Wikipedia adopts and transfers the “bazaar” model of Linux to the production of content, fostering quality content by everyone’s “responsible” participation.
In 2005 a survey carried out on the behalf of Nature journal has compared the mistakes and inaccuracies present in Wikipedia with the ones in the prestigious Encyclopaedia Britannica and the conclusion was that both encyclopedias contain mistakes in the same way [Giles 2005].

1 An in-depth analysis of the relevance of OER for the international policies can be found in "*Open Educational Resources. The Way Forward. Deliberations Of An International Community Of Interest*" [D'antoni 2007]

Cape Town Open Education Declaration

The importance of "opening" education has been central to several debates around the word. These debates have produced important strategies to increase the open education concept. Amongst other, it is valuable to mention the *Cape Town Open Education Declaration*. The Declaration arises from a small but lively meeting convened in Cape Town in September 2007. The aim of this meeting was to accelerate efforts to promote open resources, technology and teaching practices in education.
Convened by the Open Society Institute and the Shuttleworth Foundation, the meeting gathered participants with many points of view from many nations. This group discussed ways to broaden and deepen their open education efforts by working together.

Participants to the meeting have produced the **Cape Town Open Education Declaration**. *"It is at once a statement of principle, a statement of strategy and a statement of commitment. It is meant to spark dialogue, to inspire action and to help the open education movement grow. Open education is a living idea. As the movement grows, this idea will continue to evolve. There will be other visions initiatives and declarations beyond Cape Town. This is exactly the point. The Cape Town signatories have committed to developing further strategies, especially around open technology and teaching practices"* http://www.capetowndeclaration.org/

The Cape Town Declaration can be accessed at http://www.capetowndeclaration.org/, where the list of individual and organizational signatories is reported, and where the Declaration can be signed.

CHAPTER 3: THE OPEN PHILOSOPHY FOR THE PRODUCTION OF OPEN LEARNING CONTENTS

THE SLOOP PROJECT

In 2005, ITSOS Marie Curie promoted the SLOOP project - Sharing Learning Objects in an Open Perspective – co-funded by the EC under the Leonardo da Vinci Programme 2005 (www.slooproject.eu).

According to the previous considerations, at that time models for a collaborative production of software and learning content had been coming out and the open/free model seemed to be the answer to the problem that many of the SLOOP partners had encountered in their e-learning experiences.

In fact, the organizations promoting the SLOOP Project have been active for many years in the e-learning field starting from their own specific mission: face-to-face learning, distance learning and pedagogical research.

During their activities and in previous European projects, these organizations had come to the following conclusions:

- When compared to traditional distance training, e-learning, in the sense of on-line training, does not only facilitate access to learning material and communication between learners and tutors, it also allows the creation of a work environment where the trainee can interact with the peer group and with the teacher/tutor eliminating the feeling of isolation and increasing the value of collaboration.
- E-learning can be successfully integrated into face-to-face training. It allows material to be supplied to students for home study/work and to increase the possibility of interaction with teachers and between learners outside the school timetable and outside the school walls thanks to the virtual environment.
- Producing good on-line didactic material requires both the capacity to transfer good teaching practises from face-to-face training to on-line training [Ó Súilleabháin 2003] and the ability to exploit IT potential in order to develop interactive material allowing learning “by discovery” and “by playing” [Berengo 2003].

Teaching material had been recognized as the critical point: producing different types of teaching material specifically designed for the Internet, for example interactive lessons using multi-media, simulations and tests are very time consuming and an onerous task. The required resources are more than those available at most schools and universities [Ravotto 2003].

Why not share learning objects that are already available on the teachers and students hard disks [Wiley 2000a]?

Why not share the teaching material which have been produced in the last 10 years thanks to the efforts of one individual teacher or with resources made available from schools or from local, national or European Authorities?

Having this in mind, the SLOOP project aimed at **promoting a community of teachers for the collaborative production and sharing of open/free digital educational resources.**

Even though the term "Open Educational Resources" had been coined in 2002, when the Sloop project started, the term was not so popular, and it was not adopted in the Sloop project, since very few people would recognise it.

On the contrary, the Learning Object concept was well known in the educational settings, and in order to include the main principles of OER, we defined the concept of ***Open*** Learning Object:

Starting from Wiley's definition of learning object [Wiley 2000b], we defined **Open Learning Object** as *"any open digital resource that can be reused to support learning"*. In this definition the term *open* indicates **open content**, namely content developed in open format (e.g. Open Document) or content in a closed format whose source files are also available (e.g. Adobe Flash). In addition it refers to **open licenses** (e.g. Creative Commons) thus allowing users to freely modify and reuse learning objects [Fulantelli et al., 2008]

From our experience and from the one of the open source/open content movement, we had deduced that the following 4 elements are necessary to share educational resources through the Net:

- a community which is interested in sharing resources,
- the will and possibility to guarantee freedom to use, distribute or modify material,
- the will and possibility to make the material interoperable - transportable from one environment to another - and changeable,
- an environment where to share such resources.

The next section provides a more detailed definition of Learning Objects (LO), which highlights the opportunities, for a community of teachers, of a co-operative approach in producing and sharing Learning Objects. Sections 5 and 6 describe

how specific international standards (SCORM and IEEE LOM) make it possible to build LOs that can be used in different Learning Management Systems and describe Learning Objects in such a way that they can found in the Net, wherever they are stored. These are examples of standards that guarantee interoperability and promote reusability of Learning Objects.

Section 7 illustrates the Creative Commons, an example of copyleft licenses, that allow Net users to freely share resources, by specifying restrictions for reuse or modifications.

Finally, section 8 provides a short guide to the Open Educational Resources which allow communities of teachers to share Learning Objects.

CHAPTER 4: LEARNING OBJECTS

DEFINITIONS AND CHARACTERISTICS

WHAT EXACTLY IS A LO ? HAVE WE EVER PRODUCED THEM?

A universally accepted definition of LOs does not exist. But, on the other hand, does a definition of **lesson** exist?

There are several alternative terms and interpretations on the nature and size of a LO, as it happens with other concepts such as "learning objectives", "evaluation"……

Nevertheless teachers have not renounced to plan and deliver classes, to define objectives, to evaluate….

The term Learning Object (LO) was introduced by Wayne Hodgins [McGreal 2004] who transferred the concept of Objects from IT to training /education.

In IT programming objects are produced which can be reassembled and reused in different contexts. Similarly these “learning objects” can be used in the training field where they can be reassembled and reused according to different teaching and learning situations.

Since the beginning metaphors have been used to describe and simplify the characteristics of LO. In recent years a lively debate has developed between elearning experts and different definitions of a LO have been coined. These definitions are linked to the context used and the educational models.

Following, you find some of the most popular:

- any entity, digital or non-digital, that may be used for learning, education or training [EEE, 2001],
- anything and everything can be used for learning and therefore must be considered to be a LO [Downes, 2003],
- any digital resource that can be reused to support learning [Wiley, 2000b],

All teaching material which is developed by teachers, and which is more and more often in digital format, can, to a certain extent, be considered as learning objects.

Wiley writes when discussing students and university faculties: *"Students have all kinds of educational material (learning objects) lying around their hard drives: essays, term papers, other types of homework, notes taken during lectures, etc. ... the same is true for faculty. Faculty have all kinds of material lying around their hard drives as well: syllabi, lecture notes, research instruments, data sets, articles in progress, articles never published, etc."*

The same is also true for all teachers whether at university level or not. By checking through the teaching material that we have on our hard drive, we can see that much of this material has already some of the typical characteristics of LOs and that, with a little work, such material can be changed so that it can become a proper LO.

In simple terms and taking into account shared elements we can say that a Learning Object is any digital resource which supports learning:

- it corresponds to a definite, single training objective,
- it stands alone,
- it can be reused,
- it can be assembled,
- it provides information (called metadata) which allows it to be retraced and used.

A deeper understanding of the different meanings associated to the Learning Object concept can be found in *Learning Objects: A Practical Definition* [McGreal, 2004]

WHY LEARNING OBJECTS?

The use of new technology has become an integral part of teaching and many teachers are increasing the use of the Internet as a vehicle to transfer. One of the consequences of this is the growth of interest in LOs for many different reasons:

- The concept of modularisation of learning paths is usual procedure and is consolidated in the community of teachers and educators.
- The possibility of finding LOs create the conditions so the teacher's work can be focused on quality rather than quantity.
- While re-assembling LOs it is possible to build flexible and personalised learning paths.

Also the idea of transferring the logic of programming by objects to the didactic process brings an "economic" motivation: avoid the waste of resources to redo something which has already been done. If it is possible to produce or change single blocks which can be adapted to different teaching contexts then costs are considerably reduced and the available resources can be used to improve the material.

CHARACTERISTCS OF LOS: REUSABILITY

The reason for using LOs is in their potential to be **reused**.
Material is “reusable” when even if it is conceived for a specific context it can then be **utilized in a different context**, when a large number of people have **access** to it, when it is possible to use it **independently** from **the technological choices** (software rights, platforms etc.) used by the author, when **it is possible to change it** easily so it can be updated and adapted to different contexts.

What are the **characteristics** which a LO must have so that it can be reusable?

- **Assemblability**
  A LO is an object which can be used **together with other LOs** to build **different learning paths** in different contexts.

- **Accessibility**
  In order to use the material, first of all, it is necessary to know that it exists. As in a library a book is catalogued and found thanks to the bibliographical information which accompanies it, also a learning object needs to be traceable due to the information which relates to its characteristics (title, author, history, format, pedagogical characteristics, ...). These indications are found in the metadata, that are descriptions relating to the contents which facilitate the research and allow the creation of a system of repositories where each object can be found.

- **Granularity**
  The ability of a LO to be divided is related to its size.

"**Granularity**" and **context** are linked in a way which is inversely related to proportion/ size. The more a LO is put into context the less it can be divided and the "smaller" the LO is the context becomes less important.

The possibility to divide and reuse a LO are linked. On one hand a LO, where the possibility to be divided is reduced, can be reused in different contexts with great difficulty. On the other hand also a LO which can be divided easily and that can, as a consequence, be used in more contexts, would need the intervention of a teacher who must create the context. This is, after all, a limit to the LO reusability.

- **Adaptability**
  A LO must be easily changed in order to be adapted to a new context. In order to do this the following must occur:
  - **availability of the source** (possibility of changing it),
  - a **copyleft licence** (the right to change it)**,**
  - **simplicilty** of the object (one of the conditions so that the change would be cost effective).
  -
- **Self-consistency**
  A LO should be able to be used on its own or rather it should not be part of an organised sequence of LOs. It should also be "complete" from a didactic point of view and achieve the objectives established by the content producer. This implies, among other things, that one LO should not refer specifically to another LO and also it should not contain links that lead out of the LO itself

- **Interoperability, portability, compatibility**
  A LO should be able to be used with any operating system and should be able to be visualised by the user with any browser.

  Also the LOs should be able to "**speak with**" different didactic **platforms** in order to be able to communicate information relating to the progress of the student in the learning path.

- **Flexibility**
  Flexibility, in the context of LOs, is used in two slightly differently senses:
  - material which is prepared to be used in **different contexts** is more flexible and easier to reuse than material prepared for a specific context,
  - in a strictly technological sense the material is flexible if it can be used with a normal browser, any operating system and **does not need any specific software or plug in** to be visualised or changed.
  -
- **Durability**
  Durability concerns the ability to adapt to future technological changes such as the continuous evolution of the **platforms**.

CAN THE REUSABILITY PROMISE BE FULLFILLED?

The following table sums up the main arguments pro and against the reusability of LOs, which have been raised in the long-lasting debate on the real effectiveness of LOs. Arguments are presented in relation to the characteristics of the LOs.

	Pro	Against
COMPONIBILITY, ADAPTABILITY AND SELF-CONSISTENCY	Didactic material which is specifically prepared to be used in many contexts can then be reused with small changes much easier than material which was developed for specific contexts.	The context and the meaning of a learning object are inter-linked. Reusability is often limited (even for relatively simple objects) due to the need to change or personalise and can be difficult when the object is removed from its context
INTEROPERABILITY AND FLEXIBILITY	The independence from the operating system and from the LMS allows to empower the possibility of sharing chunks of teaching material in an unlimited way.	The large number of models, which are also very different one from another, inhibit the real portability of digital didactic material.
ACCESSIBILITY	It facilitates the ability to update, research and manage the content due to the metadata which filter and select the data which are relevant	Difficulty in editing/ interpreting the metadata because there isn't a standard of shared meaning; different people use different terms to describe the same documents even if they must choose within a controlled vocabulary.

CHAPTER 5: SCORM EXPLAINED TO TEACHERS

SCORM - *Sharable Content Object Reference Model* - is a collection of standards and specifications adapted from multiple sources to provide a comprehensive suite of e-learning capabilities that enable interoperability, accessibility and reusability of Web-based learning content.

Specifically, SCORM defines technical rules to:

- create interoperable, accessible and reusable learning contents,
- create searchable content or content repositories
- control how online learning content and Learning Management Systems (LMSs) communicate with each other (for example, to keep track of learner progress).

SCORM has been developed by the ADL Initiative, etsablished by the U.S. Department of Defense in 1997.

The ADL Initiative created an international community to collaboratively develop a cost-effective distributed learning model that is consistent across national and organizational borders. To achieve this goal, ADL worked with the Institute of Electrical and Electronics Engineers (IEEE), the Aviation Industry CBT (Computer-based Training) Committee (AICC), the IMS Global Learning Consortium, Inc., and the Alliance of Remote Instructional Authoring & Distribution Networks for Europe (ARIADNE). These organizations develop guidelines and specifications that make learning software accessible, interoperable, durable, and reusable. Whenever possible ADL adopts, clarifies, harmonizes, synchronizes, and applies the documentation that these standards organizations develop. ADL promotes the application of standards with reference implementations and tools to assess compliance to the requirements (Source: Advanced Distributed Learning Initiative)

WHY IS SCORM RELEVANT FOR TEACHERS?

The essential elements for an elearning course are:

- **people** (teachers, tutors, learners, and so on),
- a **pedagogical model** behind the organization and management of the course,
- **digital contents** (Learning Objects/Educational Resources),
- a **software platform** to run the course, also called Learning Management System or Virtual Learning Environment (e.g. Moodle).

SCORM addresses the last two elements. Specifically, if we do not use a standard to produce Learning Objects (like SCORM), we risk that:

- LOs produced in a proprietary format (not compliant to a standard) can be only used with those LMSs that can “launch” and exchange data with LOs developed in that specific format.
- LOs produced in a specific LMS cannot be used in a different one; for example, we cannot (straightforwardly) export learning contents produced in Moodle to Docebo (another LMS).
- It is almost impossible to create searchable content or content repositories.
- Reusability of Learning Objects is strongly limited by their proprietary format.

On the contrary, by adopting SCORM:

- an LMS can launch LOs produced by different software and exchange data with them;
- different LMSs can launch the same LO and exchange data with it.

Referring back to the initial question – "Why is SCORM relevant for teachers?" - we think that whoever is involved in the production of contents for elearning programs should be aware of the **potentials offered by the adoption of a standard like SCORM**; amongst others, the possibility to track learner progress, to search for Learning Objects on the Net, to develop reusable and interoperable LOs, …

WHAT SHOULD TEACHERS KNOW ABOUT SCORM?

SCORM is a set of technical standards for e-learning software products. We strongly believe that teachers should be users of the SCORM, and not expert of it (unless for personal or professional purposes, of course!).

This means that teachers should learn how to use software products that allow them to author learning contents in a simple way; all the technical steps necessary to save the content in the form of SCORM-compliant Learning Object should be done automatically by the software in a transparent way. *eXelearning* and *Reload* are two examples of these software products.

Nevertheless, we think that some basic concepts of the SCORM should be learned as well, since these software products refer to the SCORM terminology for some operations. *Assets, SCO, Content Aggregation, Packaging* and *Manifest* are terms which are normally used in the SCORM world.

The aim of this section is therefore to provide the elementary concepts necessary to understand the basic SCORM terminology.

WHAT IS THE MAIN BENEFIT OF ADOPTING SCORM?

There are numerous benefits to adopting SCORM, and all are related to ADL's functional requirements for SCORM.

- **Accessibility**: The ability to locate and access instructional components from multiple locations and deliver them to other locations. For example, a content author can search the ADL Registry and identify relevant content that has already been developed by another organization and deploy that content on any LMS that complies with the same version of SCORM to learners anywhere in the world.
- **Interoperability**: The ability to take instructional components developed in one system and use them in another system. For example, content packaged for delivery in one SCORM-compliant LMS could be loaded into another LMS that complies with the same version of SCORM for delivery to learners.
- **Durability**: The ability to withstand technology evolution and/or changes without costly redesign, reconfiguration, or recoding. For example, upgrading to a new computer operating system should have no impact on the delivery of content to learners.
- **Reusability**: The flexibility to incorporate instructional components in multiple applications and contexts. For example, e-learning content designed for one organization can be redeployed, rearranged, repurposed, or rewritten by other organizations that have similar learning needs.

(Source: Advanced Distributed Learning Initiative*)*

Accessibility, Interoperability, **Durability** and **Reusability** are also known as the "-ilities" of the SCORM.

> *One important note: in the last few years, the term "accessibility" is more and more used to focus on people with disabilities and their right of access to entities. This shouldn't be confused with the more general definition of accessibility, which is the one reported in the SCORM specifications.*

INSIDE SCORM - KEY CONCEPTS

The **SCORM 1.2 version** has three parts:

1. **Overview**. General information on the model, vision and future of the standard
2. **Content Aggregation Model (CAM)** - how to put learning content together so it can be moved and reused. It is a group of specifications which define components, metadata, and how to produce content packages that can be used by a LMS and stored in a repository.
3. **Run Time Environment**: How content is launched and the learner's progress is tracked and reported back.

It is the set of specifications to trace the activities, in particular to activate the communication between a SCO and a LMS, to exchange data and to finish up the communication.

In the **SCORM 2004 version**, a fourth component has been added:

1. The Sequencing and Navigation Specification
   It specifies how the learner can navigate between parts of the course (SCOs).

> *The most recent version of SCORM is SCORM 2004 but currently the SCORM version 1.2 is more used.*

CAM - COMPONENTS OF A LO

The Content Aggregation Model, CAM, defines a powerful model for breaking content into arbitrarily sized units of reuse. These units are called Sharable Content Objects (SCOs) and Assets.

In SCORM terminology:

- ***Asset***
  An electronic representation of media, text, images, sound, web pages, assessment objects or any other pieces of data that can be delivered to a Web client
- ***SCO (Sharable Content Object)***
  A SCO is a collection of one or more assets and other SCOs that represents a logical unit of learning.
  It is the smallest learning resource that can be tracked by a LMS (via javascripts functions included in the SCORM). Single assets cannot be tracked by a LMS.
  SCOs cannot launch another SCO as this is a proper function of the LMS .
- ***Content Aggregation***
  It is an "aggregation map" of assets and SCOs that represents a learning unit (a module, a course, ...).

> *The definition of a SCO is deliberately vague; it can be a single web page or a web-based training module containing hundreds of pages, images and other assets. The definition of a SCO is left up to the content author. Each SCO should be universally reusable.*

CAM - METADATA

Metadata describe what the content is, who owns it, what costs (if any), technical requirements, educational purpose, etc.

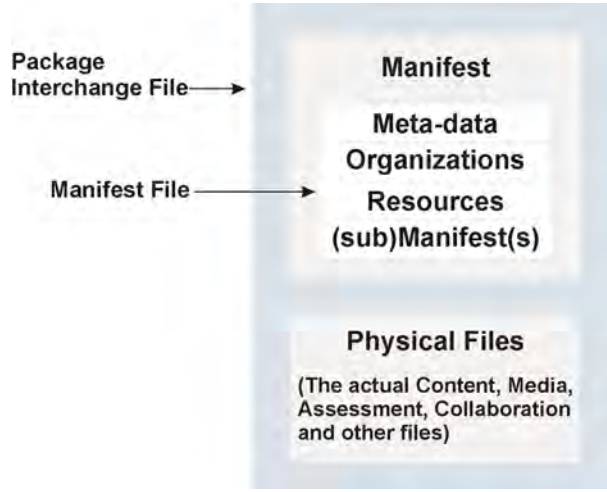
Metadata tags provide information about content to help search for and discover content over the Internet or within content repositories.

In fact, the CAM also defines how to code the tags in machine (and human) readable formats (via XML).

CONTENT PACKAGES - PACKAGING

Content Packages contain a collection of learning objects, their metadata, and information about how the content is to be delivered to the user.

Packaging consists of "zipping" all relevant files together with an XML "**manifest**" that defines all of the contents and their relationship to one another (even named ***imsmanifest***, since it is conform to the specifications defined by the IMG Global Learning Consortium).



Source: ADL: The SCORM Content Aggregation Model - Sharable Content Obejct Reference Model, version 1.2

Within the manifest, there is a so-called "**organization**" that defines the structure of the overall learning experience. The LMS uses the organization to determine what to deliver and when.

Content packages can then be imported and exported to Learning Management Systems or development tools, and they can be therefore exchanged between systems in a standardized way.

THE RUN TIME ENVIRONMENT

It is the set of specifications to trace the activities, in particular to activate the communication between a SCO and a LMS, to exchange data and to finish up the communication.

In this context, "**communication**" refers to the exchange of data between the LMS (e.g. Moodle) and the Learning Object which is accessed by a student in the LMS.

For example, whenever a learner accesses a SCORM-compliant Learning Object in Moodle, the Run Time Environment **launches** the SCOs in the LO, and Moodle records some events related to the learner: day and time of access, which parts of the LO the learner has accessed, time spent on each part, grades of tests in the LO, and so on. This process, which is named **tracking**, is possible only because the LO and the LMS exchange data.

SEQUENCING SPECIFICATIONS

The sequencing specifications allow the content author to govern how the learner is allowed to navigate *between* SCOs and how progress data is rolled up to the course level.

Through these specifications, it is possible to define prerequisite constraints, create optional sections, provide question weighting, activate remediation mechanisms.

FINAL REMARKS

SCORM is a model to produce LOs which are **interoperable** and therefore reusable. This model is becoming the ***de facto standard*** regarding the **communication rules** between the LO and the platform (LMS) and the **packaging** of LOs so that they can be transported between a repository or a platform to another.

Any teacher who wishes to develop content for eLearning only needs to know what SCORM means. The platform and content tool developers should worry about conforming to SCORM. The teacher's role is and will be related to **pedagogy** .

Many teachers have enough ICTs skills to develop their own content in the form of web pages. In this case they will easily insert into their web pages the few lines calling the files containing the necessary javascript to make them SCORM compliant.

It will not difficult for them either to use software like *Reload* that allows content aggregation, the insertion of metadata and the production of the package.

CHAPTER 6: LO METADATA EXPLAINED TO TEACHERS

"If a tree falls in a forest and there's no one there to hear it, does it make a sound?"
"If a digital resource is in a database but can't be found, is it really there?"

Paul Shabajee, A Fundamental Dilemma for Developers of Multimedia Archives

WHAT DO WE MEAN BY LEARNING OBJECT METADATA (LOM)?

Learning Object metadata are **elements** describing a learning object; they provide information on the author, the content, the target and the conditions of use of the learning object.

They are necessary to describe and classify each LO and to allow the users interested in that specific content to search for it.

Actually metadata constitute the **identity card** of the learning object, as we can see from the example given below.

Thanks to metadata it is possible:

- to research on-line LOs meeting one's own need,
- to know the conditions of use of a LO for example if such material is protected by copyright,
- to find out links to other LOs in order to build a learning path

Metadata are not necessarily static, but on the contrary they can be updated using the experience of users. From a technical point of view, metadata can be linked to the resource/learning object directly **inside** the resource itself (e.g. using META tags of an html document), or **outside** the resource (as the cards describing the books in a library, which are stored separated from the books). In the latter case, metadata databases (repositories) can be located on one or more servers and contain links to the location of the resource, which can be physically located on a different server.

WHAT ABOUT THE CHARACTERISTICS OF LO METADATA?

Metadata are:

- Data that are **strongly structured** according to a predefined scheme. Owning a structure means that the data are catalogued according to a predetermined scheme that bases itself on **shared standards**.
- They are **organised in tables.** Such tables are made up of columns the headings of which constitute the scheme and their subheadings provide the scheme specifications. The different headings highlight the different descriptive categories and allow to search according to the fields chosen.
- They are written in **XML** (eXtensible Markup Language), a language that can be read by databases and that can provide descriptions of the resource. It is extensible, independent from the platform used. XML files are text files and one of the advantages of the textual format is that it allows the information given to be read without the aid of the programme that has created them.
  The current research focuses on the evolution of the present Web in the Semantic Web and on the definition of different levels for representing knowledge and the relevant languages to express it.

The **metadata** can be grouped under three categories according to the functions they perform:

- **Descriptive metadata**. To search for, to identify, to select.
- **Administrative metadata**. To manage the digital objects of a collection providing their acquisition, storage and use according to the conditions of a possible copyright/ copyleft licence and to certify the integrity and authenticity of the resource.
- **Structural metadata**. To link the several components of the resources to make them fully and adequately used.

Metadata can be **objective** (e.g. title, date creation) or **subjective** (e.g. semantic density) if the information is derived directly from the described object or obtained from the evaluation or point of view of the person compiling the description

Several international organisations have devised metadata standards, such as **Dublin Core Initiative** and **IEEE/LOM**.

WHAT ARE THE STANDARDS FOR LOM?

There are many different organizations involved in the creation of standards for metadata. The standards are based on a thesaurus (a controlled vocabulary) which contains key words to describe a LO in terms of content and discipline. This allows any user to retrace the LO and helps to identify:

- **the author of the LO**
- **the date of the LO**
- **potential target of users**
- **the software used to produce the LO**
- **the format of the LO and where it would be used**
- **links with other documents**

The compilation of the metadata fields is up to the author, but some of these are automatically compiled by the system. **Dublin Core Metadata Initiative -DCMI** and **IEEE/LOM- 2001** are the most important initiatives that have provided largely used standards.

DUBLIN CORE METADATA INITIATIVE (DCMI) - 1999

One of the first organisations involved in metadata was Dublin Core. This organisation takes its name from its location in Dublin Ohio where the first working group was established. DCMI proposed a standard which concerns the description of the resource which is presented on the web (therefore also non didactic).

It is characterised by a **minimalist approach**, with few descriptors which are easily understood and can be adapted to a wide range of resources.

This represents the departure point of successive developments up to current research concerning the semantic web.

The Dublin Core Metadata Element Set (DCMES) is made up of **15 elements** which can be grouped under three main headings:

CONTENT	INTELLECTUAL PROPRIETY	CHARACTERISTICS
- Title - Subject - Description - Source - Language - Link - Cover	- Creator - Contributor - Rights	- Date - Type - Format - Identifying features

As far as the educational field is concerned DCMI provides very few indications on how to use the resource and it suggests adding other elements such as the educational level of the user and the instructional method employed in the development of the resource.

It is, nevertheless, an adaptation as the Dublin Core Metadata Scheme is mainly devised to describe any kind of online resources.

IEEE/LOM- 2001

In 2001 the Institute of Electrical Electronics Engineers developed a standard based on the smallest collection of attributes which were necessary to manage, locate and evaluate didactic resources.
The standard comprises 9 categories which can be broken down into approximately 70 fields.

The following table lists the 9 IEEE/LOM categories:

N.	CATEGORIES	FIELD No.	DESCRIPTORS
1.	**General**	11	It provides general information on the resource, for example an unambiguous identifier (URI, ISBN, DOI etc.), the title, the language, the description, the time and space used and the structure of the resource (atomic, branched, collection, networked, hierarchical, linear, mixed, parcelled).
2.	**Lifecycle**	6	It provides information on the history and evolution of the resource, the date of its creation and editing, the version, the primary and secondary contributions etc.
3.	**Meta-metadata**	9	This category provides information on the scheme of metadata adopted, the author of the standard, the language of the scheme (that can be different from the one of the resource), its format etc.
4.	**Technical**	12	This category describes the technical requirements and characteristics of the resource (format, size, technical specifications, duration etc.)
5.	**Educational**	11	It provides information on the educational or pedagogic use of the resource. This category is of major interest for teachers and developers' communities.
6.	**Rights**	3	It provides information on the intellectual rights of the resource, copyright matters and conditions of use.
7.	**Relation**	7	It provides information on the relationship between one resource and another, if one exists; it is a useful strategy to discover relationships with other resources; in fact it is not possible to do this within the resource/learning object because being self-consistent, a LO can't contain links to any other resources.
8.	**Annotations**	3.	It provides comments on the educational use of the resource, and information on the author and the date of comments; it differs from other categories as it is reserved for users, evaluators, etc.
9.	**Classification**	8	It provides information on the theme or subject dealt with in the resource. In case of free key words it is necessary to specify the relevant semantic context, for example the Dewey Decimal Classification(DDC), the Library of Congress Classification (LOC) or the European Educational Thesaurus (EET o TEE).

IEEE EDUCATIONAL METADATA

In the context of training in order to make Learning Objects traceable according to different didactic strategies, they must be described by a set of metadata which include a specific educational field . The IEEE/LOM responds to this necessity since it gives descriptions based on many headings including pedagogy.(category 5). According to the standard IEEE/LOM the **key educational characteristics of a Learning Object** are:

5.1 - Type of interactivity	**Active, expository, mixed LO.** This description allows us to distinguish between a LO which requires "active" participation from the student (exercise, simulation, problem solving) or simply reading a text (including hypertext) or viewing multi media material. The third type of LO can contain both an expository part and an active part.
5.2 - Type of resource	To be chosen within a **controlled vocabulary** including exercises, simulations, questionnaires, exams, lessons and others with the possibility of indicating up to 10 different types.
5.3 - Level of interactivity	**Scale: very low, low, average, high , very high.** The possible overlap with the previous description is interesting. In fact, it is possible to have "active" material with a low level of interactivity (i.e. written instructions to carry out an experiment) or with high interactivity (i.e. a sophisticated simulation environment) . It is also possible to have an espository type LO with low interactivity (i.e. a PDF document) or with high interactivity (i.e. a hypertext)
5.4- Semantic density	Indicator which should give useful information to evaluate the level of **concision of a LO** independently from the level of difficulty. It is very subjective and it varies depending on the context and the target user (the same LO could be considered concised or longwinded).
5.5- Role of the user	It is **the user for whom the LO has been created**: teacher, author, student, manager.
5.6- Type of context	Indicator of the **kind of environment** where the LO is expected to be used. The controlled vocabulary for this indicator includes " primary education, secondary , university, professional training, other"
5.7- Age of the people for whom the material is targeted	The **age of the user** of the LO is important when researching a LO, especially in the school context, both from a teacher's and a student's perspective. L'IEEE/LOM suggests indicating the minimum and maximum age.
5.8- Degree of difficulty	**Scale: very easy, easy , fairly easy, difficult, very difficult.** Also in this case the parameters are subjective.
5.9- Duration	An indication of the **maximum time allowed to the user** which is defined in advance taking age and role into account.
5.10- Descritption	Comments on **how to use** the LO.
5.11- Language	It is a different type of indicator than the one in the general category that refers to the language in which the LO is expressed Here , however, we refer to the **user's language**. For example a Learning Object in English for an Italian student will be described as English language in the general category and in Italian in this section. The language is indicated according to the ISO code (EN, IT, RO, ...)

CHAPTER 7: A COPYLEFT LICENCE MODEL

CREATIVE COMMONS LICENCES

The availability of materials is essential to encourage more and more teachers to carry out online learning activities. But learning materials, to be available and used in different contexts, need to have the typical features of LOs, namely granularity, adaptability, accessibility, transportability/interoperability, re-usability and durability.

Last but not least they must provide the possibility of free use.

The idea of Learning Objects was generated to meet the requirements to have "chunks" of reusable didactical contents. Yet, if they are protected by copyright, only who owns the rights can reuse them. The logic of ownership goes against the requirements indicated in the premises.

Copyleft licenses have been firstly introduced to distribute opensource software; following, the idea has been applied to the software documentation, and nowadays copyleft licences are used in many different intellectual fields.

ORIGIN OF THE COPYLEFT LICENCES

Thanks to a pun, the word copyleft was coined to allow free distribution and reuse of Free/ Open software. "Left" opposite to "right" as in the political terminology, but also "left" coming from the verb "to leave" in sense of " not constricted", "let free".

Yet any type of freedom, to be granted, need observance of some rules. What if, I produce free software and somebody uses it (I allow him to do that) applying a copyright on it? This is the reason why "licenses" have been provided in order to protect and grant the rights of free use. Practically, to be legally protected, the creators of free software state: "©This software is released under licence X".

The main copyleft software licenses have been developed by the Free Software Foundation: *GNU GPL* and *GNU LGPL*.

The GNU GPL license (GNU General Public Licence) is the most widely used licence for what concerns software Formulated by Richard Stallman and Eben Moglen in 1989, it aimed at distributing the programs created within GNU project. The latest version, 2, dates back to June 1991. (http://www.gnu.org/licenses/gpl.html).

The nutshell of GPL is as follows:

- the licence is applied to any program which, under the entry copyright, indicates GPL licence;

- the use of program is permitted;

- the alteration, copy and redistribution of software is allowed both in its original form or modified, both free of charge or not, provided that each copy shows the same licence and that the source code can be available in case of alterations. The GNU Lesser General Public License - GNU LGPL - allows the creation of links between free and proprietary software. It has been mainly formulated in order to allow the use of repositories containing free and not free software.Another important step towards the generalization of copyleft licences has been the GNU Free Documentation Licence - GNU FDL. It was created in order to distribute software documentation and training material.

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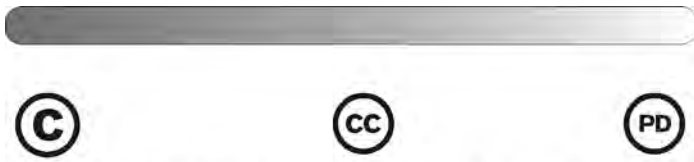

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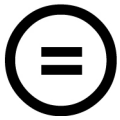	You let others copy, distribute, display, and perform only verbatim copies of your work, not derivative works based upon it.
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CHAPTER 8: OER REPOSITORIES

During the past few years, hundreds of repositories of learning resources freely available to everyone have been developed.

Here we present some suggestions to explore repositories of educational resources, which are strictly related to the idea that learning contents should be developed by having in mind a learning strategy, specific learning objectives and outcomes, and a clear learning approach.

There are several repositories of digital contents on the so called web 2.0 world (e.g. YouTube, Flickr, SlideShare). The main difference with the repositories that are presented here is that Web 2.0 repositories are not specialized for educational purposes, but they are general purpose. This does not mean that resources found in these repositories are unsuitable for educational purposes! It means that it is necessary to make a further effort in using these contents, in order to integrate them in an educational path.

INTERNATIONAL REPOSITORIES

Following, there is a list of repositories of Open Educational Resources:

- ***MIT OpenCourseWare (OCW)*** is a web-based publication of virtually all MIT course content. OCW is open and available to the world and is a permanent Massachusetts Institute of Technology activity – http://ocw.mit.edu/
- ***Connexions*** is an environment for collaboratively developing, freely sharing, and rapidly publishing scholarly content on the Web. It has been started by the Rice University, and is now supported by the William and Flora Hewlett Foundation, the Maxfield Foundation, and the Connexions Consortium - http://cnx.org/
- ***Merlot Multimedia Educational Resource for Learning and Online Teaching***; it is one of the major international repository. MERLOT is a program of the California State University, in partnership with higher education institutions, professional societies, and industry - http://www.merlot.org/
- OER Commons provides support for and build a knowledge base around the use and reuse of open educational resources (OER). As a network for teaching and learning materials, the web site offers engagement with resources in the form of social bookmarking, tagging, rating, and reviewing. Supported by the William and Flora Hewlett Foundation, ISKME, the Institute for the Study of Knowledge Management in Education created OER Commons as part of the Foundation's worldwide OER initiative in 2007- http://www.oercommons.org/
- ***Curriki*** is an online environment created to support the development and free distribution of world-class educational materials to anyone who needs them. It is the result of work done for GELC - the Global Education and Learning Community - an online project started by Sun Microsystems to develop works for education in a collaborative effort. *Curriki* contains mainly lesson plans. - http://www.curriki.org/
- The ***OpenCourseWare Consortium*** is a worldwide community of hundreds of universities and associated organizations committed to advancing OpenCourseWare and its impact on global education. It defines OpenCourseWare (OCW) as a free and open digital publication of high quality university-level educational materials. The Consortium website contains a list of OpenCourseWare Websites. http://www.ocwconsortium.org/

- The ***Global Learning Objects Brokered Exchange (GLOBE)*** alliance was established between the following founding members: the ARIADNE Foundation in Europe, Education Services Australia, LORNET in Canada, Multimedia Educational Resources for Learning and Online Teaching (MERLOT) in the USA, and National Institute of Multimedia Education (NIME) in Japan. These organizations have committed to work collaboratively on a shared vision of ubiquitous access to quality educational content. Since its inception, GLOBE has attracted the interest of other organisations with similar goals and as a result, the GLOBE community continues to grow. The aim of GLOBE is to make shared online learning resources available to educators and students around the world. GLOBE's website provides access to hundreds of Learning Objects - http://www.globe-info.org/
- ***Edrene*** is the result of an European co-funded thematic network on OER. It's website includes a list of educational repositories organized by country (http://edrene.org/results/currentState/index.html, and studies on the state-of-the-art of educational repositories worldwide (http://edrene.org/results/currentState/pan.html)

Many further repositories are listed at the Exemplary Collection of Open eLearning Content Repositories page of WikiEducator (in turn, a good source of materials that you can use to produce your Learning Objects):

http://wikieducator.org/Exemplary_Collection_of_Open_eLearning_Content_Repositories

The possibility to have free access to repositories of educational resources is the result of several theoretical and technological progresses occurred during the past decades; amongst others:

- the Open Source / Free Software Movement, that have influenced the development of similar initiatives in the field of Open Content;
- the Internet, as the infrastructure to exchange digital contents;
- the Open Educational Resources initiative;
- copyleft licenses to allow the sharing of digital contents.

However, we think that the most important factor that can make the sharing of educational resources possible is a teacher wishing to produce and share educational resources, who want to cooperate with colleagues in the world to build repositories of resources, and who has the skills necessary to produce Open Educational Resources.

One of the aim of the Sloop project, as well as of the Tenegen project, is provide teachers with the necessary competences and skills, and to encourage them in producing Open Educational Resources.

CHAPTER 9: CONCLUSIONS

Students are already online, the Tenegen project intends to drive teachers to join them.

The net can represent a new learning environment, free from time-space boundaries, able to enlarge the traditional one that is limited, restricted within classrooms which remain closed at least 16 hours a day, on summer time, on weekends and bank-holidays. Virtual environments - such as Moodle, FaceBook, SecondLife, Twitter, blogs and wikis, … - can become the new agorà of the educational "conversation".

But it's not enough to have our students online. It's not enough they can "connect" to peers and teachers. They also need to interact with quality "educational resources". Cooperating in preparing and sharing open educational resources is the way to build up repositories of high quality learning resources.

Thanks to the sharing model and the "tagging" system, Web 2.0 has "embraced the power of the web to harness collective intelligence" [O'Really 2005]. The use of the web to share material, learning paths and didactic projects is likely to gather the collective knowledge of teachers and students making the educational systems fly up [Ravotto 2008].

It may be the future, but only if the trend to "openness" will get the better on "closing".

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Here the references:

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2. *Moodle book "Open Educational Resources and Repositories", by Giovanni Fulantelli (Tenegen).- (Paragraph 2, 3)*
3. *Scorm MetaLO 1, "Learning Objects", by Francesca Berengo, Severina Caroli e Monica Terenghi (SLOOP). - (Paragraph 4)*
4. *Moodle book "SCORM explained to teachers", by Giovanni Fulantelli (Tenegen), based on Scorm MetaLO3, "SCORM Standard", by Pierfranco Ravotto (SLOOP). - (Paragraph 5)*
5. *Scorm MetaLO4, "Metadata", by Mara Masseroni, Luisa Farinati e Marilena Vimercati (SLOOP). - (Paragraph 6)*
6. *Scorm MetaLO8, "Sharing Learning Objects", by Pierfranco Ravotto (SLOOP). - (Paragraph 7)*
7. *Moodle book "Open Educational Resources and Repositories", by Giovanni Fulantelli (Tenegen). - (Paragraph 8)*

SECTION 8

E-LEARNING IN THE PARTNER COUNTRIES

E-LEARNING IN TURKEY AND ITS FUTURE

We would like to abstain from the same explanations on eLearning but to reveal the Turkey's place considering only eLearning field. In Turkey, eLearning concept has begun to be appreciated by the expansion of using internet and computer infrastructure in the frame of its importance and urgency in additon to its usage among the ones who are not able to have the formal education because of their own conditions. The related departments of the Governmental Institutions in Turkey have been achieved many academic and political workshops on the future, efficiency, technology and fields of application of ELearning within the context of its urgency and importance in recent years. These workshops and commissions have achieved so many workshops, conferences and symposiums and the mission of all eventuate in the acquaintance of both the academic platforms and other sectors with the fact of eLearning.

Turkey have made significant progress toward eLearning. At present, many universities in Turkey have distance learning programmes and many sectoral and governmental institutions started to have distance in-service training programmes. So, in this case all information technologies in distance learning , web 2.0 technologies, multimedia technologies and the innovations are begun to be followed closely.

The open source accessibility of eLearning is considerably preferred by all institutions, NGOs, courses and universities since its low-cost applicability, student's accurate accessibility to course components and multimedia appliances and the sustainability of the education without any impossibility on assesment standards, any information loss but also reaching advance repository of information. Moreover, many universities have begun to develop their own Learning Objects Libraries.

Nowadays, a great many educators, lecturers, academicians and teachers have a clear conception of eLearning and try to learn how to develop the LOs, how to give distance education with the help of LMS platforms, how to manage the distance learning, how to associate them with the communication and social platforms on web 2.0.

Turkey is eagerly ready to accept the innovations of distance learning and life long learning. We support distance learning and life long learning to the end.

We are pretty aware that Turkey, being a partner in TENEGEN project, has a big chance to be informed on the sectoral innovations and to hold a operative place regarding the sudden developments on distance learning in the country.

TENEGEN Turkey Group

Balıkesir University, Ayvalık Vocational Highschool and Ofis-fr Consultancy

IF WE BUILD IT, WHO WILL COME?

THOUGHTS ON TECHNOLOGY-ENHANCED LEARNING IN GERMAN VOCATIONAL EDUCATION

ABSTRACT

E-learning is a hotly debated topic in many quarters and one of these is German vocational education and training (VET). The introduction and expansion of e-learning anywhere, however, is dependent upon the permeation of the relevant technologies with the society. Germany has a well-developed and growing internet infrastructure, thus providing the foundation for further incorporation of e-learning elements into curricula. While the Germans do not appear to believe there is an explicit group of individuals who could be called the 'net generation', there is an awareness of the widespread presence of technology which everyone – students and teachers – must come to terms with. The approach thus far has been to consider the teaching side of the equation, but it is becoming increasingly important to understand both the development and learning sides. For this reason, the notion of the e-learning professional is introduced and explored. As an example for linking the technology to VET, eportfolios are considered in more detail. Finally, a brief look at the recent developments in EU educational policy provides us with a springboard for thinking about the best way forward.

INTRODUCTION

In this chapter, I would like to address the topic of technology-enhanced learning in the particular context of German vocational education and training (VET). As one of the more technologically advanced, western countries, Germany plays a particularly strong role within Europe in particular. Its reputation for high-quality engineering products immediately brings it into association with technological themes, and technology-enhanced learning is no exception. Though more often called 'e-learning', what is meant is all types of learning that are being supported or conducted through or with the help of computer technologies, in particular the internet and world-wide web. Our purpose here is not to evaluate the value any given technology, but rather, I would like to explore the possibilities that these technologies open up for VET in particular.

Much of what is written these days is directed toward technology-enhanced learning in higher-education environments. These are professionally qualifying environments, of course, but as we shall see, vocational education plays a particularly strong role with the German education system. We shall also see that due to the development of these newer technologies and their widespread presence in education already, we are experiencing what I would call a critical shift toward their use.

In this chapter, then, I would like to explore the current situation in Germany in regards to internet access and the growth of technology-enhanced learning and to take a first look at the situation that e-learning plays in both higher and vocational education. After that, we will take a closer look at the interaction between technology and education in order to determine which directions we may need to consider when combining the two. As one of may possible

examples, e-portfolios will be considered as a tool for use in vocational education in particular. I will conclude with a brief look at where the development path may be heading.

CURRENT SITUATION

Our attention is first drawn to the issues of access and participation in the digital world. Who can use the internet, who does use the internet, what is it used for, and where is the e-learning market going are the questions we will concern ourselves with first.

INTERNET ACCESS AND TECHNOLOGY-ENHANCED LEARNING IN GERMANY

Access to the internet in Germany has been continually increasing in both absolute and relative terms for over a decade (van Eimeren & Frees, 2010). Figure 1 shows the development of access in both absolute and relative terms over the past five years. At present, more than two-thirds of the population over 14 years of age have internet access. This no doubt reflects the decrease in prices for both hardware and for access itself via internet service providers.

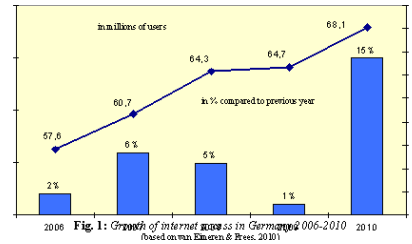
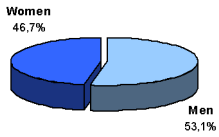


Fig. 1: Growth of internet access in Germany 2006-2010 (based on van Eimeren & Frees, 2010)

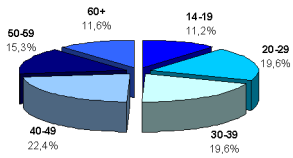
Growth of Internet access in Germany 2006-2010

In this year, the distribution of users according to gender is not surprising either, as is depicted in Figure 2. The proportion of users by gender has remained relatively stable over time, though there has been a slightly larger rate of increase in the number of female internet users in Germany.



Distribution of usage by gender in Germany 2010
(based on van Eimeren & Frees, 2010)

Of particular interest to the TeNeGEN project, of course, is that group of users aged 14 to 29, the so-called 'net generation' (a subject to which we will return directly). This group comprises just under a third of the total internet population, as shown in Figure 3. More important, though, than the mere number of users is the reasons for using the internet. In other words, which web and internet applications and activities are preferred by this group of users. Table 1 gives an overview for 2010.



It would seem, at first glance at any rate, that there is nothing out of the ordinary regarding usage. The figures for Germany reflect generally those for other countries with a highly developed telecommunication infrastructure.

Distribution of usage by gender in Germany 2010
(based on van Eimeren & Frees, 2010)

	Total	Men	M14-29	Women	W14-29
Send and receive emails	84	87	91	80	92
Conduct searches	83	88	93	78	92
Search for specific offers	47	51	45	43	45
Simply surf the internet	44	49	59	38	51
Home banking	33	39	29	27	26
Participate in online communities	32	30	64	35	73
Instant messaging	29	31	68	26	55
Forums, newsgroups, chats	19	20	48	17	38
Download files	18	23	33	12	18
Online games	13	15	31	11	18
Listen to live radio on the internet	12	15	17	8	12
Get music files	11	14	33	8	16
RSS feeds/news feeds	11	13	23	9	11
Timeshifted Video/TV	8	9	13	6	14
Online auctions	7	9	5	6	5
Online shopping	6	7	7	4	6
Watch TV live on the internet	5	6	9	4	8
Order books or CDs	4	5	7	4	3
Download other files	3	5	12	1	3
Timeshifted audio/radio	3	4	5	2	2
Contact and partner-search sites	3	3	4	3	5
Audio podcasts	2	2	3	1	2
Exchange sites	1	2	6	0	1
Video podcasts	1	2	2	1	1

Internet usage by gender, in particular 14-29 year-olds
(based on van Eimeren & Frees, 2010)

Given the premises of the TeNeGEN project, however, the question can be raised regarding the presence or absence of a so-called 'net generation' (those born 1980 or later). The general data provided by the survey reported by van Eimeren & Frees does not directly address this issue. What they do report, however, is the number of individuals who are currently undertaking their vocational or professional qualification, as opposed to working individuals or retired persons, which presents a more interesting picture.

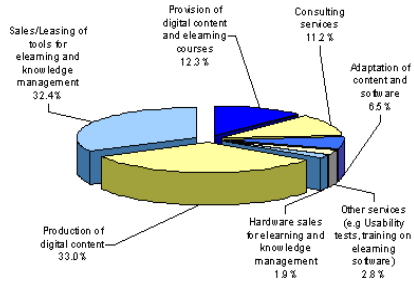
This data is collected in Table 2. It is worth noting that there has been a slight decrease in the proportion of students using the internet. This has been accompanied by a slight increase in the proportion of working people using it. This may reflect a simple demographic shift, of course, but only about one-fifth of all internet users are students in professional or vocational qualification programs. It is here that we might find our candidates for the 'net generation'.

	2006	2007	2008	2009	2010
in qualification programs	19.4%	17.4%	18.7%	16.3%	16.5%
working	62.7%	62.7%	62.1%	65.3%	66.3%
retired	18.1%	19.9%	19.2%	18.4%	17.1%

Internet usage by activity
(based on van Eimeren & Frees, 2010)

THE E-LEARNING INDUSTRY IN GERMANY

According to Michel (2009) total e-learning revenues were €328.7m in 2008 and €346.1m in 2009, an increase of 5.3%. This reflects, of course, only the commercial sector. Any e-learning or online development or other service activities in the education sector would not be reflected in these numbers. Nevertheless this volume represents a respectably sized market, and more importantly it is one that has been growing steadily for a number of years, showing growth rates of just over 13% from 2006-2007 and over 17% from 2007-2008. The largest sectors of the industry, as can be seen in Figure 4, are the sales and leasing of e-learning and knowledge-management tools (32.4%) and the production of digital content (33.0%). Both of these sectors could provide support and services for higher education and vocational training.



Distribution of e-learning revenues by type of activity (based on Michel, 2009)

E-LEARNING IN HIGHER AND VOCATIONAL EDUCATION

It would seem, then, that there is a rich internet and e-learning landscape in Germany, even if there is not a specific e-learning-oriented, or 'net', generation that is driving it. Wacher (2003) raises the issues that making learning offering attractive for learners is important, especially in subject areas, such a political education, that are by nature less attractive to potential students. Kaltenbaeck (2003), on the other hand, sees the development of technologies themselves (smaller, faster computers, broadband, etc.) as the potential for new forms of learning, especially learning on or near-the-job. Klein & Zedler (2004) make the claim that e-learning is widespread, but upon closer examination, we find that they are referring to large organizations, for example, Siemens, Daimler, or Allianz. All three authors thus far see e-learning in effect as computer-supported learning in general, that is, everything from computer-based training (CBT) through web-based training (WBT), but blended-learning approaches could be included as well. All are also in agreement that there are a variety of factors that determine the potential success of these new forms of learning. More recently, Revermann (2006) has shown that a lot of time and money has been put into developing e-learning in German higher education. He maintains that the drivers have been the desire for more flexible learning arrangements (both in terms of time and space), the possibilities for communicative and interactive learning, as well as simulations or the like. Accordingly, he sees us moving from a technologically driven perspective toward a more didactic-pedagogic approach. In comparison to higher education, the VET sector has been more reserved, but as was shown above, the market for e-learning products and services is one that is steadily growing in Germany. Michel (2007) reinforces the point that e-learning is more than just a

technological innovation, rather it is an opportunity, especially for small and medium-sided enterprises (SMEs). This is a new challenge for e-learning product and service providers as they must now make good on their original claims of cost-savings in the area of education and training.

It would seem, then, that we are in a period of transition. The technological possibilities are growing and with them an interest in what these technologies can do for education. Interestingly enough, there also appears to be a trend toward better understanding of the educational uses of technology, that is, we are moving away from a technology-driven understanding of e-learning toward a stronger educational perspective, a welcome trend, to be sure. This represents a kind of critical shift in the German e-learning landscape.

IS THERE A GERMAN 'NET GENERATION'

Given the particular focus of the TeNeGEN project, it is worth asking whether the Germans believe their young people belong to a 'net generation' or not. While there are those who insist there is something called a 'net generation' (Prensky 2001a, 2001b; Tapscott, 1997, 1998, 1999; Oblinger & Oblinger, 2005, among others), sound evidence supporting this has not been forthcoming. In the English-speaking world, Kennedy, *et al.* (2006, 2007, 2008) and Jones & Cross (2009) have provided rather convincing evidence that this 'generation' is not the technologically savvy group that Prensky and others would have us believe. In the German-speaking world (cf. Wittkewitz (2009); Ebner & Schiefner (2009) for similar results for Austria and Switzerland) in general, and in Germany in particular, the situation is not all that different. Schulmeister (2009) has been monitoring the uses and types of uses of internet applications by youth and young adults for a number of years, and has yet to find evidence that these individuals use media or computer technology in a more sophisticated manner than the rest of the population. Socializing and passive media consumption predominate. This is reflected, at least in part, in the information presented in Table 1 above. It would seem, then, that there is little evidence to deduce the presence of a 'net generation', but that immediately raises the question as to whether that should be the reason for concerning ourselves with net technologies in education. I would think not.

As was mentioned earlier, the introduction of information technologies, new media, and online and web-based, that is, technology-enhanced instruction demands that we give closer consideration to what is involved. It is not only that teachers (who for some reason are one of the last professional groups to embrace technological change) would benefit from understanding these technologies better. This is certainly the case, but an awareness of the possibilities and limitations of these technologies can enable teachers to develop their lessons more effectively in certain situations. We would be misguided if we thought that technology is the answer to many of our education ills, however, it can, in certain situations, perhaps enhance learning, and we should be open to such possibilities.

We can only do this if we understand. Given the sheer volume of instruction that many institutions are attempting to move online, we need to ask ourselves if the individual teacher is the only person who can be made responsible for these development efforts. We will take a look, therefore at the notion of 'e-learning professional' in the context of German VET.

E-LEARNING IN GERMAN VOCATIONAL EDUCATION

Postman (1985) aptly noted, "a major new media changes the structure of discourse" (p27). As such, they also change what we believe to be true and how we understand the world around us. This is, of course, relevant to education: as teachers and learners we do much discoursing in particular ways, and the objective is a new, perhaps better, more informed view of the world around us. The so-called internet/web revolution promised to change the nature of education in many ways. However, as with all new technologies, there needs to be a group of individuals, or an estate, who are the masters of that technology and who can help shape the discourses that take place in that medium. Enter the e-learning professional. How this individual is conceived, though, is not as straightforward as it may first appear. Different cultures may take different tacks. Given the nature of modern e-technologies, national and specific cultural boundaries are becoming increasingly irrelevant. While teaching has long been the sovereign purview of local government, the globalization of communication itself is having deep-reaching consequences for that sovereignty.

In this section, then, I would like to take a closer look at the e-learning professional in the context of German VET. First, a distinction will be made between professionals and practitioners in light of the specific German context, and we will consider how this group of individuals fits into this environment. Specific roles will be identified and from these a range of developmental needs of practitioners will be developed. Based on these needs, a variety of ways for evidencing these needs will be identified. Finally, we will develop a general framework for addressing the assessment of continuing development and certification needs. We shall see that the particular German case forces us to think in broader, yet more specific, terms in regard to the role of e-learning practitioners.

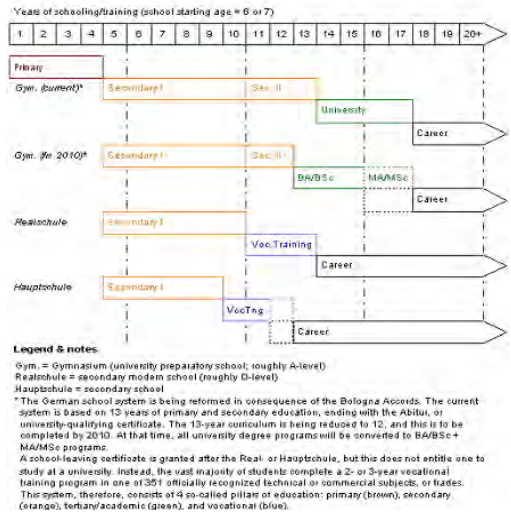
ROLES OF E-LEARNING PRACTITIONERS

The German educational system is structured differently from most Western and Western educational systems, and three features of this system are especially worth noting (see Figure 5). First, streaming is conducted by means of school forms, that is, there is the *Gymnasium* for preparation for university study, the *Realschule*, which encompasses the standard education requirements, and the *Hauptschule*, which is responsible for providing the minimum education required by law[1]. Second, the Germans consider this system to consist of 4 pillars: (1) primary, (2) secondary, and (3) tertiary, as well as (4) VET. In other words, in Germany, VET is considered to be on equal footing with other types of education.

Finally, throughout one's career in Germany most employers will encourage employees to participate in relevant continuing or further education, which may or may not be sponsored by the employers themselves.

1 Streaming is according to ability, but is determined solely on the basis of grades and a teacher recommendation. The decision on which stream a student will attend is made at the end of primary schooling, that is at the end of grade 4, around 11 years of age. There has been an effort over the past 30+ years to unify the three streams into one comprehensive school, but change is slow in Germany. In spite of all OECD recommendations, there is no sign at the moment that the general overhaul of the system, which is sorely needed for the 21st century, will be accomplished soon.

Nevertheless, there is a large network of approximately 20,000 small to mid-sized companies providing such training in Germany, in addition to the larger, more well known companies, such as Siemens, Daimler, etc. Germany's system of education is a bit different from its European neighbors, primarily in the emphasis that is placed on VET. In Germany, both initial vocational training and further vocational training play major social and professional roles. The majority of school-leavers become vocationally qualified; only around a quarter of students attempt university studies, and those who do not complete these will invariably then learn a trade or craft. It is not clear that the tool can be transposed one-to-one into this educational sector. The use of eportfolios in VET is not often mentioned in the literature or discussions on eportfolios.



The German educational system

In VET, there are over 350 officially r ecognized apprenticeship programs, which can be broken down into three general categories:

1. Crafts and Trades
   Traditional training such as carpentry, cabinet-making, brick-laying, automotive mechanics, metal-working, but also fields, such as nursing, social work, pre-school education, etc.

2. Technical
   Newer skill sets, such as computer programming, software development, but also combinations such as mechatronics, medical technician, automotive or industrial electronics, and so on.

3. Commercial
   General office skills and jobs, like banking, retail, transportation, logistics, clerical, etc.

All apprenticeship programs have a theoretical and a practical part. The theoretical part is a relatively small proportion of the overall training, and is concerned primarily with basic IT skills, worker health and safety issues, employment law, and a general understanding of the industry in which they are working. Training is conducted by companies, most of whom take on the apprentices as regular employees once they have completed their training. The bulk of the training, however, is supervised, on-the-job training (learning by doing). At the end of the apprenticeship each apprentice must undergo a written and oral examination under the auspices of the regional industry and trade associations. Upon completion of vocational training, one attains journeyman status.[2]

Germany is, therefore, one of the last countries to still have a clearly delineated differentiation between crafts/trades and other occupational groups. Whether one is a commercial specialist (such as a clerk or office worker), works in industry (warehousing specialist, production buyer) or in services (social worker, nurse), Germans will have undergone a two- or three-year apprenticeship program that qualifies them to call themselves by a given vocational title. This is their *Beruf* (lit. "calling")[3]. Throughout the course of their careers, they may undertake further training or attend company-sponsored continuing training, but they will not generally be required to keep their skills and knowledge up-to-date[4]. It is expected that those in services, such as nursing, will keep abreast of new developments as they are introduced into their practical, everyday work. In other words, the role of VET is much greater than elsewhere, and much post-job-preparatory training (that is, training that takes place once one has been qualified to practice a craft/trade or has received a university degree) is conducted by private companies who specialize in further adult education.

Continuing training is desirable, to say the least, but it is a matter of choice, not requirement. It should be noted, then, that the notion of "professional" is quite different than in, say, English-speaking countries[5]. If a person is qualified as a technician, one will most likely remain a technician. What is more, without a university degree, that individual will never be considered a "professional": a subject-matter expert, even a highly qualified technician, but not a professional.

The difference is subtle but profound. This has far-reaching consequences for what English-speakers consider to be "continuing professional development" (CPD). For this reason, all individuals considered in this section will be referred to as practitioners, not professionals

A search for e-learning-related jobs in German search engines reveals two general types of positions (which roughly correspond to the types of positions discussed in some of the relevant (English-language) literature, e.g. Beetham, H., *et al*., 2001; Oliver, 2002; Liewski & Joyce, 2004; Warrior, 2006) and which we may conveniently specify as

2 It is possible to continue with a formal master-tradesman qualification (additional 7 years of training, part-time, mostly evenings and weekends), which is required if one wants to start one's own business, but this is a path not followed by the vast majority of workers and will not be considered here

3 From the German translation of the Latin *voco*, "I call/name/summon", which is the root of the English "vocation".

4 In fact, German is the only language I know that has a word for being finished with learning something, namely *auslernen* (lit. "learning out/completely/to the end").

5 Those who are considered professionals in Germany are those who have gone to university to study (cf. Perkin, 1996, Ch. 5). A person *learns* a vocation, one *studies* to become a professional. Doctors, veterinarians, dentists, lawyers, teachers, and the like, are all professionals by decree, so to speak, that is, they must pass certain state exams in order to undertake the second, practical, phase of their education (generally over a two-year period), after which they must pass a further examination before being permitted to practice in their given field.

1. e-learning ***technologists***, or
2. ***e-learning*** technologists.
3.

The former can be considered the technicians, who deal primarily with technical, system, or networking issues, and the latter are those who deal primarily with educational, pedagogical, and content-related matters. A representative listing of roles of these two types of practitioners could be as follows:

Class	Position	Tasks
E-learning *Technologists*	Senior Specialist E-learning	Technical support, system integration
	System Integration Technician	System integration, network integration, hardware support
	Technician for E-learning	Network support, system integration, technical support
	Media Designer	Graphics design, layout design, layout implementation
	E-learning Developer	Programming, application development
	E-learning Application Developer	Application development, implementation
E-learning Technologists	Editor E-learning	Editor, quality assurance
	Teaching Assistant E-learning	Content design, process design, content specification
	E-learning Project Manager	Coordination, management, implementation, process
	E-learning Content Developer	Content design, process design, content specification
	Teletutor/Online Moderator	Implementation, student support, facilitation, assessment

E-learning practitioners and tasks

As can be seen, there is a good deal of overlap in the tasks required by these various practitioners, which can be further consolidated into a general listing of roles as follows:

Roles
Application developer
Content designer (process, sequence, etc.)
Editor
Learning facilitator
Network administrator
Project manager
Quality assurance specialist
System integrator
Teaching support specialist
Technical designer (graphics, layout, etc.)
Technical support specialist

Roles of e-learning practitioners

DEVELOPMENT NEEDS

It is worth noting that there are no formal continuing education requirements, no specific certification requirements placed upon individuals in a particular professional or vocational estate. There are, however, professional organizations and professional communities, but none which exercise the regulation of the profession itself. That is a matter for the lawmakers. What is more, there is still a strict distinction between the skilled worker (technician) and professional (university graduate). Titles of vocations and professions are regulated by law, and once one has successfully completed his or her training or studies, they received official documentation permitting them to call themselves by a particular title. Consequently, the issue of values becomes secondary. The issue of needs, however, remains an important one. The pace and degree of change in the area of technology appears – at least subjectively – to be increasing rapidly. The proliferation of computing technology and the growth of the internet and world wide web attest to this. In any area of rapid development, it is a matter of survival to keep abreast of new developments. There have been a few, limited attempts to develop certification programs for *Teletutors*[6]. These are comparable with both the ALT (2004, 2006) and LSN (2007) certification schemes. They have not really caught on and have been being outpaced by institutions of higher learning (in particular Universities of Applied Sciences (*Fachhochschulen*) who are offering their own qualification programs for e-learning practitioners). Moreover, all of these programs are slowly being superceded by both bachelor- and master-degree programs aimed at producing learning and teaching professionals who can deal with e-technology in teaching[7]. In other words, these degree programs are aiming at producing individuals identified by the second class of professional identified in the previous

6 An overview of the standard offerings can be found at http://www.checkpoint-elearning.de/etrainer/, http://www.teletutoren.net/, or http://www.time4you.de/ibt/time4you/site/time4you/ibt/de/start.cxjsp?pos=overQualifications.

7 For example, the FernUniversität Hagen (German counterpart to the UK's Open University, so to speak) offers a BA in Educational Sciences which has e-technology in education as one of its focuses; they also offer an MA in eEducation. The University of Duisburg-Essen offers an MA in Educational Media, as well as a certificate program in this area. The University of Rostock offers an MA in Media & Education as well as certificates in Online Communication and Design of Multimedia Applications. The Free University of Berlin offers a certificate in E-teaching, while the University of Oldenburg offers both a Diploma and an MA in Distance Education. Finally, the University of Applied Sciences in Furtwangen offers two programs, one as Expert for New Learning Technologies and a European Net-Trainer certification in association with the European Net-Trainer Association.

section, the *learning* technologist. However, it is also interesting to note that the ALT (2004, 2006) and LSN (2007) certification schemes are primarily initial certification schemes[8]. Neither of them have provisions for evaluating or assessing *required* continuing development. The thrust of the discussion is on what is needed now. In so far, there is a certain similarity to the German context, of course, that once degreed, always certified. What is also important is the fact that almost all certification efforts to date have taken place within the scope of government-established education (schools and universities). Vocational education in Germany is considered part of the educational system as a whole, but most vocational trainers work in the private sector, outside the scope of governmental oversight. Nevertheless, development needs can be identified which would benefit all practitioners in this area:

Roles	Development needs
Application developer	Web/communication technologies, programming, programming languages, team working
Content designer	Subject-matter expertise, application of web/communication technologies, pedagogy/andragogy, team working
Content developer	Subject-matter expertise, application of web/communication technologies, pedagogy/andragogy, team working
Editor	Subject-matter expertise, application of web/communication technologies
Learning facilitator	Application of web/communication technologies, pedagogy/andragogy, team working, subject-matter expertise
Network administrator	Web/communication technologies, network technologies, process implementation
Project manager	Application of web/communication and network technologies, programming, business skills, interpersonal skills
Quality assurance specialist	Web/communication technologies, network technologies, programming
System integrator	Web/communication technologies, network technologies, process implementation, team working, interpersonal skills
Teaching support specialist	Subject-matter expertise, application of web/communication technologies, pedagogy/andragogy, interpersonal skills
Technical designer	Application of web/communication technologies, graphic processing and design, audio processing and design, team working
Technical support specialist	Web/communication technologies, network technologies, programming, interpersonal skills

Development needs of e-learning practitioners

A question that immediately poses itself is "Why do we care?" One driver of the need to rethink the state-centered notion of professionalism and the need for continuing professional development is globalization. The Bologna Process (EC, 2008) is driving the restructuring of higher education systems throughout Europe and will encourage the exchange of professionals across cultures. The physical movement of specialists (or practitioners) within the EU will require a higher-order regulatory system[9] in order to ensure quality of product and service

8 Also, the question of cross-national acceptance has not been addressed at all: what status does the CMALT, for instance, have in Germany? My initial response would have to be "none".

9 Which, of course, does not yet exist, nor is there much evidence that there is movement in this direction. JISC (2004), for example, does provide a list of comprehensive competences, but not with the intent of a standardization that would be binding for all e-learning practitioners. It could be used as a starting point, however.

delivery. Beyond this, the technology involved is global: what can be offered online can be offered independent of location. How is the value and quality of the product or service assessed? As pointed out above, the German educational and certification system makes no overt provision for continuing development and no provision for ensuring the integrity of the professional estate. It would seem, then, that professional development and providing evidence thereof is something that everyone in a given profession should be concerned with.

WAYS OF PROVIDING EVIDENCE

Given the lack of accepted standards throughout the field of e-learning, and as there is no system of formal certification nor private-sector certification that is applicable within the vocational area of German education, the current alternative is to consider best practice and individual accomplishment (Hillier, 2002; Goodyear, *et al*., 2001; JISC, 2004; Dondi, *et al*., 2005). This is being practiced in English-speaking countries[10] and appears to be a sensible starting point for developing a nationwide standard in Germany. As we have seen, however, each role has its own development needs, but these overlap from role to role. The driver of evidencing, of course, are the needs themselves, as shown in the following table:

Development needs	Ways of evidencing	Applicable roles
Business skills	Certificates, further education courses, letters of reference or commendation, statements of results	Project manager
Graphic/audio processing and design	Artifacts (e.g. pictures, layouts, templates, podcasts, open-source-project participation), certificates, further education courses	Technical designer
Interpersonal skills	Certificates, further education courses, letters of reference or commendation	Learning facilitator, project manager, teaching support specialist
Pedagogy/andragogy	Artifacts (e.g. online courses or modules), certificates, further education courses, letters of reference or commendation, statements of results	Content designer, content developer, learning facilitator teaching support specialist
Process implementation	Certificates, further education courses, letters of reference or commendation, statements of results.	Project manager, network administrator, system integrator
Programming & programming languages	Artifacts (e.g. programs, modules, open-source-project participation), certificates, further education courses	Application developer, quality assurance specialist, technical designer

10 The Carneige Foundation's *Gallery of Teaching and Learning* (http://cms.carnegiefoundation.org/ gallery_of_tl/keep_toolkit.html) or the *Past, Higher Education Projects: Pluralism and Unity, Liberal Arts Institutions, and General Education in Research Universities* from the William and Flora Hewlett Foundation (http://www.hewlett.org/Programs/Education/Opportunity/Past+Higher+Education+ Projects.htm) are examples from the higher-education sector.

Development needs	Ways of evidencing	Applicable roles
Subject-matter expertise	Certificates, further education courses, published materials, provision of materials online	Content designer, content developer, teaching support specialist
Team working	Certificates, further education courses, letters of reference or commendation, statements of results	Application developer, content designer, editor, learning facilitator, network administrator, project manager, quality assurance specialist, system integrator, teaching support specialist, technical designer
Web/communication technologies, application	Artifacts (e.g. systems, projects, open-source-project participation), certificates, further education courses, statements of results	Content designer, content developer. editor, learning facilitator, project manager, teaching support specialist, technical designer
Web/communication technologies, technical	Artifacts (e.g. systems, projects, open-source-project participation), certificates, further education courses, statements of results	Application developer, network administrator, quality assurance specialist, system integrator, technical designer

Evidencing development for e-learning practitioners

It is apparent that in the field of German VET, it is essential that a formalized and recognized system of continuing development be established. Unfortunately, in the age of omnipresent, always-on, always-accessible communication platforms (such as the WWW), what means are available for separating the wheat from the chaff, the real from the merely claimed?

ASSESSMENT

Assessment calls up initial impressions of tests and testing. While this may be a general and usual image, it does not adequately cover what is meant by the term here. In the context of continuing practitioner development, and given the German proclivity for verifiable documentation, it would seem in this particular context, assessment must be expanded in meaning to include the attestation of the claims made by the practitioner. Certificates, letters of reference, letters of commendation, awards, and more can be digitized easily and published somewhere online making them accessible to potential clients or employers, but this does attest to the veracity of the documentation nor of the claims made. Similarly, these could be provided on request, for example, as email attachments, but this too does not insure that what is claimed is what is real. One way to overcome this problem, of course, is through the process of (mostly) independent, third-party verification. Organizationally this can be handled by an authorized private-sector organization (such as a professional association) or it can a governmental (or quasi-governmental) organization. But how should this evidence be made available?

All of the evidence listed in Table 6 can be provided in electronic form. The organization would provide each member with his or her own eportfolio (or, better, webspace), which encompasses both a public and private (organizational) area. The public area would provide an always-present, from-anywhere-accessible central repository for the members' artifacts illustrating his or her competences, as well as links to projects on which he or she has worked. In more technical areas, these may take the form of developed courses or simulations; in more educational areas, these may encompass study plans or exercises; in interpersonal areas, these may include letters of appreciation, student responses and testimonials, etc. Further, provision can be made to provide digital signatures (or attestation) codes for all documentation, so that clients or employers, for example, can be sure of the legitimacy of the documents.

Assessment of what may (or should) be included would be determined by the organization, but not strictly in the form of established criteria, but also in the form of third-party monitoring. In this case, each member would be assigned a mentor to assist in his/her professional development, and could oversee the member's continuing development. Assessments of the elements in the portfolio would best be a combination of personal (CDP, personal reflection) and peer assessments (skill audits, formal appraisal, on- and offline assessments), which would ensure greater transparency in regard to established standards. All together these approaches would provide for an accessible and trusted record of an individual's achievements and development.

KEY DRIVERS OF E-PORTFOLIOS IN GERMAN VOCATIONAL EDUCATION

Technology has always been involved in education, especially since the inventing of writing. From paper, to books, to blackboards, whiteboard, to audio-visual materials and machines, there has been a constant search for ways to use technology to enhance the learning process. This search seems even to have accelerated since the introduction of computer and networking technologies. Most recently, eportfolios have become a particularly "hot item." To date, eportfolios have been discussed primarily in the tertiary education sector, that is in colleges and universities. While some attention has been directed toward secondary education, VET – at least as it is understood in Germany – has been seriously neglected. Given the stronger, more formalized role VET plays in Germany, and given that most people will spend more time working than (formally) learning, though hopefully enhancing their skills throughout their careers, it would be worthwhile to consider more closely the role of eportfolios in German VET. In light of the recent, increased interest in eportfolios in education, we will first take a look at what is driving this interest and how this may be applicable to the German vocational-education context.

As the eportfolio is a relatively new tool, which is still under development, both conceptually and practically, it is worth considering what is driving the use of the tool, as well as what is hoped to be accomplished through it. The primary drivers of much of the interest in eportfolios are government agencies, quasi-government organizations, and educational institutions (e.g. QAA, 2001). A secondary driver is the group of commercial enterprises which are trying to develop eportfolio tools. In the UK, for example, all of the primary drivers see eportfolios as a way of broadening assessment and of increasing access to higher education. There are a number of programs that are being piloted in secondary schools (cf. Barrett, 2008a; 2008b) which aim at clarifying the related questions.

The anticipated outcomes of eportfolio use are also interesting: holistic assessment, transparency of qualifications, certified results and documentation of achievements, the development of life-long and life-wide learning, and deeper learning. These outcomes, however, can only be achieved when eportfolios are maintained over time and are controlled and managed by the users (cf. Barrett, 2004; Barrett & Garrett, 2007; Batson, 2002; Beetham, 2003; Cambridge, 2005; Greenberg, 2004;, Jafari, 2004). This presupposes, however, interoperable tools and platforms and permanent access to the portfolios.

Given the long-term nature of this thinking, it is difficult to think of eportfolios without considering personal development planning (PDP) as well. While planning and personal development have always played a role in education, the most fundamental problem has always been record-keeping and access to those records of accomplishment. Computers in general have made this easier, but it is only with the advent of the internet and worldwide web that just about anyone can manage the process on their own. Given the emphasis provided by the higher-education context, there appears to be more emphasis on professional (in contrast to personal) development (CRA, n.d.; Moon, 2001, 2005; Morris & Woodward, 2005; Steffani, 2005). As most university graduates are searching for professional positions (e.g. in healthcare, social services, education, management, etc.), PDP becomes relevant, as completing a multiyear degree program necessitates a certain amount of planning (choosing specific modules, sequencing courses, etc.) and may take place at more than one institution. Add to this the fact that many professional fields require extensive internships, which provide further opportunity for documenting learning and professional accomplishments, and we can see why eportfolios are an attractive tool for managing PDP and the documentation process. There is, however, the implicit (sometimes explicit) suggestion in the literature that the use of these tools should be extended to all types of education. Whether this is practical or even possible remains to be seen. What is more, there is little evidence that eportfolio thinking is being considered outside of traditional education (for example, in VET).

Moreover some thought needs to be given to the effects of these outcomes. There are a number of issues, such as intellectual property rights, personal data protection, freedom of information, digital security, sustained access, and others that need to be given more serious attention. The enthusiasm for the technology appears to too often override the long-term consequences of a given implementation. What is more, Acker (2005) identifies three obstacles to the acceptance of eportfolios: (1) protection of intellectual property rights for students, (2) increased faculty workloads, (3) "inverted" value to students (low at beginning, but high later in life). In addition, one of the greatest limitations at the moment is the lack of standards, both conceptual and technical. We have long standardized ways of communication, but the digital revolution is making the process easier to develop and maintain. At the onset, it is expected that many producers will enter the market attempting to provide the "best" tool. Yet, commercial enterprises come and go, often during any one person's lifetime, and proprietary systems are great inhibitors to freedom.

It would appear, then, that the primary use of eportfolios would be to help manage PDP, or give learners more ownership over their learning and to act as a repository for documentation and certification of learning achievements, thus providing a means for learners to be more directly involved in the assessment (for example, by selecting which artifacts would be included). In these terms, it would further appear that they would then fit in well in the context of German vocational training. What VET shares with academic programs is its variability of subject matter and multiyear duration. These features help drive the use of eportfolios elsewhere, but they are unknown in this educational context. While PDP is relevant, and while the documentation

of achievements (certificates, etc.) would lend themselves to inclusion in eportfolios, there are reasons to suspect that their introduction into this particular context might be slow.

The particular applications of eportfolios that are relevant can be identified. As Barrett (2004) phrases it, deeper learning is one possible outcome. This is in line with Greenberg's (2004) learning portfolio. In addition to learning, however, he also notes that showcase, or presentation, eportfolios can be of value to the student, especially when seeking employment or perhaps changing jobs later in his or her career, and structured portfolios to assist the student through the process, especially at the beginning. Moreover, what VET shares with the academic programs described above is its variability of subject matter and multiyear duration. These features help drive the use of eportfolios elsewhere, but they are unknown in German VET. In addition, there are reasons to suspect that their introduction into this specific educational context might be slow.

First, it is generally recognized that eportfolios can help learners take more ownership of their learning. They provide a platform for planning, discussion of objectives (particularly in conjunction with advisory and training personnel), storage of results, and most importantly reflection. It is thought that reflecting on what and how one learns will enhance one's ability to learn in the future. While, there is certainly a need to research this aspect of learning to see if this is in fact the case, preliminary indications are that it is so. Consequently, all aspects of the organization, personal and training planning could be managed using eportfolios. In Germany, however, curricula for the various training programs are set by the government and monitored and assessed by the Chambers of Industry and Trade (*Industrie- und Handelskammer*, IHK). Specific studies would need to be done to evaluate whether the planning and progress-assessment aspects of VET programs could be enhanced using eportfolios.

Second, eportfolios are a digital medium. Considering the different types of apprenticeship programs, it can be readily seen that craft and trade apprentices would have difficulty producing artifacts suitable for eportfolios, as these are solid, concrete objects that cannot be digitized. Granted, one could take pictures of such objects and include them in the portfolios. In the other two areas, certain items, e.g. those related to IT training, or general office functions, could possibly be saved and included in an eportfolio. In technical areas, the inclusion of plans, designs, technical drawings, or in commercial areas, items such as planning documents, disposition schedules, or quality management documents could conceivably be included as well. It would seem that the door is open to introducing such portfolios in vocational training in Germany. Of course, certificates, awards, and other such documentation can be readily included in eportfolios, so to an extent, they can serve as repositories of evidence of learning.

Third, the notion of allowing students to assess the end product of their learning is a very critical issue in German VET. In initial vocational training – that is, when the individual becomes qualified in his or her chosen craft or trade – the end product is the award of the IHK qualification. As a journeyman in the given vocation, the individual is permitted not only to work in that vocational area, but one is eligible for further qualification as a master tradesperson (*Meister*). This is particularly relevant in Germany, especially for a tradesperson, such as an automotive mechanic, or a carpenter or cabinet-maker, or an industrial machinist cannot open his or her own business without having received the master certification (*Meisterbrief*). This master certification, in turn, may only be awarded by the IHK. In other words, any formal role of eportfolios in German VET will only be successful once they have met with IHK approval. Perhaps even more important in this context, though, is the cultural attitude the Germans have toward education, certification, and qualification. German society

is more hierarchically organized than some other Western countries. The IHK and craft and trade guilds have traditions reaching back to the Middle Ages. Masters certify apprentices to become journeymen. The Guild of Masters certifies that a journeyman has become a master. To put it rather bluntly, it really doesn't matter what the student thinks of his or her work; what is important is what the certifying authority thinks of his or her work. There are indications that this strict, hierarchical attitude is weakening somewhat, but given its cultural anchoring, this will certainly be one area where resistance to new methods will be strong and change will come slowly.

Finally, it must be remembered that the bulk of practical training takes place within the employing company. Many, if not most, of these are small- and mid-sized companies (which form the backbone of the German economy). Intellectual property rights and trade-secret issues are important in these organizations, for it is often only slight variations in process or technique that differentiates one competitor from another. Consequently, many German companies are very cautious when it comes to publicizing company-internal information. This, if nothing else, can, and most likely will, have a significant impact on the implementation of eportfolios in German vocational training. The implementation of eportfolios will therefore only occur when the peripheral – especially the legal and data-protection – issues mentioned here have been adequately addressed.

This is not to say that eportfolios will not be accepted in German VET. Initial and further vocational training are highly regulated areas, to be sure. As we have seen, all aspects of this training are controlled, monitored and regulated by the IHK. We should remember, though, that not every journeyman goes on to earn his master certification. In the more turbulent employment cycles that we are experiencing it is becoming more and more necessary for Germans to perhaps work in vocational areas other than those for which they were originally qualified.

There are not a few Germans who have found it necessary to retrain completely into another vocational area simply because there are no longer enough positions in the original field (such as in the shipbuilding industry, where most jobs have moved off-shore, hence shipbuilder trades are not in demand any longer). Regardless of where Germans ultimately work, given the speed of modern technological developments, further education and training in specific areas are becoming increasingly important. Quite often, this further training is more abstract in nature, for there is a general trend away from manual toward mental skills (cf. Negroponte, 1996; Perkin, 1996; Handy, 1998; Malone, 2004; Pink, 2004). These work-related further qualifications and training are beyond the authority theater of the IHK. In Germany, such training is provided by private-sector training companies, so it will be here that the implementation of eportfolios has the greatest, and quickest, chance of success.

LAST THOUGHTS ON E-LEARNING PROFESSIONALISM IN GERMANY

One of the challenges of this section has been the examining of the role of e-learning professionals within the context of German VET. It was shown that the German system differs from other education systems in its clear division between what is considered vocational and professional. This applies not only to the learners, but also to those who develop and implement e-learning materials. Hence a distinction was made between e-learning

practitioners and e-learning professionals. A number of roles were identified, and it was shown which developmental needs can be associated with these. The needs of the various roles were taken as a starting point to identify ways of evidencing development in these areas. Also, the role of both peer and self-assessment was considered. Further, eportfolios have been considered in the context of German VET. It was noted that they can serve a multitude of learning purposes and as repositories for two types of items: documentation and learning artifacts. We saw that the IHK plays a major role in this sector, particularly in regard to initial and further vocational training and certification. It was also seen that while some things are possible, there is much within the culture and system itself that may inhibit the quick adoption of this tool. The restricted view of ownership of learning, the reluctance to include students in the assessment process, the using of eportfolios for providing learning evidence in the trades, and other important issues, such as intellectual property and trade-secret rights, need to be addressed. Two important factors are at play: Recalling Postman, the impact of e-technologies (on education and training in particular) is greater and more far-reaching than the limited discussion of skills, competences and technical possibilities in this section. This is augmented by what Perkin (1996) characterizes as the shift to a professional society. One of the trends he identifies is the attempt by professional elites to "deprofessionalize the employed professions" (p188). The absence of any system, as we saw here, makes one particularly vulnerable to the negative effects of both factors. Their combination, though, needs to be addressed seriously and across a broad front.

BUILDING E-LEARNING ON A MORE SOLID FOUNDATION

In the area of EU education policy, however, the groundwork for such a broad front is being laid. Recent initiatives in both the vocational and higher education sectors are opening new opportunities for reconsidering our approaches to education and training. In particular, these are a credit system for vocational education (ECVET), the credit system for higher education (ECTS) and the call for the establishment of general qualification frameworks in all EU member states. Let's take a brief look at each of these in turn.

ECVET

Since the establishment of the Copenhagen Process (EC, 2002), which emphasizes the need for a credit transfer system for VET, the signatory countries have been working together to develop strategic and innovative policies and actions that would encourage more people to take advantage of vocational-learning opportunities. The goal has been to develop actions and tools which allow users to build upon learning that they have acquired at various times, not only formally, but also in non-formal and informal contexts. The national ministers of education meet every two years to continue this process. In 2009, a recommendation was issued by the European Council and Parliament to develop a European Credit System for Vocational Education and Training (ECVET) (EC, 2009).

The aim of the ECVET system is to facilitate the validation and recognition of work-related skills and knowledge that has been acquired in various situations (overseas, non-formal learning, etc.), so that these experiences can form a contribution to the individual's own vocational qualifications. As such, it is intended to provide for better compatibility among the various VET systems throughout Europe. Though still in development, by 2012, a technical framework should be created to describe qualifications in terms of units of learning outcomes, including assessment, transfer, accumulation and recognition procedures. Each of the units of learning

outcomes will then be associated with a certain number of ECVET points developed on the basis of common standards (at present, 60 ECVET points equals one year of full-time VET). In other words, the system is flexible in that a person's learning outcomes are to be assessed and validated in order to transfer credits from one qualification system to another. Accordingly, learning outcomes for a given qualification could be acquired over time, in different locations and countries, and according to different methods (formal, non-formal, informal learning). Finally, the credit-point approach is designed to be compatible with the European Credit Transfer and Accumulation System (ECTS)[11]. The EC is in the process of developing an ECVET users' guide and establishing a ECVET users' group as well as an ECVET network. Several projects focusing on the development and promotion of ECVET are being developed and funded by the EU's Leonardo da Vinci Programme for vocational training.

ECTS

ECTS is the a natural outgrowth of the Bologna Process (EME, 1999). The aim of the ECTS is to make teaching and learning in higher education more transparent across Europe and to facilitate the recognition of all studies and all levels, by allowing for the transfer of learning experiences between different institutions. This is intended to provide for greater student mobility and more flexible routes to attain degrees, as well as improving and supporting curriculum design and quality assurance. Courses are constructed in terms of learning outcomes, that is, what students are expected to know, understand or be able to do upon completion of their learning), and workload, or the average estimated time students would typically need to achieve these outcomes (cf. DGEC, 2004). Even though ECTS goes some way toward the recognition of a student's studies at different institutions and in different national education systems, higher education providers are nevertheless autonomous institutions, and the final decisions in regard to recognition and accounting for prior or other learning are still the responsibility of the relevant accepting-university authorities.

EQF

The European Qualifications Framework (EQF) was accepted in 2008 (EC, 2008) and is being put into practice all across Europe. Its intention is to encourage countries to relate their national qualifications frameworks to the EQF so that all new qualifications issued from 2012 on carry a reference to an appropriate EQF level. The heart of the EQF covers eight reference levels describing what a learner knows, understands or is able to do, that is, in terms of learning outcomes, as described above, upon completion of a given qualification. Levels of national qualifications can then be translated to one of the EQF levels, which range from basic (Level 1) to advanced (Level 8), thereby enabling an easier comparison between various national qualifications. Qualifications from one country can then be recognized in another country. The EQF applies to all types of education, training and qualifications, from school education to academic, professional and VET, shifting the focus from learning inputs, such as the length of a learning program or the type of institution, which have most often been the focus of traditional systems of education and training. More importantly, the EQF encourages lifelong learning by promoting the validation of non-formal and informal learning (cf. ECVET, above).

11 An example of a project aimed at facilitating this translation is Be-TWIN, Testing a joint ECVET-ECTS Implementation, LLP-LdV-2008-3995/001-001, which is running from March 2009 - February 2012. See the project website, http://betwin.stratford.ac.uk/, for more details.

The way forward

By now, it should be clear that German education in general and vocational education in particular are at an important crossroads. Accessibility to e-technologies has been increasing steadily over the past few years, and there seems to be no slowing of the trend. The internet and world-wide web have become fixed features of the German social and educational landscape. So far, there have been a number of excursions in the direction of e-learning, but given that the existence of a particular 'net generation' is doubted, there has been less emphasis on the need for developing e-technologies in education as perhaps elsewhere (such as the USA or UK, etc.). This is certainly not to say that e-learning, in any of its various aspects, is not an issue. We have seen that there have been a number of approaches and areas of development that could prove to be promising in the future, but obviously more research and development work needs to be done. The most important point of our review, however, has been a look at what really may be necessary to move e-learning forward. It is doubtful that the job of development and implementation can be left simply to teachers or trainers. They play an important role, to be sure, but as two major field of activity – education and technology – are converging. The roles needed to do this convergence justice need to be rethought. Even given the systemic constraints that may be present with the German educational system as a whole, there are nevertheless opportunities to explore the use of particular approaches, and we have considered eportfolios as one representative example.

The two primary threads addressed here – the growth of web access and the critical shift toward technology-enhanced learning – and the policy developments just mentioned – ECVET, ECTS, EQF – dovetail nicely toward the future. The time is auspicious for a more serious look at the practitioners who need to be involved in the design, development, and implementation of technology-enhanced learning, as some first contours are becoming clear. It is not simply a matter of making teachers fit to teach the 'net generation'. This is a sound and reasonable starting point, but there is now much more to be done. It is clear that teachers – in all educational institutions and organizations – need to be ware of the technologies involved and of the opportunities these may provide, if for no other reason than these technologies are here to stay and are becoming an ever more substantial part of the educational context. It has also become clear that dealing with e-technologies may be a larger field of activity than originally envisioned. Simply acquainting teachers (in all educational sectors) with the technology is an important first step, but it is certainly not the last step on the journey. There are a number of factors to be considered, both inside and outside the learning or training scenario that must be taken into consideration if e-learning is to become an efficient and effective learning and teaching approach. In the end, we are dealing with education, not just technology, and this necessary shift of emphasis requires a re-shifting of our thinking in both deeper and broader directions. Projects such as TeNeGEN have shown clearly what is involved in building a sound foundation for the future, but there is still a lot of building work ahead of us.

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LINKS TO RELEVANT COMPANIES, ASSOCIATIONS, AND INSTITUTIONS

The Bologna Process,
http://www.ond.vlaanderen.be/hogeronderwijs/bologna/

The Carnegie Foundation, *Gallery of Teaching and Learning* http://cms.carnegiefoundation.org/gallery_of_tl/keep_toolkit.html

Checkpoint-E-learning: E-TRAINER
http://www.checkpoint-elearning.de/etrainer/

The Copenhagen Process,
http://ec.europa.eu/education/vocational-education/doc1143_en.htm

E-learning in Europe
http://www.elearningeuropa.info/.

E-learning Portal of the European Commission
http://www.elearningeuropa.info/main/index.php?page=home

E-Learning-net.de
http://www.elearning-net.de/cms/front_content.php

European Association For Distance Learning
http://www.eadl.org/home.php

European Credit Transfer and Accumulation System (ECTS), http://ec.europa.eu/education/lifelong-learning-policy/doc48_en.htm

European Credit System for Vocational Education and Training (ECVET), http://ec.europa.eu/education/lifelong-learning-policy/doc50_en.htm

European Institute for E-Learning (EifEL),
http://www.europortfolio.org/

European Net-Trainers Association
http://www.nettrainers.org/en/index.asp?p=1-1

The European Qualifications Framework (EQF),
http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm

FernUniversität Hagen
http://www.fernuni-hagen.de/

Forum DistancE-Learning
http://www.forum-distance-learning.de/fdl_home.htm

Free University of Berlin
http://www.e-learning.fu-berlin.de/schulungen/e-teaching/index.html

Furtwangen University
http://www.hs-furtwangen.de/

Institut für Lern-Innovation
http://www.fim.uni-erlangen.de/en

JobScout 24 (German online job marketplace)
http://www.jobscout24.de/

Quality Initiative E-Learning in Germany
http://www.qed-info.de/index.php?option=com_frontpage&Itemid=1&lang=en

teletutoren.net
http://www.teletutoren.net/index.htm

Time4You, *Tele-Trainer, WBT-Author*
http://www.time4you.de/ibt/time4you/site/time4you/ibt/de/start.cxjsp?pos=overQualifications

University of Duisburg-Essen
http://www.uni-duisburg-essen.de/studienangebote/studienangebote_06698.shtml

University of Rostock
http://www.weiterbildung.uni-rostock.de/home.html?&L=

The William and Flora Hewlett Foundation *Past, Higher Education Projects: Pluralism and Unity, Liberal Arts Institutions, and General Education in Research Universities*
http://www.hewlett.org/Pro


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