CLASSROOM 2000   -   DESCRIPTION

Motivation

The striking technological changes have a strong impact on the engineering sciences, especially in the field of computer science and telecommunication. Lifelong learning for the engineers becomes a first priority importance. This development will be accentuated by the increasing international interdependence and through growing global networks. This evolution of our society obviously has great influence on education systems. New forms of learning and teaching will replace soon conventional teacher directed education. CLASSROOM 2000 aims to take actively part at this evolution in a comprehensive way.
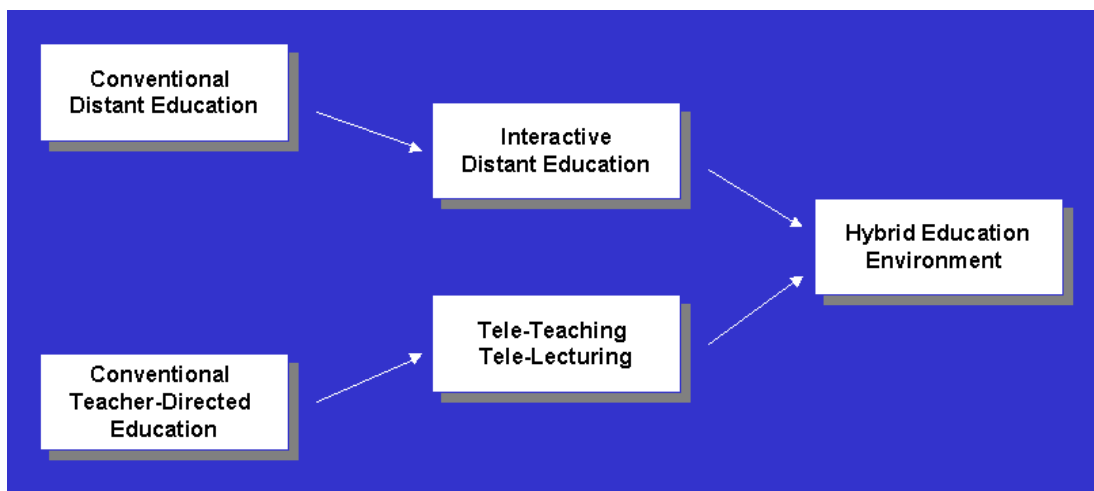

Figure 1: Projected evolution of the learning environment.

The evolution of the learning environment projected by us pursues a double stage concept (figure 1):

- On the one hand conventional distant education will be replaced or complemented by interactive distant education. The characteristic feature of the conventional distant education consists in the fact that learning and practice material is sent at regular intervals to the students in written form. Learning success is then also determined via written correspondence. Within interactive distant education, communication is done by modern technology possibilities, how about email, Videoconferencing, Document sharing, Internet, and so on.
- On the other hand we are on complementing the conventional teacher directed head on education by Tele-Teaching and Tele-Lecturing. That is the direct and synchronous transfer of classroom situations from one lecture hall to one or several others.

In the future we will define a so-called hybrid education environment, in which the most appropriate learning environment will be applied depending on the situation.

General objectives CLASSROOM 2000

The research and development project CLASSROOM 2000 was started in November 1997 and marks the structural, technological, and didactical framework for the implementing of new learning technologies in the form of modular courses for engineers and technicians. The project is under the scientific management of the Swiss Federal Institute of Technologies Lausanne (EPFL), co-ordinated by NDIT/FPIT and realized by a consortium of Swiss universities, universities of applied science and companies. CLASSROOM 2000 is funded partially by the Swiss National Science Foundation (grant no. 5003-51362) for two years. The research results are tested and evaluated within the education program of NDIT/FPIT and other educational institutions.

The main objectives of CLASSROOM 2000 in detail read as follows:

- The development of an authoring system for the purpose of efficient and sustainable integration of new computer-based teachware (CBT, simulation, information search methods, virtual lab and so on) into the instruction and learning processes.
- The development of a consultation, examination and evaluation concept for a virtual classroom considering ergonomic, pedagogic, technological and economic aspects.
- Running pilot courses within the NDIT/FPIT postgraduate course program applying, testing and evaluating the corresponding research results.
- The development and the improvement of existing postgraduate formation and professional training in the field of new information technology. We thus want to promote the rapid dissemination of new investigation and new skills in industry, economy and society.

We finally support actively the connection of Swiss project work and the resultant training programs to similar European projects. The further development of course modules as well as their integration into an European master diploma in computer science and telecommunication is an example of a possible co-operation.

Project Partners

Within CLASSROOM 2000 we are working together with a great diversity of partners mentioned at the following list:

Universities:

- Ecole Polytechnique Fédérale de Lausanne (EPFL)
- Université de Fribourg
- Eidgenössische Technische Hochschule Zürich (ETHZ)
- Universität Bern

Small and medium enterprises:

- MasterEye AG Egerkingen
- APEX Conseillers d'Entreprise Vevey
- ERGOMEDIA AG Zürich
- Xinnovation AG

Universities of Applied Sciences – Technical Colleges:

- Ecole d'Ingénieurs de Fribourg (EIF)
- NDIT/FPIT Bern
- Hochschule für Technik und Architektur Bern (HTA BE)
- European Study Centre (ESC) Brig

Private Education Institutes:

- AKAD Zürich
- IBZ Brugg

Project Environment

It is obvious that daily work requires a certain structure in a project that consists on such a heterogeneous partnership, as it is in CLASSROOM 2000 project. In this sense we first defined a coherent work package for every project partner containing a minimum of interfaces with other work packages. This way we are able to minimize the organizational overhead in our project (figure 2).

In every work package the user requirements have to be investigated by the involved partner. This enables the WP-Team to adequately design, develop, evaluate and use the necessary tool for the project work, which continually will be tested while building and running pilot courses. The corresponding research results will be summarized and integrated in the future HEURIS information system, which will be accessible by public. In this way, we are creating an environment for an efficient dissemination of our project results.

With great priority, we are working on pedagogical and social aspects at every project level because only this way we efficiently may increase the acceptance of the corresponding user. We therefore carry out pedagogic evaluations in all project phases (design, implementation, test and running phase).

The subdivision of the research fields into small work packages contains the danger that the research results develop apart. In order to minimize this danger we built up a communication structure managed by NDIT/FPIT as CLASSROOM 2000 co-ordination center.
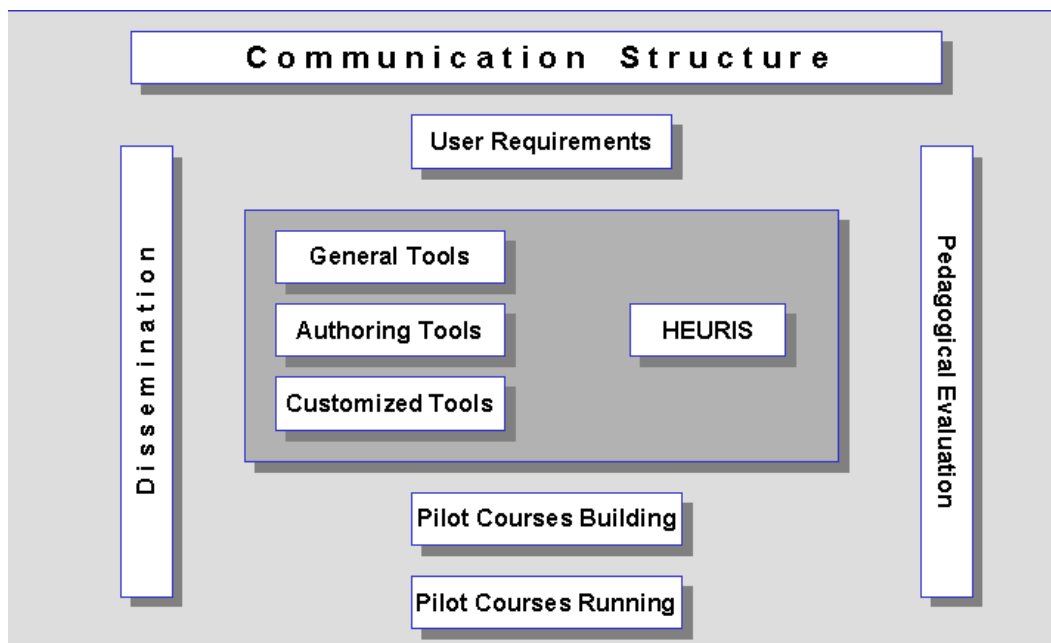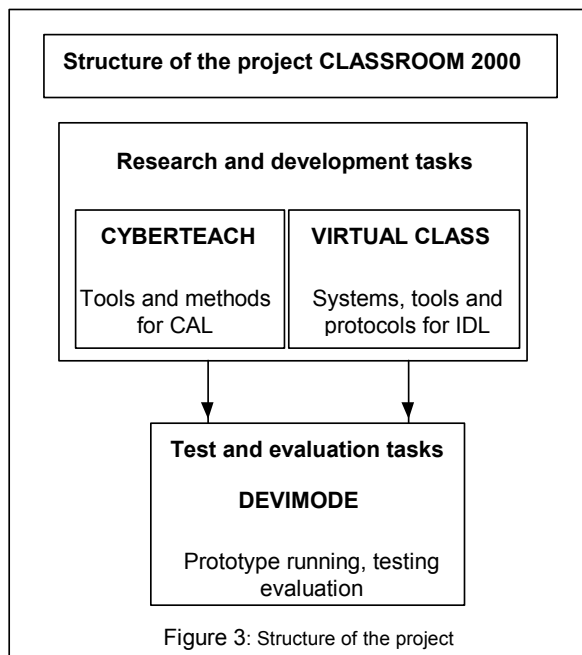

Figure 2: Project environment.

Organisational structure of CLASSROOM 2000

Structure of the project CLASSROOM 2000

Research and development tasks

CYBERTEACH

Tools and methods for CAL

VIRTUAL CLASS

Systems, tools and protocols for IDL

Test and evaluation tasks

DEVIMODE

Prototype running, testing evaluation

Figure 3: Structure of the project

The work packages of CLASSROOM 2000 project are integrated into three subprojects, the two research and development projects CYBERTEACH and VIRTUAL CLASS as well as the test and evaluation project DEVIMODE (figure 3).

CYBERTEACH deals with research and development in the field of computer assisted learning (CAL). Concretely CYBERTEACH works on development and application of authoring tools and on the realization of a remote control systems for a tele-laboratory. Its main focus is the production of teachware and the generation of support and preparation tools for courses.

VIRTUAL CLASS focuses on the implementation of tools, processing protocols and methods to obtain a consistent course curriculum considering ergonomic, pedagogical and economical aspects. The main scope of VIRTUAL CLASS is Interactive Distant Learning (IDL), that means learning by application of new forms of synchronous or asynchronous communication[1] and the optimal use of new forms of teachware.

DEVIMODE serves as an extended test area for the two other subprojects. The main objective of DEVIMODE is to use and to evaluate corresponding results.

Main project: CLASSROOM 2000:

- Scientific project-leader: Prof. Dr. Giovanni Coray, Institute of computer science, Swiss Federal Institute of Technology, Lausanne.
- Technical coordination: Prof. Philippe Joye (School of Engineering, Fribourg)
- Project-coordination and management: Dr. Federico Flückiger, NDIT / FPIT, Bern

Subproject: CYBERTEACH:

- Scientific leader: Dr. Christine Vanoirbeek, Institute of computer science, Swiss Federal Institute of Technology, Lausanne.

Subproject: VIRTUAL CLASS:

- Scientific leader for the pedagogical and tutoring aspects: Prof. Dr. Jean-Luc Gurtner, Institute of Education, University of Fribourg
- Scientific leader for the system architecture and the technological aspects: Prof. Antoine Delley, Départment de télécommunication, Ecole d'Ingénieurs, Fribourg

Subproject: DEVIMODE:

- Scientific leader: Dr. Andreas Ninck, HTA BE, computer science department, Bern

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[1] We understand video conferencing, application sharing, chat, remote control of technical equipment, etc. by synchronous communications and WWW, e-mail, forum, file transfer, etc. by asynchronous communications.

The CLASSROOM 2000 is a necessary but also ambitious project which includes a quite wide field of interdependent research, development, organization and evaluation tasks. To handle the intrinsic complexity we have structured the whole project in three modular subprojects with clearly delimitated work packages. Most of the work packages are defined in a way that they mostly can be worked out in parallel. Nevertheless inter-work-package-co-operations are welcome and will be supported.

It is foreseen to develop all the planned technological and pedagogical elements at the involved partner institutions and to exchange them as soon as working versions are available.

General work package of CLASSROOM 2000

WP CR: Project management

Objective

One of the strength but also a potential source of difficulties of this project is the relative large community of contributors. For this reason we have allocated some substantial personal and infrastructural resources for this task. The objective of the project management is to guarantee that all work completed within the subprojects and work packages is done in an effective and efficient way to reach the general goals of the CLASSROOM 2000 project. An additional objective is to prepare a Swiss consortium for the collaboration within the large European project collaborations once this participation will be opened again (conclusion of the corresponding bilateral treaties between the EU and Switzerland).

Tasks / deliverables

1. Setup an effective organizational structure that allows and fosters the effective collaboration between the contributing partners working on the different work packages. This includes the definition and coordination of processes, interfaces between work packages and work schedules.
2. Setup and assure the communication infrastructure and coordination between the project partners and other institutions involved.
3. Assure the quality management, the necessary technical standardization and the project controlling.
4. Serve as information center and switchboard for developers and users of the work package outputs.
5. Assure and organize a regular reporting within the collaboration and towards the project founders.
6. Establish and maintain international connections, information and knowledge exchange with similar R&D-projects in Europe.
7. Establish an operational organization and communication infrastructure suitable for the participation in large European projects.

Methods

A project manager (70 %) cares about the project management. His first task will be the elaboration of organization diagrams, realization concepts, function diagrams and process schedules for the running of the project, the subprojects and the work packages in close collaboration with the involved partner institutions. Protocols for the quality management, the technical standards and platforms to be used will be worked out. The already established international connections will be reinforced through the intended participation in projects of the 5th European Framework Program 'User-friendly information society'.

Milestones

CLASSROOM 2000	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP CR (Project-co-ordination / project-management)																													
NDIT / FPIT	1																												2

1. Completed setup of a project management office, the communicational infrastructure and drafts for organization diagrams, concepts and protocols
   Semiannual: Project reporting within a main collaboration meeting
   Every month: Subproject meetings (video conferences)
   Every year: Organization of a public presentation of achieved project results

2. Final project report

⇒ Additional activity: Organization of an annual international conference on new learning technologies.
   12.6.1998:   Ecole d'Ingénieurs Fribourg (EIF)
   30-31.8.1999:   University of Berne

CYBERTEACH

(Tools and methods for the implementation of computer supported teachware and course development with computer learning elements)

General objectives of CYBERTEACH

The technological evolution in the domain of information and communication has opened new possibilities of applications for learning and teaching purposes.[2] These new possibilities need to be tested and adapted to the needs of a computer aided learning (CAL) environment. Main new such functions are:

- rapid or even interactive access to large knowledge bases (scientific databases, bibliographic searches, interactive information centers etc),
- computer aided learning environments (active and structured documents with integrated graphical and multimedia objects, interactive and well structured CBTs, services for computer supported cooperative work CSCW, intelligent tutoring systems, simulations, virtual reality etc.)

These applications and services cover most of the technical needs to define an effective learning environment for a broad range of courses, studies or educational programs with scientific, technical or economical contents. Still underdeveloped however are concepts and methods to use the new technological possibilities in an effective and efficient way for interactive distant learning and the dissemination of specialized knowledge with didactical and pedagogical acceptable and efficient methods. Only a careful selection of useful technological features and possibilities assembled in a coherent and consistent way provides benefits to an interactive distant learning environment. To obtain a well equipped virtual classroom, substantial methodological and conceptual work and synthesis of these concepts within technical solutions have still to be done. This will be the objective of CYBERTEACH.

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[2] Hochschulrektorenkonferenz; Moderne Informations- und Kommunikationstechnologien (Neue Medien) in der Hochschullehre, Dokumente zur Hochschulreform 111/1996

The main scientific objectives for CYBERTEACH are

- to elaborate a detailed analysis of the user needs for the interactive distant learning (IDL) based on the experiences of students and tutors which have participated in already held prototype courses in the virtual classroom
- to prepare and develop CAL tools and support services for the realization of new courses or the transformation of existing traditional courses into at least partially distributed courses in a virtual classroom
- to provide tools, services and implementation support for the running of a series of demonstration courses as empirical test laboratory.

The practical objective is

- to distribute the CYBERTEACH-environment for the setup of CAL environments for virtual classroom courses in postgraduate study programs (engineers) and in higher professional training courses (technicians) for beta testing purposes

The methodological objectives are

- to adopt a user and market oriented work approach
- to permanently test and evaluate concepts, tools and methods in repetitive runs of prototype virtual classroom courses
- to segment the CYBERTEACH environment in independent running application work packages for the development and maintenance
- to use standard technology and development tools to avoid proprietary and costly solutions
- to (re)use already available teachware and provide an intelligent information center for the search of adequate CBTs and tutorials linked to the worlds most important electronic teachware libraries
- to define an open system, which eases the introduction of new tools and elements (proprietary and closed solutions shall be avoided as much as possible).

Organisational structure of CYBERTEACH

The following institutions will participate in CYBERTEACH:

- Swiss Federal Institute of Technology, Lausanne
  (Project-manager of CYBERTEACH: Dr. Christine Vanoirbeek)
- School of Engineering, Fribourg
- MaserEye AG, Egerkingen
- (TWI Polytechnic School of Engineering, Winterthur)

Work Packages of CYBERTEACH (Deliverables):

WP CT 1:   Simulations / Virtual laboratory

1. Development of an adequate simulation tool for the specific educational need of engineers (TWINS-project)
2. Design a prototype of a specific virtual laboratory

Involved partners:
- TWI Polytechnic School of Engineering, Winterthur

Contact person: Thomas Haller
                     TWI Polytechnic School of Engineering, Winterthur

Milestones

CYBERTEACH	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP CT 1 (Simulations / virtual laboratory)																													
Technikum Winterthur (TWI)																													

- This work package is not running within CR2000 project, because TWI had to change initially planned ways of investigation due to financial reasons (project is supported by KTI not by SNF).

- A loose co-operation between TWI and CR2000 remains: TWI participate actively at our annual conferences.

WP CT 2: Telelaboratory

1. Develop a concept which enables an unified virtual access to test equipment (e.g. protocol analysers, radio frequency or satellite measurement equipment, network analysers).
2. Provide access and analysis solutions for the most frequently used environments (Lab View, HP VEE, UNIX, DOS/Windows)
3. Develop SW packages for user interface, server and equipment control via a public network.

Involved partners:
- School of Engineering, Fribourg

Contact person: Prof. Philippe Joye
School of Engineering, Fribourg

Milestones

CYBERTEACH	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP CT 2 (Tele-laboratory)																													
Ecole d'Ingénieurs Fribourg (EIF)			1					2					3					4			5								

1. First investigations for Tele-laboratory
2. 2. quarter '98: Analysis of user requirements
3. 4. quarter '98: Concept definition
4. May '99: First Tele-Laboratory tools available,
5. 1999: Test in different NDIT course modules

$\Rightarrow$ Additional activity: Successful co-operation between WP CT 2 and WP CT 3 (Set-up interface document enabling internet access to the tele-laboratory).

$\Rightarrow$ Additional activity: Successful co-operation between WP CT 2 and WP VC 2a (Additional application of communication concepts within tele-laboratory).

WP CT 3: Autoring Systems

a.) Multimedia Environment for Distributed Interactive Teaching

1. Design and production of a specific authoring environment focussed on the specified needs of engineering training
2. Implementation and interfacing selected tools
3. Integration of developed tools into a virtual learning environment
4. Validation of the prototype and teaching environment

Involved partners:
- Swiss Federal Institute of Technology, Lausanne
- Master Eye, Egerkingen

Contact person: Dr. Christine Vanoirbeek
EPF Lausanne (Institut de l'Informatique)

b.) Tools for tutors and for administrational purposes

1. Realize a CBT-information and selection tool and a specific user-oriented service
2. Integration of new developed tools into a computer-assisted learning (CAL)-environment and clearly define the areas of contact (text, toolbook etc.)
3. Develope tools for an easy administrational handling of the CAL-environment

Involved partners:
- Modern Learning Technologies MLT
- PTT Telecom

Contact person: Dr. Rolf Ammann
Modern Learning Technologies, MLT (Biel)

Milestones

CYBERTEACH	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP CT 3 (Autoring systems / tools for tutors and administrational purposes)																													
a.) EPF Lausanne			6							7						8								9					10
b.) MLT / Swisscom																													

WP CT 3a:

6. Jan. '98: Design of the environment architecture
7. Oct. '98: Implementation of the editing and document administration tools
8. Apr. '99: Implementation of the monitoring tools
9. Oct. '99: Integration of the environment
10. Until project end: Validation and feedback

⇒ Additional activity: Successful co-operation between WP CT 3 and WP CT 2 (Set-up interface document enabling internet access to the tele-laboratory).

⇒ Additional activity: Successful co-operation between WP CT 3 and WP VC 1 (Pedagogical evaluation of MEDIT).

⇒ Additional activity: Successful co-operation between WP CT 3 and WP DE 3 (Set-up HEURIS prototype).

$\Rightarrow$ Additional activity: Successful co-operation between WP CT 3, MasterEye Ltd. and Xinnovation Ltd. (Set-up authoring tool 'Course Designer').

WP CT 3b:

- MLT has closed its activities by end of 1997 due to management decision of Swisscom - work package was cancelled.
- Tasks have been partially taken into account within new work-package WP DE 3.

VIRTUAL CLASS

(Development of protocols and a system architecture for the running of courses in a virtual learning environment)

General objectives of VIRTUAL CLASS

The development of a CAL environment does not guarantee by itself that learners can take the expected benefit from the use of the modern technological and interactive learning possibilities. The new tools need to be embedded into an overall concept which defines how virtual courses can efficiently and effectively be run. Protocols concerning the running of courses in a virtual learning environment have to be developed, in order to assure the efficient handling of these new tools. The setup of an inexpensive working place for students and tutors in the virtual classroom and the development of adapted specific user-protocols will be the main objectives of the sub-project VIRTUAL CLASS.

The scientific objectives of VIRTUAL CLASS are

- to plan and realize an adequate system architecture for the effective and user-oriented implementation of the developed tools into a virtual learning environment.
- to set up adequate equipped working places and appropriate protocols for the running of courses, tutor sessions, computer assisted exercises and assessments.
- to include a server-client concept for the sharing of application and training resources.
- to further develop interactive distant learning through inexpensive tele-cooperation (bi-directional video conferences, remote application sharing, Email, electronic blackboard, electronic discussion groups, remote equipment control etc.).
- to develop a pedagogical concept for the setup of course curricula which allow an effective and efficient dissemination in the virtual classroom
- to establish a tutoring and advisor concept for the optimized coaching of students in courses with interactive distant learning
- to develop a tutoring and advisor handbook that deals with didactical and methodical aspects of the learning process within a virtual learning environment (Framework-book for the setup of course curriculum)
- to set up an evaluation concept with adequate tools and a benchmarking system to measure the effectiveness and the efficiency of the learning process within such a virtual classroom.
- to develop a concept and adequate tools for the establishment of an improved internet based communication (CMC) between students and tutors.
- to develop an assessment system which allows the submission of exercises and tests in a virtual class environment

The economical objectives of VIRTUAL CLASS are

- to develop a cost efficient running model for virtual classroom courses.

Organizational structure of VIRTUAL CLASS

The following institutions will participate in VIRTUAL CLASS:
- University of Fribourg (Project-manager of the pedagogical aspects of VIRTUAL CLASS: Prof. Dr. Jean-Luc Gurtner)
- School of Engineering, Fribourg (Project-manager of the technological aspects of VIRTUAL CLASS: Prof. Antoine Delley)
- ERGOMEDIA Zürich
- Swiss Federal Institute of Technology, Zürich
- Swiss Federal Institute of Technology, Lausanne
- Zentrum für universitäre Fernstudien Schweiz, Euro Study Center Brig

Work Packages of VIRTUAL CLASS (Deliverables):

WP VC 1: Didactical and assessment aspects within VC / Evaluation of efficiency and effectivity of the learning process in VC

Within this work package, three complementary parts will be carried out, dealing with different didactical aspects for IDL in a VC. They are described in details below:

Overall:
1. Handbook with didactical framework for the transformation of conventional classes into VC
2. Tool for assessment and evaluation within a VC
3. Scientific evaluation of specific didactical and methodological aspects concerning efficiency and effectivity

a.) Pedagogical and social aspects within VC
1. Definition of a pedagogical concept for VC
2. Guidelines for the development of appropriate course settings which facilitate between learners interactions

Involved partners:
- University of Fribourg

Contact person: Prof. Jean-Luc Gurtner
Institute of Education, University of Friburg.

b.) Didactical concept for learning in a VC
- Definition of a didactical concept for the use of VC; setup, run and evaluation of a VC according to this concept
  - Definition of a didactic concept for computer based distant learning.
  - Verification of the defined concept using a virtual classroom.
  - Building up a didactic guide for virtual classrooms.

c.) Evaluation of ATM-based videoconferences in the context of higher education

- Tool for assessment and evaluation tasks within VC

Involved partners:
- ETH Zürich (Computer Engineering and Networks Laboratory, TIK; Center for Teaching and Learning, DiZ)
- EPF Lausanne (The European Inter-university Association on Society, Science & Technology, ESST)

Contact Persons: Dr. Hans Hänni
                    Center for Teaching and Learning, ETH Zürich
                    Dr. Pierre Rossel
                    EPFL/ESST

Milestones

VIRTUAL CLASS	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP VC 1 (didactical / assessment aspects)																													
a.) Uni Fribourg										4		1			5							6		2					3/7
b.) Ergomedia / ETHZ / MLT																													
c.) ETH Zürich / EPF Lausanne	8										9																		

WP VC 1a:

1. Intermediate report on phase 1
2. intermediate report on phase 2
3. final report with guidelines included

$\Rightarrow$ Additional activities: Tasks previewed within WP VC 1b:
4. An analysis of user requirements will be undertaken.
5. A didactic concept for a virtual classroom will be defined.
6. Experimental set up
7. A set of didactic rules for virtual classrooms will be defined. (Report)

$\Rightarrow$ Additional activity: Successful co-operation between WP VC 1 and WP CT 3 (Pedagogical evaluation of MEDIT).

WP VC 1b:

- MLT has closed its activities by end of 1997 due to management decision of Swisscom.
- Ergomedia and ETHZ renounced its initially interest in an active participation at this work package.
- A loose co-operation between Ergomedia and CR2000 remains: Ergomedia participate actively at VC-meetings and at our annual conferences.
- Tasks have been taken into account within WP VC 1a and partially within WP DE 1a.

WP VC 1c:

8. Summer term '97: Transmission and evaluation of post graduate course between ETHZ and EPFL; international transmissions planned for 1997
9. Winter term '97/98: Transmission and evaluation of undergraduate math course between ETHZ and EPFL

$\Rightarrow$ Additional activity: Transmission and evaluation of undergraduate pharma course between ETHZ and Uni Basel.

WP VC 2:   Communication   in   a   virtual   learning   design   /   student counseling

Within this work package, three complementary parts will be carried out, dealing with different communication aspects for IDL in a VC. They are described in details below:

a.)   Communication system

- Develop a multisite-multisite communication structure and adequate user protocols to overcome lacks of low bandwidth ISDN connections within the VC
- Generate concept and tools for an adequate coaching of the students by the tutors.
- Define and setup an adequate system architecture for a distributed server client system as technological basis for a CAL-environment.

Involved partners:
- School of Engineering, Fribourg
- Studienzentrum Schweiz der AKAD-Hochschulen für Berufstätige, Zürich (only if demand is required: see „letter of intent" Annex)

Contact person: Prof. Antoine Delley
                     School of Engineering, Fribourg

b.)   Tools for communication and for student counseling

1. Set up concept for student counseling service in VC (Organizational counseling, individual study planing counseling)
2. Concept for an introduction-course into VC for potential course organizers
3. Guideline for adequate working methods in VC

c.)   Concept for self-controlling

- Concept for self-controlling methods and self distillation for the learning process in VC

Milestones

VIRTUAL CLASS	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	99 12	01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP VC 2 (Communication / student counseling)																													
a.) Ecole d'Ingénieurs Fribourg	1	2						3				4																	
b.) MLT / Swisscom																													
c.) Euro Study Center Brig																													

WP VC 2a:

1. 3. quarter 1997: Definition of two or three new communication configurations
2. Nov. 1997 – Jan 1998: evaluation of one of these configurations in the NDIT virtual course module "ATM – broad band networks" (same subject as in the pilot course)
3. 2. quarter 1998: Refinement of the configuration
4. 3. quarter 1998 and up: further evaluations and refinements

⇒ Additional activity: Successful co-operation between WP VC 2a and WP CT 2 (Additional application of communication concepts within tele-laboratory).

WP VC 2b:

- MLT has closed its activities by end of 1997 due to management decision of Swisscom - work package was cancelled.
- Tasks have been partially taken into account within new work-package WP DE 3.

WP VC 2c:

- Work package not running due to lack of resources at ESC Brig (other work of high priority).
- Tasks have been partly taken into account within work package WP VC 1a and WP DE 3
- Since January 99, Andreas Röllinghoff (free collaborator at ESC Brig) works as scientific collaborator within FACILE project (cf. WP DE 1c).

DEVIMODE

(Development of modules using tools and methods prepared by the other subprojects with computer supported learning elements for the professional training of engineers and technicians with the integration of interactive distant learning in a virtual classroom)

General objectives of DEVIMODE

One of the objectives of the subproject DEVIMODE is to prepare the effective and efficient exploitation of the R&D project results in a real course program. The developed technological tools (CYBERTEACH) and the technological dissemination infrastructure for the defined hybrid methods and the protocols for learning and teaching (VIRTUAL CLASS) will be tested and evaluated with groups of users on different levels. The pilot courses will be run on postgraduate level for engineers (NDIT/FPIT) and on specific education level of other project partner institutions. This allows to investigate if and how tools and protocols can be generalized to different target groups and different education programs.

The second objective of DEVIMODE deals with the envisaged international aspects of the course-modules. Scientific contents don't stick to national frontiers. The growing globalization and the international scientific interdependence of research and development have effects on structure and future contents of education and training programs. It is thus very important to strengthen different forms of cooperation within the future professional formation and training system. Concerning the field of engineering science, this demand is crucial. From the scientific and economic point of view it is important to strive for national and international cooperation, because benefits for all institutions involved can be achieved this way.

The scientific objectives of DEVIMODE are

- to provide training modules for engineers at postgraduate level (postgraduate diploma, master diploma) and at the level of technicians for higher professional qualification.
- to introduce new learning methods, (computer assisted learning concepts, interactive distant learning concepts) in the practice of running education programs.
- to provide the actual technological state of the art within the postgraduate training of engineers and within the professional training for technicians, through the integration of specialized course elements and contributions of national and international partners.
- to define the module contents on a broad and interdisciplinary level. Complementary themes for engineers and technicians (economy, marketing, management, communication, project-work etc.)[3] will be taken into consideration as well.

The economical objectives of DEVIMODE are

- to establish a market-oriented approach. Evaluation results and economical demand of developed modules will have crucial impact on the elaborated offer.
- to achieve positive results concerning efficiency and effectivity of the modular-courses through a stringent quality control and through a dissemination to a larger public (geographically larger range).

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[3] vgl. Schlussfolgerungen Nationales Forschungsprogramm 33: Wirksamkeit der Ingenieurausbildung in der Schweiz, 1997.

The methodological and organizational objectives of DEVIMODE are

- to provide realistic test and evaluation environments for the two other subprojects CYBERTEACH and VIRTUAL CLASS.
- to attach importance to international connections by recruiting European partners as course producers
- to establish national and international connections with similar study programs.
- to assure the quality of the courses through an institutionalized professional evaluation and through permanent user feedback's and thus foster the development and improvement of the Beta-version products of CYBERTEACH and VIRTUAL CLASS.

Organizational structure of DEVIMODE

The following institutions will participate in DEVIMODE:
- HTA BE, Hochschule für Technik und Architektur, Bern (Project-manager of DEVIMODE: Dr. Andreas Ninck)
- NDIT / FPIT; Nachdiplomstudium für Informatik und Telekommunikation, Bern
- School of Engineering, Fribourg
- Zentrum für universitäre Fernstudien Schweiz, Euro Study Center Brig
- APEX conseiller d'entreprises, Vevey
- IBZ Brugg AG, State-recognized School for technical Engineers TS
- Studienzentrum Schweiz der AKAD-Hochschulen für Berufstätige, Zürich

European partners

Some European partners already started collaboration with Classroom 2000 consortium within the EU project FACILE (Grant-No 56534-CP-1-98-1AT-ODL-ODL) and other European projects:
- Donau-Universität Krems bei Wien (A)
- Technical University of Vienna
- Norges teknisk-naturvitenskaplige universitet (NTNU)
- Technical University of Kosice
- Universidad Politécnica de Valencia
- Porto University
- Human Capital Investment Oy (FI)
- Eindhoven University of Technology
- SEFI
- HB EUDILNET Hudiksvall (S)
- University of Florence (I)

or have shown their interest to participate
- Politechnico di Milano (I)
- University of Tübingen (D)
- Technische Universität Ilmenau (D)
- University of Namur (Be)
- Helsinki University of Technology (FIN)

This list is still open and not definite and can be changed and adapted.

Another important aspect of the envisaged European dimension is the participation of CLASSROOM 2000 consortium in several projects within 5th European Framework Program.

Work Packages of DEVIMODE (Deliverables):

WP DE 1:   Development of prototype modules

Within this work package, two independent projects will be carried out. They are described in details below:

a.)   Prepare CAL contents for an existing education program

- Established list of scientific, engineering or management contents in the postgraduate NDIT/FPIT education program and the IBZ professional education program which are well suited for a presentation in a virtual learning environment.
- Selection of modules with suitable contents from the NDIT/FPIT program (each equivalent to a learning effort of 2 - 4 ECTS credits) redesigned and upgraded with CAL elements.

Involved partners:
- HTA BE, Hochschule für Technik und Architektur, Bern (Project-manager of DEVIMODE: Dr. Andreas Ninck)
- NDIT / FPIT; Nachdiplomstudium für Informatik und Telekommunikation
- School of Engineering, Fribourg

Contact person: Dr. Andreas Ninck, HTA BE, Bern

b.)   Implementation of a CAL catalogue tool

- Deliver an easy to use catalogue for CAL teachware; the catalog will provide interactive access to relevant databases and ordering tools.

c.)   European Partners

- Setting up a network of contacts with international partners.
- Participate at European projects on new learning technologies.

Milestones

DEVIMODE	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP DE 1 (Development of engineering specified modules)																													
a.) NDIT / FPIT / EI Fribourg			1/6						2						3					4							5		
b.) MLT / Swisscom																													
c.) European Partners									11									12 14							13				

WP DE 1a:

5. Development of test module RT3
6. Development of test module RT2
7. Development of test module Systemic
8. Development of test module TQM
9. Development of test module Cryptology

⇒ Additional activity: Task 6 previewed within WP VC 1b:
10. Experimental set up of a virtual class

⇒ Additional activity: Successful co-operation between WP DE 1a and EMST (Ecole Multinationale Supérieure des Télécommunications) of Dakar/Senegal – running and evaluating common VC-courses.

WP DE 1b:

CLASSROOM 2000   -   Description

- MLT has closed its activities by end of 1997 due to management decision of Swisscom.
- Task has been partially taken into account within new work-package WP DE 3.

WP DE 1c:

Realized or planned international cooperation's are :

11. FACILE (FACILitated open distance learning Environment for continuing engineering education): project has started September 98
12. NLT in CEE (New Learning Technologies in Continuing Engineering Education): project proposal to be submitted at the 5th European Framework Program until June 99
13. VIP (Virtual Industrial Placement): project proposal to be submitted at the 5th European Framework Program until December 99
14. SEMUSDI: project proposal to be submitted at the 5th European Framework Program until June 99

WP DE 2:   Running of pilot-courses

1. Prepare the school infrastructure for the successful running of courses with CAL elements and / or within the virtual classroom.
2. At least one run for each upgraded module within the virtual class program of NDIT/FPIT.
3. Evaluation of modules about learning and teaching efficacy and efficiency.

Involved partners:
- HTA BE, Hochschule für Technik und Architektur, Bern
- NDIT / FPIT; Nachdiplomstudium für Informatik und Telekommunikation
- IBZ Brugg AG, State-recognized Schools for technical Engineers (see: „letter of intent": Annex)
- Euro Study Center Brig (only if an additional test environment is needed)

Contact person: Dr. Andreas Ninck, HTA BE, Bern

Milestones

DEVIMODE	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP DE 2 (Running of pilot-courses)																													
a.) NDIT / FPIT			7				8							7	9				8					10			7		
b.) IBZ (not determined yet)																													

7.   Running and evaluation of test module RT3
8.   Running and evaluation of test module RT2
9.   Running and evaluation of test module Systemic
10. Running and evaluation of test module TQM

- IBZ renounced its initially interest in running pilot-courses due to internal difficulties.

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WP DE 3:   Development of HEURIS information system

Because of the canceling of the work packages WP CT 3b, WP VC 2b, WP VC 2c and WP DE 1a, the definition of a further work package becomes necessary which unifies the tasks of these activities. The corresponding results will slip into an information system called HEURIS which is to be developed. In this way, HEURIS becomes an information system which is suitable for administration and presentation of current knowledge concerning new learning technologies.

Deliverables:
- Develop HEURIS information system software.
- Deliver an easy to use catalog for CAL teachware; the catalog will provide interactive access to relevant databases and ordering tools.
- Realize a CBT-information and selection tool and a specific user-oriented service
- Develop tools for an easy administrational handling of the CAL-environment
- Set up concept for student counseling service in VC (Organizational counseling, individual study planing counseling)

Involved partners:
- NDIT / FPIT
- HTA BE, Hochschule für Technik und Architektur, Bern
- Swiss Federal Institute of Technology, Lausanne
- University of Fribourg
- University of Berne

Contact person: Dr. Andreas Ninck, HTA BE, Bern

Milestones

DEVIMODE	97 11	12	98 01	02	03	04	05	06	07	08	09	10	11	12	99 01	02	03	04	05	06	07	08	09	10	11	12	00 01	02	03
WP DE 3 ***NEW*** (Information system on NLT)																													
NDIT / FPIT / HTA Bern / EPFL / Uni Fribourg / Uni Berne															15	16								17					

This work package is supported by the FACILE project and will be co-supported by KTI and the 5th EU Framework Program (cf. WP DE 1c) and contains a set of tasks originally previewed within WP CT 3b, WP VC 2b, WP VC 2c and WP DE 1b.

15. Develop HEURIS information system software.
16. Set up continuing courses in NLT for teachers.
17. Develop an easy to use catalog for CAL teachware.
18. Realize a CBT-information and selection tool – will be realized after CR2000 project end.
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19. Set up concept for student counseling service in VC – will be realized after CR2000 project end.

⇒ Additional activity: Successful co-operation between WP DE 3 and WP CT 3 (Set-up HEURIS prototype)