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E-Learning in University Teaching

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Contents

Abstract

The dissemination strategy and the dissemination activities of the project are presentated in this chapter. All strategies and activities can be seen in line with the worldwide progression of E-Learning as a column of a universiy's teaching strategy. Within the project recording tools were used and evaluated. An online dissemination platform serves to spread project results among the academic community, the media, and enterprises.

1. Introduction

This workpackage is part of the project's dissemination strategy. It describes the projects dissemination goals and their realisation in special parts of the project web site, which were implemented for educational access. Here, all the educational offers are delivered in the dissemination phase, are multiplexed and made accessible for students participating in the educational axis of the project, such as M.Sc. programmes. This part of the project website is not only a platform for the partners, it is also a platform for professionals, for the media, for enterprise dimensions and post-graduates as well as teaching staff for the university dimension. Course material created during the project is accessible in a lot of formats like .pdf, .ppt., .doc etc. This dissemination part of the project is connected to general developments in the university teaching community.

We have to consider not only the chances that learning at universities gains with distance and net-based learning but also factors that oppose changes. And finally, we have to weigh up these different factors. Only in a long-term perspective the change of learning at universities will be drastic, in a medium-term perspective static factors will be too strong [Rol06].

One of the learning goals of universities all over the world is independent thinking, learning and working. In a virtual environment, learners could have all chances to develop these competences. Therefore E-Learning can change the work of students drastically [Det06].

- All of the functions of a university are likely to be available online: teaching and learning, administration, research, library, information about activities of the university, informal student life, assignments, etc.. This will facilitate learning at universities
- The learner will be independent of place and time. So that learners all over the world can become students, more independent of social circumstances.

  Learning will be more convenient than in traditional environments, because all information is only a few mouse clicks away.
- Learning can come closer to the research activities at universities. It will be easier to make ongoing research projects and results transparent to learners who are not directly involved.
- Multimedia applications will outstrip one-dimensional learning materials and teaching arrangements.

But despite these chances [Mau01] there are strong opposing factors that will restrain drastic changes of the learning at universities for a long time: the learners themselves, the organisational structure of the universities and the teaching staff [Rol06].

Distance and net-based learning require a new learning behaviour. The students have to be independent of the judgment of others. This is very difficult in the life situation of students who need judgement of a peer group and of elder persons to locate themselves in society. Virtual universities will hardly be able to replace this important function for the socialisation process during the first higher education.

- The virtual university also requires a change of the - partly - several hundred years old organisational structures, which are quite resistant to fundamental changes. Hierarchies, system of finance, division of work, demands for scientific work, learning architecture, etc. build a complex system with redundancies. Changes in one subsystem cause resistance.
- A change of learning requires a change of the teaching staff. But the thinking structures of the teaching staff are adapted to the organisational structure of universities and the traditional way of teaching. A new learning culture has to be anchored in the every day life both of learners and teachers.

For these opposing factors there will not be a drastic change in learning at universities in a medium-term perspective. But there will be a lot of little changes that provoke a conversion of the traditional structures:

Learning at universities will have many different forms. There will be a lot of combinations of distance/net-based learning and traditional classroom learning. This way learners, teachers and universities try to integrate some of the new opportunities in the old learning system.

- Learning in virtual environments will bring new opportunities for lifelong learning very fast. Learners in the field of further higher education will be offered more distance and net-based learning.

In a long-term perspective, these tendencies will more and more rebuild learning at universities and all the chances mentioned at the beginning will be developed. Learning at universities will become a lifelong opportunity. Universities will continue being the place for the first higher education but additional there will grow big departments of further education which use the opportunities of distance and net-based learning even more extensive. This evolution to a drastic change of learning at universities already started, and in different countries at different universities, you can see different stages of these developments [Jam06].

Places of higher education are currently enjoying greater autonomy and are clearly emphasising national and international competition in the fields of science and research. In recent years, this process of change has been supported by applying state-of-the-art information and communication technologies. Today E-Learning has emerged as essential feature of the modern university teaching landscape and is considered to be a profile-relevant performance criterion for universities.

To support an E-Learning process with the project partners, a twofold advancement was implemented. To record teaching events, a recording software was bought and spread to all project partners. To disseminate the recordings and additional teaching material, the Lecturnity Dissemination Center was implemented as part of the project web site.

2. Lecturnity Recording Software

The process of restructuring traditional models of teaching in favour of an integration of E-Learning has long since begun at all universities. Teaching events will be made available online in future increasingly, so that they can be accessed from anywhere and at any time. Lecturnity is a tool to record talks, lectures, seminars, etc. The speaker and his or her voice are recorded by a camera and a microphone. The speaker needs to use slides. Slides changes and annotations on the slides are recorded. For the student user the screen is divided into a slides section, where the changes of subseeding slides is shown, a video section, were a video of the author is synchronised with the slides and an overview section, were the slide titels are organised in the structure of a table of contents. A voice recording is also synchronised with the slides and the video. Questions in the audience can be recorded, if there is a second microphone synchronised and given as one audio stream to the Lecturnity system. For the production of a Lecturnity recording a video recording equipment and a sound recording equipment are necessary.

The Lecturnity recording tool is based on the approach of producing learning content by Lecture Recording. You can make use of the potential for knowledge transfer of material which is already available without making any changes: slides, hand-written annotations, animations and videos can all go into the production along with the spoken text and the didactic scenario of a genuine teaching event. Lecturnity was developed by IMC AG Germany [1] out of basic university research and is an example of the transfer of technology from academia to product-based research and development. The following posibilities are provided:

Recording of all data streams with only one tool

- Intuitive user interface
- Lecturer can keep his classic way of lecture
- Flexible output formats of recordings
- Flexible electronic distribution of E-Lectures via CD-ROM, DVD, FTP, Streaming
- Editing (cut, copy and paste) of Lecturnity-Recordings possible
- Wide range of imaginable asynchronous learning-scenarios

For the preparation of a recording MS Powerpoint slides have to be converted by the lecturnity tool. A life recording catched the lesson. During a post-processing procedure the adequate output formats are created. The complete effort for the production of a high quality recording of a 90 minutes lecture with three different output formats (with video, without

[1] http://www.im-c.de/

video, streaming format) sums up to 1,5 man-days. The complete effort for the production of a low quality non-video version in a proprietary Lecturnity output format sums up to 0,5 man days.

2.1. Lecturnity Usability Questionnaire

To discover, wether there are differences due to culture in the perception of the recording technology in comparable settings, a questionnaire was developped and evaluated. Questions concerning settings, advantages and disadvantages of the tool lecturnity were compilated. The Questionnaire was distributed to Lecturnity users of all partners. It is an instrument designed for exploring information about preferences and dislikes of the student users and the authors. All partners were requested to answer the same questions. Completed questionnaires were checked for connections between preferences and dislikes on the one hand and national cultures on the other hand. If there should occur certain preferences or dislikes in one country, this can be a hint to a cultural influence on the perception of the lecturnity tool. Further scrutiny of such a difference would be focussed to the reasons of the the differences.

Questionnaires of similar design were distributed to student users and authors as seperated groups. This will show, whether the actual design of the tool is percepted in different ways by the different groups. If there are different perceptions in comparable teaching scenarios, the next step would be to compare the nationalities within each group. This can lead to information about cultural bound differences within the groups of student users and authors.

The first distribution was sent to the seniors of the project partners. The Lecturnity Software was new for all teaching senior project partners. They were prepared by httc staff in the same way and had a comparable background of information and training.

Everybody used the software within the local teaching scenario for about two months. During this phase an e-mail discussion of weak and strong features of the tool Lecturnity took place. After a phase of experience-gaining of two months, the questionnaire was sent to the authors. The comments in the questionnaires showed some perseption features which were shared by all authors. Other perseption features differed between the authors.

Two features of the tool were valued as obstacles for enhanced E-Learning by all partners:

- Recordings covering a term longer than 15 minutes showed an increasing missynchronisation of text and video-streams. Discrepancies became notable after appr. 10 minutes and reached an unaceptable dimension after appr. 15 minutes.
- Animations like flash films within a powerpoint slides could not be preserved as animations within the slides. The video stream had to be substituted by the animation. It was not possible to show both - video and animation - on the students screens.

The perception of usability was mainly influenced by the personal teaching style of the teachers. Lectures by IIT-C are characterised by a teacher walking up and down in front of a big blackboard with lively gestures and writing on the board with chalk to illustrate the the lecture. There were also many elements of dialogue between teacher and students. The

dialogue elements could not be preserved by the Lecturnity software. IIT-C used Lecturnity mainly for the recording of phd talks, not within the setting of lectures or dialoge dominated exercises. Lectures were recorded by a video camera, which was permanently operated by a person following the movements of the teacher. Video tapes can be borrowed by students.

The perception of usability in IIT-K was also strongly influenced by the pre-existing infrastructure in the institute: Lectures were recorded in three prepared studios. The lecturer is recorded by four cameras. They capture the lecturer, slides conveyed by a beamer, or writing on paper sheets conveyed by a ceiling camera and a beamer. The four streams are edited on the fly. They can be broadcasted or stored. This estabilshed system was not changed by the use of Lecturnity. Lecturnity was applied for recordings of phd talks. Within this scenario the obstacle concerning powerpoint animations was estimated as main constraint for extended use. In comparison to the established recording system at IIT-K, Lecturnity showed one feature which was regarded as a main strength: Video and slides both can be seen constantly. The IIT-K system offered either the video or the slides.

UNI-MD stated also limited editing features concerning slides animations and critisized synchronisation problems in long time recording (more than 15 minutes without break). Like by IIT-C, a limitation in presentation stile (gestures, walking) was mentioned as a main obstacle for long time recordings. Positive impacts of the tool were discovered in scenarios of software demonstrations using the screengrabber mode for recording webserver activities. No additional hardware had to be transported, which was a clear improvement for the organisational point of view. Lecturnity was also useful for enriching a lecture with short time recordings of limited scope.

httc did not use Lecturnity for recordings of complete lectures, but for recordings of relatively short presentations of single topics. A set of short recordings covered more extensive subject matters. Animations were not used in powerpoint slides. The chosen stile of minimalistic slide design caused no perfomance problems. A minimalistic design of the slides was a didactical decision due to the intention of utmost clarity in presentation.

As main results, the seniors of the project partners stated similar fortes and weaknesses of the tool. Constraints for free movement of the lecturer and contraints of recording duration were predominant in the perception of the tool. Within the group of authors/teachers no national or cultural bound differences could be detected concerning the weaknesses of Lecturnity. Concerning the fortes of the tool also no differences due to the cultural background could be detected. The use of lecturnity was dominated by objective circumstances in the different institutes and the features of the tool. There was no hint, that comparable features were percepted in different ways within comparable teaching scenarios. All seniors tended to use Lecturnity for short time recordings of limited scope.

2.2. First Questionnaire: Point of View of Students

The students completed a form with the following questions:

In which way did you profit from using the recording?

Which features of the recording were helpful for a better understanding of the recording´s

subject matter?

Which features of the recording had a negative effect on the understanding of the recording´s subject matter?

Which features of the recording were more helpful than in comparison to a traditional study support?

Which features of the recording were less helpful in comparison to a traditional study support?

What did you miss in comparison to a traditional study report?

Which features of the recording were helpful to enhance your learning?

2.3. Second Questionnaire: Point of View of Authors and Teachers

The authors and teachers completed a form with the following questions:

In which way did you profit from using the tool?

Which features of the tool were helpful for a better understanding of the recording´s subject matter?

Which features of the tool had a negative effect on the study support?

Which features of the tool were more helpful in comparison to a traditional study support?

Which features of the tool were less helpful in comparison to a traditional study support?

What did you miss in comparison to a traditional study report?

Which features of the tool were helpful to enhance your teaching?

Which constraints of the recording led to obstacles for your teaching?

3. From CLIX to Lecturnity Dissemination Center

One of the central requirements placed on a learning management system is the organisation of learning processes. It is possible to publish events like lectures, practicals and seminars in event catalogues, thus providing access to those events and the relevant learning materials (e.g. exercise sheets). Individual teaching contents, such as lecture notes, interactive learning modules, animations, simulations, tests and feedback questionnaires are brought together in events. Within events, curricula can be freely defined. Explorative learning scenarios are possible, as well as adaptive, tutorially mentored learning paths. Communication and collaboration between learning groups are supported by an extensive range of tools (mail, chats, forums, virtual classrooms, whiteboards, etc.). All platform activities remain system-controlled and can be assessed via a wide selection of reports. These goals can be realised by the following funcionalities:

Training measure management: Combines a range of different courses and teaching events to training programmes.

Course management: Generates individual teaching plans and defines learning logics

Workflow and messaging management: Develops appropriate workflow and messaging processes adapted to your organisational needs.

Tutor centre: Administers trainers, teachers, courses, participants and learning processes.

Communication and collaboration: Uses communities to enable online communication between participants in learning events and integrates functions such as chats, forums, libraries and mail-based communication into curricula-driven learning processes.

Adequate training and teaching is not possible without learning contents. The Learning Management System CLIX provides an all-round autonomous learning content management system supporting all kinds of training contents, ranging from MS PowerPoint slides, training scripts and E-Learning modules to interactive tests. The dedicated system database facilitates the administration, adaptation and publication of a wide range of learning objects. Compliance to internationally recognised standards, such as Dublin Core, LOM, AICC or SCORM ensures smooth integration of externally provided learning contents. Wizards support the production of tests, feedback questionnaires or glossaries. Programmes aimed at further training or internal communication measures can be published and acquired in the system via portals. Within courses, learning components can be defined and structured via learning logics.

The ability to model individual organisational structures is a key strength in any learning management system. CLIX domain, group and user management gives the option of grouping the addressees of learning contents by organisational groups and to assign them to appropriate users. High-performance access rights management allow to channel knowledge and information to the appropriate addressees and provide protection where confidentiality is an issue. User-friendly system functions, such as component and licence management, enable maintenance and administration to be kept within the organisation, thus avoiding extra costs. Such a number of functionalities locates the CLIX System in a transitional position from a Learning Management System to a Content Management System, because it provides functionalities for course creation as well as functionalities for storage and administration of learning material [Pet04].

This multitude of functionalities turned out to be a technical overkill in comparison with the project partners goals. Discussion with the project partners led to a simplified version of CLIX. The simplified version is called the "Lecturnity Dissemination Center". htte set up a version, which is designed for the specific needs of the project partners. The version for the project is based on the CLIX lerning management system.

The workflow for users of the Lecturnity Dissemination Center has been tailored to be as intuitiv and simple as possible. Goal of the design was to attract as less attention to the handling of the systeme as possible.

A login system grants access only to registered project members (see fig.1: Login Page). Project members are entitled to disseminate the material within the Lecturnity Dissemination Center for their purposes.

After the login procedure the project members will find their access to the Lecturnity Dis-

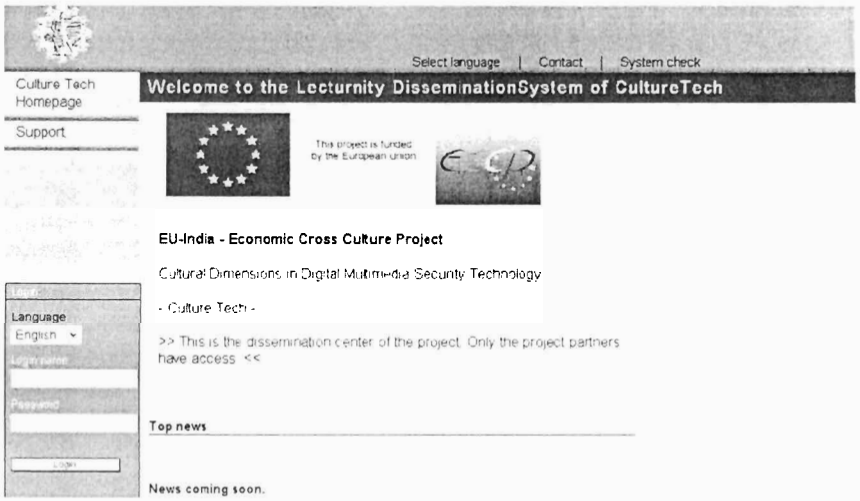

Figure 1.: Login Page

semination Center. In a news section they can get information about the latest uploaded recordings (see fig. 2: Personal Desktop).

After entering the Lecturnity Dissemination Center, the available recordings can be reached in the document archive. All documents are organised according to the project´s workpackages (see fig. 3: Document Archive).

Figure 2.: Personal Desktop

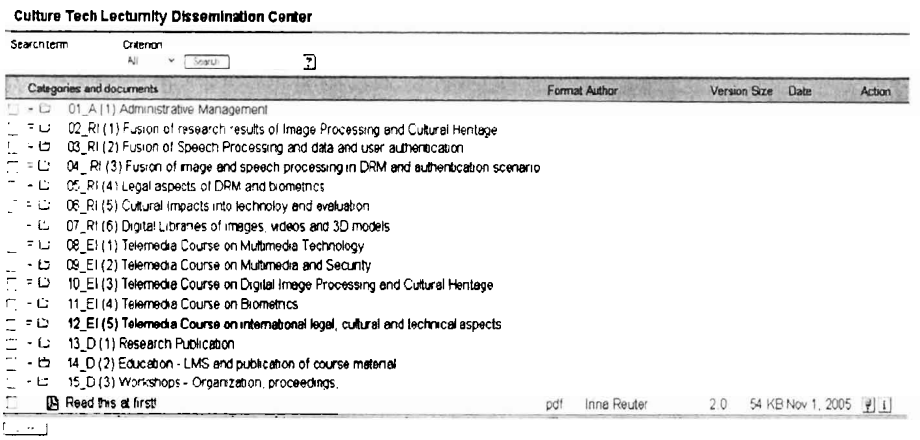

Figure 3.: Document Archive

Uploading a new recording is simply done by pressing a button "new document" on the top of the document archive page .

Then a small number of metadata has to be inserted in an electronic form. The new recording must be named, a short decription and a short comment should be added for a quick overview in the document list. Information about the author and keywords describing the content complete the set of metadata, which allows a clear organisation and search within the document archive.

4. Course Material on the Project Web Site

Organised course material is available on the project web site. Papers, lecture slides, scripts, recordings of lectures and recordings of talks can be found on the projects website.

Course material is available in the following categories

- Image Processing and Cultural Heritage
- Speech Processing and Data and User Authentication

  Image and Speech processing in DRM and Authentication Scenarios

  Legal Aspects of DRM and Biometrics

  Cultural Impacts into Technology and Evaluation
- Digital Libraries of Images, Videos and 3D Models

The course material can be found here: https://amsl-smb.cs.uni-magdeburg.de/culturetech/

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