

(01) Ladies and Gentlemen

Thank you very much Mr. Karanka your gentle introduction and Mr. Simo Paavilainen for this invitation.

It's an honour and pleasure to be here having the possibility to speak about „Learning in Distances“ today.

(02) I have divided (*divaidid*) my presentation in two parts: first I will present the Swiss Federal Institut of Technology with our departement of archiecture and chair of structural design. This will happen in the most traditional way of „Learning in Distances“, this means having travelled from zurich to helsinki yesterday and speaking in front of you today.

The second part will introduce you to a different way of „Learning in distances“. The so said „mt_EAST manner“, which has no need to make you travel somewhere physically to be able to communicate. This system has been developed and is still in developement on an experimental base during the last few years in my course of mt-EAST.

The whole project is about „remote collaboration“ between students, tutors, experts, public authority of several Universities and different countries.

(03) And now to the first part:

(04) The ETH Zurich was founded in 1855 as Federal Polytechnical School.

On February 7, 1854 the federal councillors enacted the law on the “federal polytechnical school in association with a school for higher education in the exact, political and humanistic sciences”. In autumn 1855, the Polytechnic opened its doors.

Today the ETH achieved to be one of the top universities in Europe giving its networks more global moorings, improving its information technology and gradually transforming itself into a university of natural sciences and technology.

There are two more Polytechnical Schools in Switzerland besides the ETH Zurich: The Ecole Poytecnique federal de Lausanne and the Università della Svizzera italiana in Mendrisio/Lugano.

The ETH Zurich is build out of the following 15+1 departements:

AGRL	Agricultural and Food Sciences
ARCH	Architecture
BAUG	Civil, Environmental and Geomatic Engineering
BIOL	Biology
BSSE	Biosystems Science and Engineering
CHAB	Chemistry and Applied Biosciences
ERDW	Earth Sciences
GESS	Humanities, Social and Political Sciences
INFK	Computer Science
ITET	Information Technology and Electrical Engineering
MATH	Mathematics
MATL	Materials Science
MAVT	Mechanical and Process Engineering
MTEC	Management, Technology and Economics
PHYS	Physics
UWIS	Environmental Sciences

(05) Facts and Figures ETH:

Students 2007:	13999
Professorial posts 2007:	368
Total Expenditure 2007:	1'217'086'000 CHF (about 800 millions iuro)

(06) Starting from the seventies of the last century a new campus out of the very city centre has been built. In the last thirty years several new buildings have been risen, having been designed by more or less famous architects.

Let me give you a short overview of the most known personalities getting out of our department:

(07) Departement of physics 1972 > Prof. Albert Heinrich Steiner (1905 – 1996)

(08) Departement of chemistry 2006 > Prof. Mario Campi (1936 - ..)

(09) Departement of physics 2008 > Prof. Dietmar Eberle (1952 - ..)

(10) Sports centre 2009 > Austrian architects Dietrich/Untertrifaller of Bregenz

(11) The Departement of architecture is located in this brown building.

(12) Initially in 1970 it was thought to be home to the departement of civil engineering only. But then in 1976 also the departement of architecture has been located there.

(13) Facts and Figures DARCH:

Students 2007:	1520
Professorial posts 2007:	ca. 50
Total Expenditure 2007:	42'073'000 CHF (about 18 millions iuro)

And following well known professors are employed:

Professors (selection):

Caminada Gion	Chair of Architecture and Design
de Meuron Pierre	Chair of Architecture and Design
Diener Roger	Chair of Architecture and Design
Herzog Jaques	Chair of Architecture and Design
Kollhoff Hans	Chair of Architecture and Technology
Mateo Josep Lluís	Chair of Architecture and Design
Sik Miroslav	Chair of Architecture and Design
Schwartz Joseph	Chair of Building Structure Design

(14) Also well known is the civil engineer and chairholder of the chair of structural design Prof. Joseph Schwartz, which I am currently working for.

He and Prof. Christian Kerez formed a successful design team on several occasions having won many competitions.

I will tell you about one of them later on:

Joseph Schwartz started at ETHZ last year. He came to the ETH with an alternative teaching concept.

(15) It says: The designation Structural Design signifies the idea, defined as programmatic for the Chair of the same title, of the rapprochement between engineer and architect through the conflation of built structure and design concept.

A central element of this convergence is graphical statics, a vector-geometric illustration of the distribution of forces in a built structure which dates back to ETH Professor Carl Culmann (1821-1881).

The illustration of construction knowledge through a visual language that is understood by an architect and fosters intuition does not present an overly simplified view of interrelationships, but is mathematically precise and meets the standards of engineering sciences.

This method of structural analysis also fosters a holistic understanding of the interaction of form and structure, in other words the understanding of the internal forces within a built structure that help determine its form. (no bending-moment is explained)

Cable, Arch. Vault, Cable structure, Trusses, space trusses, beams, shear wall, pillars, etc.

(16) A similar aim about the rapprochement between engineer and architect was already existing in my elective course, called „Flächentragwerke“, which translated means „Surface Structure“ but covers more than that!

(17) Objective of the course is the recognizing and understanding of interrelationships between architecture, spatial (*spescial*) design and building structures and allowing these to impact ones own design. At the end of the lecture, students should have gained a set of instruments that allows them to design structural concepts, utilize the possible design of building structures and arrive at collective syntheses in their design work.

The course is also thought to be an interdisciplinary (fachgebietsübergreifend) one:

One third of may students beeing civil engineers completing their bachelor or master study. Thats why one of the aims of it, is to optimize the collaboration between architect, civil engineer and other building specialists.

(18) Now I would like to show you some examples, the so called „Reference-Buildings“ of my course-lecture:

The first one is the storehouse with an open store hall in Chiasso (in the italian part of Switzerland) of Robert Maillart, built in 1924-1925. The trusses of the open hall are designed according to a smart statical solution. At the same time an extrordinary architectural design and a very interesting spatial effect.

(19-24) And now some pictures...

(25) The second one is the MOMA in San Francisco designed by Mario Botta with Hellmuth, Obata & Kassbaum and Forell/Elsesser Engineers, built from 1992 to 1995.

What I like to explain to my students regarding this building is the confrontation of the appearance and the kind of bearing structure which lays behind the facade.

I also like to emphasize the design process of this building.

The first step of this process has been made in Lugano and the office of Mr Botta did not immediately consider the bearing structure. Only in a second step, not being anymore in Lugano, they defined (*defaïnd*) exactly reinforced concrete for the bearing structure.

More than that the office in Lugano had forgotten what a dangerous seismic area California is!

As a third step they started a collaboration with an architecture and an engineer office in the USA ... that's where everything changed.

(26 - 30) The following few pictures will show you the result of this design process.

(31) and then how the concept for the bearing structure changed ..

And the main question is, why the architect did not work with the civil engineer right from the beginning ?

(32) The third object I would like to show you, is a school in Zurich designed by Christian Kerez and Joseph Schwartz.

A building which will be completed soon. This project started with a competition in 2003. Right from the beginning architect and civil engineer have been working together.

Architectural design and structural design fusing with the bearing structure giving the solution for the architectural aim.

(333 - 35) The architectural concept has as aim to reduce the building surface on the ground to give more open spaces to the school. The concept of the bearing structure allowed to reduce this surface to the surface of the gymnasium. It has the bigger support free surface ca. 50 x 32 m

(36) And now to the second part of “learning in distances”:

(37) The presentation is organized in the following sub-sections:

- The Project
- The Topic (Comments to the images of the animation)
- Remote Collaboration / Remote Seminar
- Learning Goals
- Originality
- Relation to Professional Practice
- Use of Media Support
- Evaluation
- History
- Forms of Collaboration
- multi_Board

(38)

Johann Wolfgang von Goethe wrote: “In our judgment there is no greater and more effective medium to interactive education than collaboration”

(Introduction)

(39)

Do individual thought and action keep pace with the profound changes in knowledge, technology, economy and society?

What must we learn to keep up with the increasing complexity and dynamic of development?

Given the seemingly limitless development opportunities, what must we consider new or differently to enable further innovation?

Is it collective thought and cooperation, which will most likely promote the future common good in an age of growing interregionalism, or increasing multiculturalism?

Should we give credence to a learning concept which promotes a greater openness to additional cultures of knowledge and to a new way of thinking that enables us to see and understand our own knowledge and behavior in the context of overarching relationships and dependencies?

With true modesty I can say here and now that the didactic project mt-EAST has made strides in answering these questions.

Its contribution is very small, but the direction is, in my opinion, the correct one. In the next hour, I will attempt to show this direction and what, in detail is meant by and included in mt-EAST.

In hope that at the end of this presentation, you will be persuaded that such a remote collaboration belongs in your future as a student, tutor or professor.

(40) Project

With the help of new technology, it was shown that new forms of educational and learning activities are possible in a number of different areas. At mt_EAST (multilocal teamwork _ Educational Advanced Support Tools) interpersonal relationships stand at the forefront of the educational method.

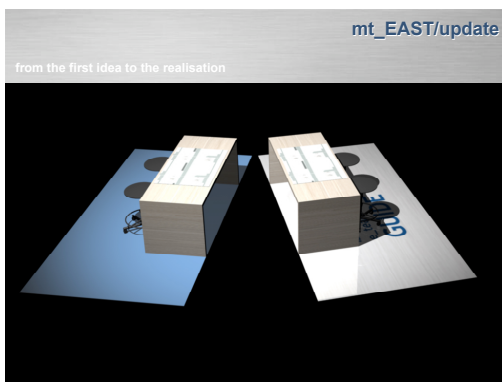
In order to ensure this human connection in the form of collaborative work, it is important that the technology used in this educational process act only as a means to an end and that it remain subordinate to the actual academic subject.

The basic requirement in achieving this goal is a simple but efficient technical configuration of hard and software. Remote collaboration serves as a focal point for students of different technical institutes and docents of different disciplines.

In the last part of their studies, students have an able grasp on the theoretical knowledge necessary for professional practice. However, as a rule, students have little or no experience in the professional context of planning teams and are only rarely familiar with modern forms of communication. mt_EAST represents an innovation in location-independent and problem-oriented group work, which draws on real situations of actual professional practice.

mt_EAST is made up of group work, collaborative work, team dynamics, reciprocal consultation, a transfer of knowledge and trans-disciplinary education, targeted contribution of docents and tutors in small groups, individual supervision of single students and small groups, and involvement in seminar and workshop-like activities.

(41) Still often today and up until a few years ago, collaboration traditionally occurred on a table on which the articles discussed were exclusively in paper format. In the realm of architecture, these documents were supplemented by drawn plans, models and construction drawings. The prerequisite for such collaborative discussions was the presence of all concerned persons at the same place.



(42) Despite the rapid advancement of phone and fax communications, dialogue conducted in two different- meaning separate- places was difficult.

- (43)** Very different is the location independent collaboration, where the articles discussed are no longer in paper format, but in digital form on a laptop with communication equipment such as a webcam and headset where participants are connected via the internet. Software developed specially for such online-meeting and installed on both participant computers can lead to a promising remote collaboration.



(44)

On these two tables we see:

A personal computer (desktop or laptop) with the possible operating systems of Mac OS, Windows, or Linux.

A headset with microphone or additionally a microphone with echo-suppression, such as PC-speakers.

Last but not least a webcam. The webcams integrated in PCs are only of limited use for meetings with multiple people as they are designed for ,one-on-one' communication. One can see the user interface of the communication-software on the screen:

In the large window, to the right, is the so-called whiteboard, on which images and drawings can be loaded. On this screen, participants from each workstation can sketch simultaneously.

On the left side of the screen, one can see what each webcam is currently recording. The tools are supplemented by a chat-window to ensure continued communication in the event of audio-problems. The software also enables the sharing of other programs (for instance CAAD-Software).



- (45)** An effective aid for sketching on a whiteboard can be achieved through the use of a graphic-tablet, which can be seen on the left side of the table. Drawing directly on the screen with the provided pen allows for an effective and realistic simulation of sketching on paper.



(46)

Additionally, the graphic-tablet presents a second screen enabling two or more people to take part in the remote collaboration without problems. In this case, the headset should be replaced by a microphone and (PC)-Speakers.



(47)

To optimize the remote collaboration, the project mt-EAST has developed an electronic table, which can be used for remote collaboration meetings of 4 to 6 participants as well as so-called remote seminars of up to 8 participants.



(48)

The table is equipped with a touch screen monitor at the center, with built-in speakers and adjustable height and inclination.



(49)

For a remote seminar of more than 8 participants (per location) or one in which additional ,spectators' are present, a projector is recommended.

(50) REMOTE COLLABORATION. What means this word?

In general, a „remote collaboration“ is cooperative work over distance.

The collaboration is enabled by technical means, but the person remains as the focal point.

Usually, a didactic scenario is selected and organized according to hierarchy (*hairachy*), activity, as well as the available time and involved persons.

Within such a scenario, two fundamental forms of meeting are possible: remote collaboration and remote seminar. In their function, both forms of communication fulfill many learning goals in the areas of subject, social, and media competence.

(51) Remote Collaboration (RC) stands for collaboration in small teams. Two to three students of each participating technical institute make up a team and work on a common assignment. This form is particularly well-suited for continued collaboration with weekly meetings. The length of a meeting should not exceed 45-60 minutes, which represents a work efficient time frame and avoids the danger of fatigue (*fatig*).

The number of participants must be limited (max. a total of four persons) as experience has shown that more than four partners increase the likelihood of free-riding behavior. Additionally, the larger the group, the greater the demand for professional moderation to assist the team in its work and to maintain productivity and efficiency.

In smaller groups, on the other hand, it is possible for a practiced assistant to fulfill the function of a moderator relying solely (*solly*) on his or her experience and intuition. Nevertheless, the three basic elements of group work must be kept in consideration: the assignment, the team, and the individual.

These aspects must be coordinated and governed in order to maintain the productivity of the group. However, the assistant must stay out of subject-specific discussion and maintain a neutral position both toward the subject matter, as well as the participants.

Through experience, team dynamics have proven to be so important that a clear hierarchy (*hairarchy*) and a division of roles are pivotal (*pivotal*) for the success of the meeting, precisely because of the limitations of communication.

The personal distance between team partners enables students to present professional and constructive criticism, as well as to develop a subject-specific language.

The guidance (*guidance*) of a fellow student furthers knowledge of the subject: students teach students.

Constant feedback regarding atmosphere, motivation, and satisfaction is sought to continually improve the remote collaboration.

(52) Remote Seminar (RS), on the other hand, is used to denote a new type of educational forum in which multiple students are able to receive the support of a docent through the help of an electronic table.

This form is particularly suited for intensive, onetime collaboration. Either new material is presented by a docent and offered up for discussion, in which students take part as equals, or the seminar is run as a discussion between students.

The length of the forum is strongly dependant on the number of participants and type of organization, but should not exceed 90 minutes.

Due to the high number of participants and the associated risks, a minimum of one docent acts as a professional moderator. With his know-how and in consideration of the three areas (the assignment, the team, and the individual) the docent is responsible for the correct

implementation, coordination, and guidance of important factors in the success of the seminar.

For example:

- Presentation of the Process; in which participants are invited to actively take part in the discussion and to act as moderators themselves.
- Result Oriented Planning; in which the collaboration/discussion is planned according to the desired result, rather than the actual problem. This enables a goal-oriented process.
- Structuring of the Problem Solving Process: in which the seminar is divided into different problem solving phases, for instance: brainstorming, consolidation, and assessment.
- The Establishment of Rules for the Collaboration: for example, that everyone is entitled to his or her say, that different opinions are respected.

It is interesting that in this type of groupwork, the new didactic method really begins to play a role and defines a new hierarchy. The docent steps out of the classical position as teacher in a classroom-like setting and moves into the role of a moderator, promoting the cooperative work and learning of the students.

Naturally, constant feedback regarding atmosphere, motivation, and satisfaction also seeks to continually improve the remote seminar.

LEARNING GOALS

(53) The most important learning goals are subject, social, and media competence.

(54) a) Improvement of Subject Competence:

Through remote collaborations, students can exchange and gain knowledge from colleagues, assistants, and docents of partner technical institutes. Students learn a subject-appropriate and aesthetically convincing form of representing primary elements, as well as the application of theoretical knowledge in the process of a planning assignment.

(55) b) Improvement of Social Competence:

Through remote collaboration, students learn to fulfill their own role within a team, think self-critically, and to defend their own position. In an extended meeting panel, students present, discuss, and substantiate their own team contributions. Students further learn to evaluate the suggestions of third persons, to combine these with their own ideas, and to search for a common solution.

Students learn to formulate pertinent critiques on the work of others and thereby offer a constructive contribution to this type of activity.

(56) c) Improvement of Media Competence:

Students gather experience working with the software of remote collaboration, in particular tools such as Whiteboard, Marmitech, Program-sharing, and Webcam operation. Students learn to implement technical tools such as graphic tables,

Webcams, and eTables, as well as the fundamental techniques and actions of remote collaboration such as the transmittal of information, and the immediate transmission of comments or possible solutions in the form of speech, live-sketches, and electronic documents.

ORIGINALITY OF THE PROJECT

(57) While computer-assisted collaboration of multiple student groups is a desired and sought-after learning method, its implementation often occurs in a spontaneous and informal manner with few appropriate resources.

The present project, however, presents a clearly defined form, precisely defined didactic principles and a closely supervised and monitored (*monitid*) learning environment. In this respect, the project also presents a singular event on an international level. Research is routinely carried out in order to gather and compare new discoveries and thereby further develop the project.

RELATION TO PROFESSIONAL PRACTICE_

(58) In order to offer students important tools along their journey into professional practice, the idea of simulating a typical day in the working practice was developed.

(59) Every time I speak about mt_EAST, I like to sketch out the following scenario:

A project team, composed of professional specialists and architects, who do not share a common workspace, work online to solve a common problem in realtime through remote collaboration. In a professional context, the typical day requires competence in exactly the same areas. The simulation of a real life design scenario counters shortcomings: it offers the subjectrelevant, didactic, and technical foundations upon which students of different technical institutes may build. Further, thanks to its new communication technology, participation in a „remote seminar“ will offer an introduction to a type of seminar or commission-like setting oriented towards future developments. One could also imagine using the project in „individual test areas“ of professional practice between an architecture and an engineering firm.

(60) USE OF MEDIA SUPPORT

(61) Electronic media plays a decisive (*disaisiv*) role in the project: its influence ranges from the chosen methods of communication/transmittal to the support of remote collaboration.

The project should be completed with the same level of technological support found in a mid-sized planning office.

The software should possess a high level of user-friendliness, easy operation, low costs, and as wide as possible a range of applicability. The program should function very efficiently and reliably (*rilaiibli*) in order to allow the user to focus fully on the group work and communication, for which the technology should serve as an invisible support mechanism.

Such kinds of software are continually improved, new software is tested frequently.

EVALUATION

(62) Evaluations are carried out in order to collect continual feedback from students and improve the academic setting. The remote collaboration and its didactic aspects are the focal point of the evaluation. Particular attention is paid to the development of the subject-specific, social, and media competence of students; the support of assistants and docents; and the treatment of the subject matter.

Further topics include the different roles assumed by students, the approach to the communal assignment, as well as the technical side of the collaboration, and the aspects of self-regulated, self-directed, and problem-oriented learning.

The project leader thereby gains an instrument to control the progression of the project and can, on demand, make guiding interventions and/or implement appropriate measures.

DEVELOPMENT HISTORY

(63) To show you all the spectrum of our experiences in Zurich, a short history of the project:

(64) The first attempt at this inter-school cooperation occurred during the summer semester of 2001 in collaboration with the Accademia di Mendrisio. The design topic, a conference center, dealt with an object of a certain size and complexity in which the load bearing structure played an important role.

In a continuation of the project, students of the TU Braunschweig and Berlin assumed the roles of project managers in the summer semester 2002

(65) The design topic in Braunschweig was a primary school and

(66) in Berlin a multimedial center) and presented their own design as a subject for the teamwork. The students of the ETHZ assumed the role of specialized architects (construction, load bearing structure, etc.) and contributed as advisors and specialists.

(67) In the winter design semester of 2002/03, the design topic was a VIP-terminal with hanger in the airport of Frankfurt a. M. Teams were composed of three students from three different technical institutes (Braunschweig, Aachen, and Zürich), who operated purely as design architects.

In the second half of the semester, the assignments and responsibilities were divided in such a way as to allow each student to continue the group design individually. The teams thereby altered their compositions: one student assumed the role of project leader, continuing his or her individual design with the advice of the two remaining students who took on the roles of specialized architects. This strategy mirrored the different strong points of the three technical institutes: design instruction in Braunschweig, CAAD in Aachen, and construction knowledge in Zürich.

The possible composition of teams (distribution of roles), as well as the cooperation of three people in an existing group (mode of work), was tested in the first, four-semester phase of mt_EAST (multilocal teamwork _ Educational Advanced Support Tools). After a pause for reorganization and restructuring of the program, the remote collaboration was reinstated in the winter semester 2004/05 with substantial didactic and technical improvements.

(68) Renewing the collaboration with the TU Braunschweig, a boxing center in Braunschweig was presented as the semester design topic. The process of design was conducted via remote collaboration in three person teams with a specific division of roles: „Chief Architect“ in Braunschweig under the advice and supervision of two „Specialized Architects“ in Zürich.

(69) The summer semester 2005 was also conducted with the TU Braunschweig. The semester topic was a Jam House, a building for music and the culture of jazz, on a building parcel in Braunschweig. With the introduction of ‘eTables’, this semester involved the first remote seminar.

(70) In the winter semester 2005/06, the design topic was entitled “Skate Lab in Braunschweig.” The object of the semester was to utilize common skate elements in order to create new spaces, which could be used by skaters as practice surfaces and simultaneously house school rooms, accommodation, etc.

(71) In connection with this semester, a new application of mt_EAST was undertaken. On 14.11.2005, the “Day of Teaching,” a daylong remote workshop, was carried out as part of the 150 Years ETH celebrations. The assignment, based on the current semester topic, was a skater track on the ETH Höggerberg. Without a predetermined distribution of roles, the students had to work in a large group, as well as form smaller groups according to the division of work, which reflects the actual planning process in professional practice (see provided scenario, example 2). The division of roles occurred according to the strengths of each technical institute; the students from Braunschweig knew more about the topic, those from Zürich more about the location.

(72) In the summer semester 2006, the task was to convert the ruins of St. Nikolai in Zerbs (Sachsen-Anhalt) into a new cultural center. The group work was carried out in the same manner as the previous semester.

(73) In the winter semester 06/07, the design topic of the students of the TU Braunschweig involved the design and planning of a ballroom.

(74) For the first time, building engineering students took part in the collaboration. The chief-architect was located in Braunschweig, while in Zürich a specialized architect and a building engineer offered advice on technical and construction issues. The remote collaboration thus strove to achieve a realistic simulation of professional practice, a scenario described earlier.

(75) Teams with architecture and building engineering students could also be formed in subsequent semesters and successfully integrated into the remote collaboration. Further collaborations with the TU Braunschweig (design topics being a day nursery, a brewery and a highway church) and new collaborations with the Technical University of Delft (Holland) and Carleton University in Canada followed. I will come back to these experiences later.

(76) Particularly important was the collaboration with your school in the spring of 2008.

Juhani Karanka answered with enthusiasm to my inquiry into a possible collaboration with the project mt-EAST and suggested a ‘real’ assignment in Würzburg (Germany).

His suggestion presented a new, very interesting scenario:

For the first time in the history of mt-EAST, an official institution (the city building authorities of Würzburg) was involved, for the first time two, truly interdisciplinary teams were assembled (architecture, landscape architecture, and traffic engineering students from the TKK and architecture, building engineering and environmental engineering students from the ETHZ) and for the first time, the results of the collaboration were presented to the public of Würzburg in an exhibition and a presentation to the building authorities of Würzburg.

(77) The assignment was the development of a master plan for the area around the Würzburg train station (for which the team in Helsinki was responsible) with some focal points in architecture and building structure, so-called hotspots.

(78-79) These focal points consisted of two railway overpasses, a multi-use hall, a high-rise next to the train station and the design of a garden area in front of the train station.

(80) The success of this collaboration led to a second semester, such that today, two new teams from the TKK and the ETHZ are involved with the Zellerau district of Würzburg.

Last year and in this term the City of Würzburg provided the collaborating universities with information and access to a real urban planning site and situation in Würzburg, that is of academic interest and practical challenge for the students of TKK and ETH.

This last phase of the project, particularly given the regular and thorough evaluations which were carried out, affirms the timeliness and validity of cooperative work via remote communication and the consolidation of the three types of remote communication - remote collaboration, remote seminar, and remote workshop.

Forms of Collaboration:

(81) I make now a list of forms of collaboration, to resume your possible experiences in the future:

(82) SEMESTER REMOTE COLLABORATION

A scenario: a mid-sized architectural office receives a special contract (for an airport hanger, for instance). In order to meet all the technical and construction requirements, the office selects partners within Europe with the needed know-how. The design work of the team takes place through remote collaboration in order to avoid unnecessary travel from place to place.

The collaboration occurs over an entire semester, in regular intervals, between a maximum of four students (1-2 students per university).

In this context, it is important that one team takes on the role of design while the other acts as consultants or experts (for instance of building technology).

The clear division of roles and personal distance to one's team partners enables students to offer professional and constructive critiques and to develop a vocabulary appropriate to the subject matter.

The consultation between students furthers the knowledge of the subject on both sides; students teach students. Assistants and tutors/professors supervise the meetings, moderate the proceedings, and offer input in subject-related questions.

(83) ONE DAY WORKSHOP

In this scenario, a case drawn from professional practice is simulated. In the evening, a builder calls a mid-sized architectural office and requests a feasible (*fisibol*) design idea for the following day. The architectural office calls in a second office, which, for instance, knows more about the design topic

(I have already explained the topic of a one day collaboration for the 150 year ETHZ-anniversary, dealing with skater facilities).

The design assignment, which is to be solved in a single day, is presented at the beginning of the workshop. Work is divided into phases and approached through RC, RS, and divided into teams (4-5 members per team).

This alternation between the entire group, the teams within a location, and individual students is based on professional practice.

The combination of RS and RC enables the approach of a complex assignment over distance.

The working method has proven itself to be very effective, and the type of assignment calls for fast reactions from both parties.

The distance reduces inhibitions and promotes a serious working environment.

The two teams work as equals and are different only in the content of their specialty; thereby the two student groups complement each other. In the remote seminars, one team member should always be responsible for presenting the results of previous work.

(84) DIPLOM REMOTE COLLABORATION

The collaboration between building engineer and architect is an important aspect for good design. Remote collaboration enables such consultation between architect and building engineer, even when they are not located in the same place. As the basis for their own diploma projects, diploma engineer students usually use the diploma projects of architecture students who are often no longer located in the school or even in the country.

The building engineer calculates the static requirements of the project. Through remote collaboration, the diploma student can discuss his or her suggestions with the author of the project two to three times, in order to ensure that the static solution suits the original architectural concept. In mt_EAST, projects from the semester-remote collaboration were used.

(85) WEEK WORKSHOP

Together with a team of experts, who work in a remote location, the architect elaborates his initial project. Via remote collaboration the progress of the work is discussed multiple times a day, so that the development of a solution can take place in alternate work phases involving the entire team.

(86) The collaboration between the TU Delft and the ETHZ takes place through an intensive workshop of one week. Together, the students further develop and detail the projects of the master students of the TU Delft in a larger scale. Each group consists of three students (one from Delft and two from Zürich). One to two supervised Rcs are offered per day. Otherwise, the students arrange their group work personally. The Rcs are relatively short, so targeted questions must be answered and decisions reached efficiently.

A kick-off meeting in which students meet to define the goals of the assignment can greatly improve results.

The following form of remote collaboration or remote teaching is a special function of the remote collaboration infrastructure and software:

REMOTE COLLOQUIUM

A remote colloquium took place on 4.07.2008, in collaboration with the Institute for Building Materials. Via a virtual space, enabled by Marratech software, students were offered the opportunity to follow the colloquium from home and were able to ask questions or make comments. The students on site (approx. 30) pursued the assignment live. In place of a blackboard, the Whiteboard of Marratech, was projected onto a screen by a beamer. In total, nine students took part in the colloquium remotely.

In general, very positive feedback was received.

Not only were the online participants able to profit from the colloquium, but they had the advantage of being able to write actively on the Whiteboard, for all to see.

The presentation with graphic-tablet, Whiteboard, and webcam worked well and was easily comprehensible. There were no major technical problems. A test-run was carried out by mt-EAST in advance, to minimize any questions regarding technology during the colloquium.

REMOTE COMPETITION

(87) During one semester two teams of different expertise (one from ETHZ and one from the Carleton University in Ottawa) worked on an assignment, similar to the participation in a competition.

The goal of the collaboration was the presentation of a collaborative design for the conversion of a duty free warehouse in Zurich. Work occurred in a Ping-Pong format, in which a team worked on the project during one week, then passing it over to the other team during the remote seminar. During these seminars, teams were able to discuss suggestions and pose questions. Depending on the situation, deviations from this strict structure occurred in which suggestions were developed synchronously or asynchronously.

Despite the large distance and a time difference of six hours, both teams were able to attain timely results.

At the end of the collaboration, the results were presented in a final remote session with guest critics.

For the first time, the DCV (Deep Computing Visualization) was utilized which allowed both teams to manipulate a 3D model during the remote collaboration.

The parity of the teams, the set deadline and the clearly delineated goals resulted in productive teamwork and a well structured meeting format.

(88) This collaboration took place during the last semester (Fall 2008).

All the participants, the dean and Professor Stephen Fai (Associate Director of the Graduate Program) of the School of Architecture at Carleton University in Ottawa and I have, to this day, never physically met! All preparation and organizational work, the three months collaboration and the final presentation took place via remote collaboration meetings!

(89)

A short movie will show you now how a such remote seminar works. They are three sequences (*siquensis*): the first one was recorded at the beginning of the collaboration, the second one three weeks to the end, and the third one is the project presentation with guest critics.

(90)

Last but not least I would like to present to you our new instrument for the remote collaboration and remote seminar: the multi_BOARD

The project mt-EAST has continually sought (*sath*) to optimize the user interface and to test and evaluate new software and hardware.

In 2005, an electronic table, the InteractTable, from the company Wilkhahn, was tested for the first time. Many positive experiences were made, particularly in remote collaborations with multiple participants.

In 2006, an eTable was developed, a flat-screen, on which one can sketch by hand or with a pen. The eTable had a fixed height, was immovable, and, due to its horizontal position, only suitable for a limited number of participants.

For this reason, a new ergonomic table was developed by my team and I in 2008.

Its name is multi_BOARD.

It is based on an electronic drawing board, rather than on a table.

The multi-BOARD is an interactive drawing board, developed especially for conducting remote collaborations and particularly remote seminars and fulfills the essential requirements of a multifunctional tool.

The multi-BOARD has wheels for transport, built-in speakers, and can be quickly connected to a laptop. The height and angle of the table's screen can be adjusted via a hydraulic pump.

It is also possible to save specific working positions and recall these via the press of a button.

(91 - 93) Hier some pictures...

The most usual configurations are:

Configuration 1: Conference Table

Horizontal. One person or a small group.

Discussions in smaller frameworks or between members of the same standing.

The height of the table is appropriate for work while standing or sitting on bar stools.

Configuration 2: Drawing Table

Tilted at 30 degrees- 50 degrees. One person or smaller teams.

The tilted position of the table facilitates work considerably. Yet the number of participants is limited, as one can work on only one side of the table.

Configuration 3: Blackboard

Tilted at 90 degrees. Appropriate for large groups with hierarchical structure, seminars, presentations, and critiques.

In this position, the multi-BOARD can also be used like a blackboard.



(94) Conclusion

In the past years, mt_EAST has done much experimentation and there still remains much to be tested in regards to remote collaboration.

The project has been met with much enthusiasm, yet it has also inspired much criticism. Both have acted as driving forces, striving to show professional and didactic spheres that location-independent collaboration belongs to the future of higher education and professional practice.

All these experiences are in this publication (*I will take the booklet in hand*)

It provides a step-by-step documentation of the development, current form and potential of this new didactic tool.

Today I strive to pass on the torch of this imaginary relay to you, dear public, in the hope that this message is passed on to you.

My hope is: trust and try for yourself this new didactical method.

If you need a partner, I am happy to offer advice and support.

I will employ the proven types of remote collaboration and test new forms of cooperation, giving my students the unique opportunity to work with foreign colleagues, gain insight into other methods of education and to enrich their own education through the contact with foreign cultures.

(95)

I so hope to prove that the following addendum to the quote by Johann Wolfgang von Goethe, found on the first page, is more than appropriate to our time and professional practice:

“In our judgment, *today and in the future*, there exists no greater and more effective medium to interactive education than *electronic collaboration*”

Gianni Birindelli

(96)

we saw at the beginning this picture of F.L.Wright with his staff members.

I am sure, after my lecture, he would work in this new way ...

(97)

(98) Thank you!

some questions?