ZIFF PAPIERE 126

VIRTUAL CLASSROOMS IN EDUCATIONAL PROVISION: SYNCHRONOUS ELEARNING SYSTEMS FOR EUROPEAN INSTITUTIONS

by

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which we strongly recommend !

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Introduction

This book has two purposes: to provide information on synchronous elearning systems for European education and training providers and to provide a Manual of Good Practice for European trainers and training organisations.

Synchronous elearning systems are also known as Live elearning or as Virtual Classroom systems. Although widely used in the United States of America these systems are little known and little used in Europe.

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Desmond Keegan
Dublin, July 2005

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Synchronous elearning systems: an introduction

Desmond Keegan

The distance education background

It can come as a surprise to European experts in Open Universities and distance education to learn that the term 'distance learning' as used in the United States of America in the 1980s and 1990s can refer to both group-based distance learning and individual-based distance learning. They tend to think that all distance education was structured as the individual-based systems to which they are more accustomed.

Distance education in the 1980s and 1990s in Europe was organised by open universities and correspondence schools with the student being taught as an individual usually at home or at work. In many ways this was one of the great strengths of distance education as it freed learners from the need to go to a university or training centre in order to learn. In this way distance education anticipated many of the values of lifelong learning that are so appreciated today:

- Training when it is needed
- Training at any time
- Training at any place
- Learner-centered content
- Avoidance of re-entry to work problems by provision of bridging courses
- Training for taxpayers, and those fully occupied during university lectures and sessions at training centres.

Eventually it became possible to offer university degrees, college diplomas and training certification for studies undertaken at a distance.

In America there was no open university but distance education programmes were offered from correspondence schools and correspondence departments of many American conventional universities. But this is only half of what Americans

understood by ‘distance learning’. The other half was group-based distance education.

In America a common form of ‘distance learning’ was group-based systems via satellite. A common structure for provision was for a professor to deliver a lecture at the conventional university with a video camera in the lecture theatre. The feed from the video camera was uplinked to a satellite and then downlinked to a series of groupings of students brought together at other sites throughout the state. Feedback from the students at the remote sites to the professor was usually provided by a telephone link.

In a similar way group-based distance education was organised in America via videoconferencing. Students enrolled at, say, the University of Albuquerque in New Mexico in, say, a Masters Degree in Nursing could avoid the 300 km journey to the university and back after a day’s work in the hospital by gathering in a group in front of a videoconference machine at the hospital and receiving their lecture there. This proved a satisfactory method of study as the two-way audio, two-way video link of the videoconference system provided full interactivity, even though the link was frequently a fragile 112 kb per second.

Distance education for groups by satellite and by videoconferencing did not prove popular in Europe and was little used.

The elearning scene today

It can come as a surprise to European experts in elearning today to learn that the term ‘elearning’ as used in the United States of America today can refer to both group-based elearning systems and individual-based elearning systems. They tend to think that elearning refers to the individual-based systems to which they are more accustomed.

‘Traditional’ e-learning courses are usually organised for students studying on their own, at home or in their office, using Learning Management Systems (LMSs) or Virtual Learning Environments (VLEs) like Web CT or Blackboard. The study is usually individual, with or without contact with a course tutor for feedback and assessment. University degrees, college diplomas and training certification can be awarded for study in this way.

In the United States of America the term ‘elearning’ is also used for a different form of elearning that is group-based. In these group-based elearning systems a lecturer or trainer is linked electronically with a virtual class of many students located in any part of the world. The class comes together, with the teacher, at a fixed time on a fixed day for a fixed duration and the trainer delivers the class live to the students wherever they are. Many electronic means are made available for the teacher to communicate with the students and the students to communicate with each other.

These electronic groupings of students for elearning are little known and little used in Europe. Their importance in America is underlined by the fact that many of the market leaders in 'traditional' elearning are having to provide a synchronous elearning system, side-by-side with their asynchronous one, to meet the market demand.

Terminology

Considerable confusion exists in the terminology used to describe these group-based elearning systems. Three terminologies are used to refer to these systems by the various providers: 'synchronous elearning systems' or 'live elearning' or 'virtual classrooms'.

The term 'virtual classrooms' has strengths in that it emphasises that a grouping of students is set up for the learning experience in a class as in ILT (instructor led training) but not as in 'traditional' elearning where students study mainly individually. It also uses the word 'virtual' to show that the class do not meet face-to-face but are brought together electronically or virtually and can be in any part of the world. The weakness of the term is that people use the term 'virtual classroom' for a wide variety of educational structures not limited to the synchronous elearning systems under discussion.

The term 'live elearning' has strengths in that it emphasises that it is a form of elearning that is live. The use of the term 'live' shows that the class comes together at a certain time and for a certain duration and that they hear the trainer's voice 'live' and can communicate 'live' with the other students in the class. The weakness of the term is its vagueness and the lack of clarity as to what 'live elearning' refers.

The term 'synchronous elearning systems' has strengths in that it emphasises that one is dealing with a form of elearning and that this is a synchronous form of elearning. The term 'synchronous' differentiates this form of elearning from more traditional forms which are clearly asynchronous and gives the idea that one is dealing with a live event going on synchronously at a number of locations. The weakness of the term is its use of the cumbersome word 'sychronous', a term that is little used outside education circles.

Synchronous means happening, existing, or arising at precisely the same time or recurring or operating at exactly the same periods or having the same period and phase. In digital communication it refers to a transmission technique that requires a common clock signal (a timing reference) between the communicating devices in order to coordinate their transmissions. It means occurring at the same time or at the same rate or with a regular or predictable time relationship or sequence.

Asynchronous means not happening, existing, or arising at precisely the same time. In computing it refers to not synchronised by a shared signal such as

clock or semaphore, proceeding independently. It is a process in a multitasking system whose execution can proceed independently, in the background. Other processes may be started before the asynchronous process has finished.

Differences between synchronous elearning and ILT, videoconferencing and traditional elearning

It is important to be able to differentiate synchronous elearning systems from other forms of educational and training provision with which they are often confused.

Instructor Led Training (face to face education)

ILT means Instructor Led Training or face-to-face education and training provision in a lecture theatre, classroom or training centre. Examples of synchronous education and training provision are found in the classroom and the virtual classroom. In both scenarios, the participants and leader have a common time element. In the case of the physical classroom, participants and leader also have a common location.

The benefits of using synchronous elearning provision include (i) the familiarity of the classroom model, (ii) learners receive immediate feedback from other learners and the leader (iii) the ability to create content quickly in the classroom. A synchronous environment provides particular value for those who learn best by working with others, listening, viewing and questioning. This environment is also helpful for those who have difficulty in organising their time. Additionally, most learners are comfortable and familiar with the classroom environment.

The differences between synchronous elearning and ILT are that the class is brought together electronically and not physically, and forms a virtual classroom. The students sit at computers anywhere in the world on which the synchronous classroom software is displayed and follow the course delivered by the teacher from a remote location. Thus many of the benefits of a conventional classroom are recreated electronically.

Videoconferencing

Videoconferencing provides a two-way audio, two way video link between one or more persons at one or more remote sites. In an educational setting all the students can see and hear the teacher and all the students at the remote site(s), and can be seen by and heard by the teacher and all the students at the remote site(s). A student coughing at one site can distract the students or teacher at the other site(s). The interactivity of the face-to-face classroom is electronically restored.

From the point of view of education and training there are two major forms of videoconferencing: ISDN-based videoconferencing, and computer-based systems like Microsoft's NetMeeting.

ISDN stands for Integrated Services Digital Network. ISDN is a high-quality, switched digital communications service that gives your standard phone line the ability to transmit voice and data simultaneously. You can use the same line for regular telephone service, faxing, computer communication, or even live videoconferences.

For educational use of videoconferencing the recommended transmission standard was 6 ISDN lines X 64 kbit per second, giving a total of 364 kbit per second. This enabled the codecs in the videoconferencing systems to hold the movements of the teacher steady and allowed for a satisfactory educational atmosphere. But in the United States of America educational videoconferencing was carried on at 112 kbit per second or 2 X 56 kbit lines. Videoconferencing provides an excellent context for education and training but its popularity has waned in recent years. This is due to two causes: the impact of e-learning on all forms of distance education and cost. E-learning has become a worldwide phenomenon and has reduced the use of most forms of distance education, including videoconferencing. Cost remains an issue for most institutions who hesitate to pay for 6 (or even 2) ISDN lines for many hours for a training session.

Synchronous elearning systems are easy to differentiate from ISDN videoconferencing in that they are internet-based technologies whereas videoconferencing was largely telephone-based. In synchronous elearning systems the students can hear and talk to the teacher but they see the teacher's presentation, usually Powerpoint slides on their browser. The facility of videoconferencing to see the teacher and the movements and reactions of the students at the remote site (if the teacher is not alone at the remote site) is not available.

Systems like NetMeeting are less satisfactory for teaching groups of students at a distance. As its name implies it was designed for meetings and not for education. When using NetMeeting for education or training file transfer could be interrupted because of the bursty nature of the communication medium. To avoid this an institution could reserve a part of its network for videoconferencing classes but then the reserved part of the network would not be available to other users. In addition, it is difficult to get groupings of students to sit in front of a computer and follow the NetMeeting session, and thus one of the great attractions of videoconferencing – the ability to recreate a class at one or more remote locations is lost.

Synchronous elearning systems are less easy to differentiate from NetMeeting-type videoconferencing as both are internet-based technologies. In the synchronous elearning systems the system is designed for education and training and students can hear and talk to the teacher and see the teacher's presentation on specially designed web

browser software whereas the NetMeeting browser design is less directed at education.

'Traditional' elearning

Much of the current confusion about the identity of synchronous elearning systems comes from a failure to distinguish them clearly from asynchronous elearning systems or 'traditional elearning'. The main difference is that the application running on the students' browsers in synchronous systems allows a synchronous event to run, whereas in an asynchronous elearning situation the application allows an asynchronous event to run.

In essence both synchronous and asynchronous elearning systems are client-server systems, using IP technology, to access services located on the internet, which are accessed by a web browser. It is what is downloaded by the browser that identifies whether it is a synchronous or an asynchronous form of elearning that takes place.

Difficulties can occur because most providers of synchronous elearning are corporate providers whose systems are firewalled. This means that the teacher or trainer is within the firewall and the students are scattered throughout the world. The usual solution is to co-locate the server so that customers outside the firewall can get access to the server as it has a public IP address and thus the system can receive customers from outside the firewall.

Major providers of synchronous elearning systems today

From the many providers of synchronous elearning systems today, six have been chosen as examples. These are Centra, Horizon Wimba, SumTotal, LearnLinc, Elluminate and Interwise.

Centra

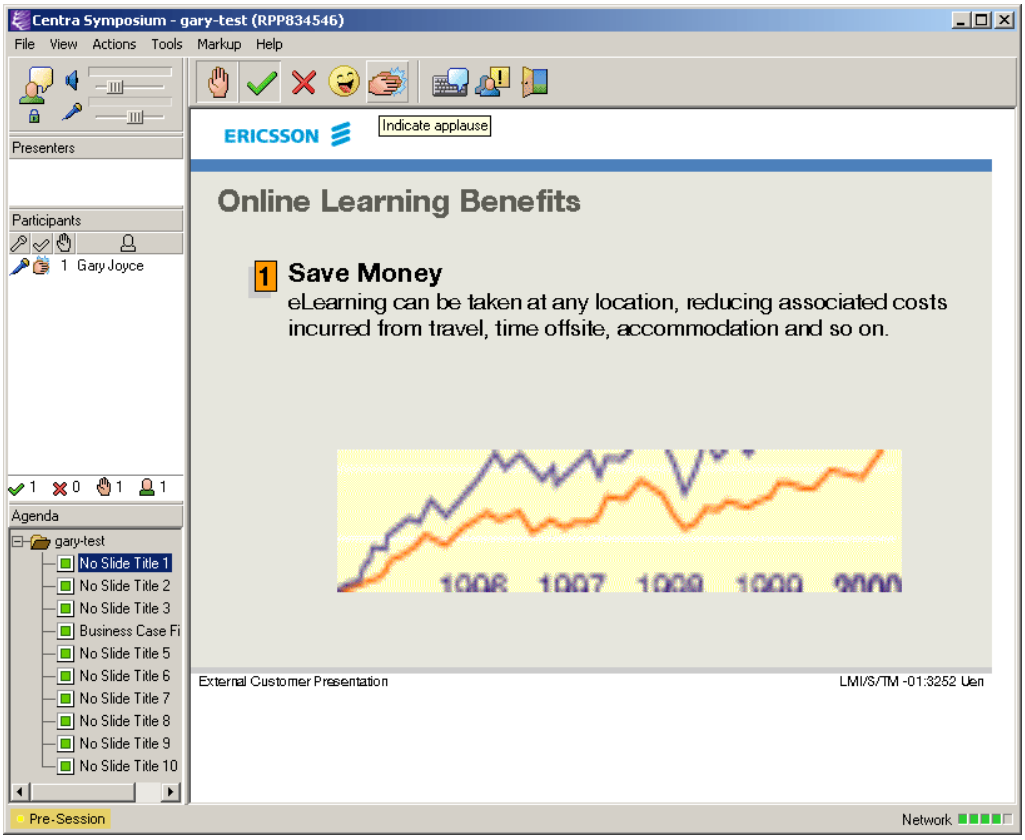
The Centra Corporation presents itself thus: 'Online business collaboration solutions from Centra create workforce efficiencies and enable organizations to share and exchange business-critical information with geographically distributed customers, partners, prospects and employees. Centra's solutions integrate real-time collaboration and departmental business processes with specialized applications that increase sales effectiveness, improve collaborative learning and accelerate enterprise application rollouts and customer acquisition initiatives'.

Based on best practices gained while working with more than 1,200 leading organizations worldwide, Centra's four solution areas - Centra for Enterprise Application Rollouts, Centra for Sales Effectiveness, Centra for Collaborative

Learning, and Centra for Customer Acquisition - automate and facilitate the planning, execution and evaluation phases of mission-critical online business initiatives. With each of Centra's four solutions, the Company has delivered all of the necessary components – a proven collaboration platform, customized workflow tools, an integrated learning content management system, third-party integration capabilities and professional services – for completing the steps necessary for successful online collaboration projects. All solutions include Centra's hallmark Voice-over-IP (VoIP) technology to realize significant savings over traditional teleconferencing services.

From this it is clear that the Centra synchronous elearning system, referred to as *Centra for Collaborative Learning,* is a component of a series of products for business communication the rest of which are not focused on education and training.

Centra Symposium, as the Centra system for education and training is called, replicates typical classroom interaction - with a complete set of features for highly interactive, effective group learning, bringing together voice, video, data and graphics in a structured online learning environment for up to 500 simultaneous users.



Centra Live Classroom presentation

In the illustration above the student interface for a course on Online Learning Benefits is shown. A more complex interface is available for the presenter.

In the centre of the presentation there is a PowerPoint slide on Saving Money. In the top left hand corner there is a box for the presenter or presenters. This has volume controls for microphone and speakers and a facility for handing the microphone to a student who wishes to speak. Below this is a box for listing the participants in the course, each with a number and indicators for indicating agreement or disagreement or wanting to 'raise one's hand' to ask a question. Opposite each name is a microphone which can be activated by the presenter to enable the student to speak. Below this is a plan of the course which lists the PowerPoint slides which are to be presented during the length of the course.

Across the top of the screen are a series of icons which indicate:

- Raise hand: to be clicked by the student if he or she wants to ask a question or make a comment
- Agree: to be clicked by the student to express agreement with a question asked by the presenter
- Disagree: to be clicked by the student to express disagreement with a question asked by the presenter
- Laughter; to be clicked by the student to indicate laughter or amusement
- Applause: to be clicked by the student to indicate applause and support for the course
- Text chat: to be used to send or receive a text message to the presenter or to all the students
- Feedback: to be used to send feedback on the course
- Volume control: to be used to control volume.

The presenter has a more complex provision of icons. This includes, in addition to the above, icons for application sharing, surveys, web safari, white board, break out sessions (dividing the students into smaller groups), video, session start and stop, recording facility.

Features provided include: Real-Time Interactivity,Yes/no polling, instant surveys, hand raising, laughter/applause, public/private text chat, and "open floor" audio chats, Multi-use, interactive whiteboards that can be saved for later review. Web Safari allows the session leader to take the participants on a synchronized Web tour. Participants can see the leader's "pointer" and will automatically scroll when the leader scrolls up and down on a Web page. Peer-to-Peer Interaction. The leader can choose to open the "floor" to several participants at a time for peer-to-peer interaction and learning. Peer-to-Peer Text Chat. Leaders can choose to enable peer-to-peer text chat that allows participants to send a private text chat message to other participants.

Further features include: Rich Multimedia Content, integrated Flash, Shockwave, JavaScript, animated GIFs, and streaming audio and video. Application Sharing with Mark-Up. Share any Windows application, including your entire desktop or even a remote server, with other participants for IT and software product training. Multiple Presenters, Just-In-Time PowerPoint Import with Animation, Breakout Rooms and Labs, Tests and Quizzes, Integrated VoIP or Teleconferencing, Integrated Video Conferencing

Currently available in 12 languages, Centra solutions can be deployed as on-site software or through its ASP service. Headquartered in Lexington, Massachusetts, Centra serves a worldwide customer base throughout the Americas, Europe, Asia and Australia. For more information, visit http://www.centra.com./

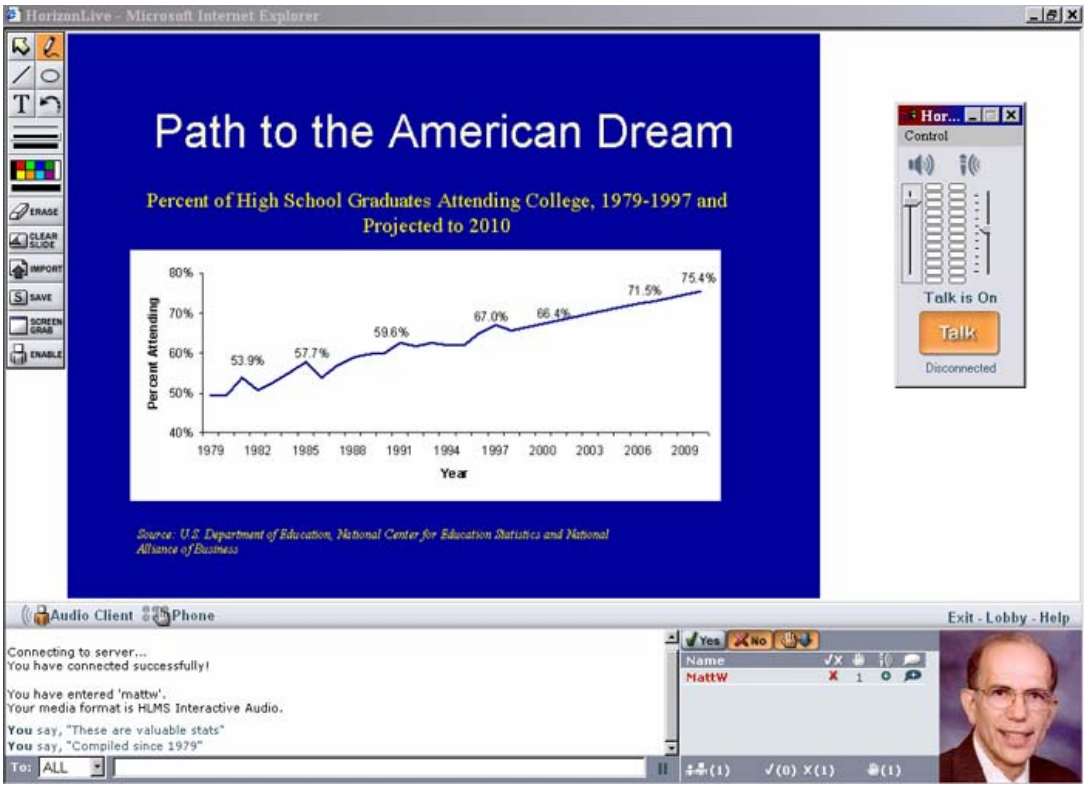
Horizon Wimba

On June 16, 2004, Horizonlive and Wimba, two well-known providers of live e-learning, formally combined to form a new company, Horizon Wimba. As part of the transition to the new company some of the existing products have been re-branded in order to maintain current market awareness of both the product lines and to better position new products in the future.

Horizon Wimba develops web-based collaboration software for online distance education, language learning and live interactive communications. These collaborative learning applications enable instructors and students to fully embrace the new wave of pedagogical opportunities afforded by campus-wide networks and the internet; regardless of geographic location, bandwidth or operating system. The virtual rooms enable instructors to conduct live, online classes, meetings, office hours and study groups, and the vocal collaboration technologies, add oral content directly into course content, webpages and assessments.

Horizon Wimba believes that approximately 1,100 universities and colleges worldwide are using a live elearning system, of which a little more than 25% use the Horizon Wimba Live Classroom for live online classes, office hours, study groups, meetings, and professional development training.

They claim that in terms of using voice tools for language learning, there are only about 200 colleges worldwide that use them, and they all use Horizon Wimba voice tools, as there is no other software company that makes voice tools for language learning. This is quite noteworthy. After all, with the prevelence of course management systems (such as
Blackboard and WebCT) there are literally thousands of language courses that have some online component, yet the majority of them do not have any speaking or listening components to them - which seems counterintuitive for learning languages.



Horizon Wimba Live Classroom presentation

Above is a presentation of the Horizon Wimba Live Classroom during a course on the 'Path to the American Dream'. In the centre screen one finds the PowerPoint slide that the teacher is describing and showing to the class. In the top left-hand corner are the tools for use during the presentation. In the top right-hand corner is the volume control for use during the course and when a student is given the microphone to address the class. In the bottom left-hand corner is the email facility using which a student can send messages to the teacher or the whole class. In the bottom right-hand corner is the administration centre. This provides facility for agreement (Yes), facility for disagreement (No), facility for asking a question (raised hand), list of participants on the course and picture of the course presenter.

Horizon Wimba list their competitive advantages as:

- We integrate with both Blackboard and WebCT
- Our Live Classroom is the only solution that is accessible to the hearing and visually impaired (very important in the United States)
- We're low-bandwidth friendly
- Cross-platform and cross-browser for both students and instructors
- Have a built-in phone back-up option for those with faulty speakers or PC microphones
- Thin-client (no thick download for dial-up users)

- We solely focus on the education market which allows us to have more enriched partnerships and integrations with other software that universities currently use.

For more information, visit http://www.horizonwimba.com.

SumTotal

Sum Total has its headquarters at 2444 Charleston Rd. Mountain View, CA 94043. Like Horizon Wimba the company was formed through the 2004 merger of e-learning software leaders Click2learn and Docent. The combined company's software and services help businesses improve their performance by educating their workforces, ensuring regulatory compliance, and improving communications with customers and partners. SumTotal's products include its Enterprise business performance management suite for improving employee proficiencies and productivity; its ToolBook suite for creating learning content and simulations; and its ResultsOnDemand learning management software.

For more information, visit http://www.sumtotalsystems.com.

LearnLinc

LearnLinc is a live virtual classroom environment that enables corporations to deliver live e-Learning courses to employees or students via the Internet, corporate intranet, or wide area network. Developed with principles of traditional learning techniques in mind, LearnLinc offers the interaction of a classroom combined with the benefits of online training. LearnLinc state that their system includes facilities that ensure instructor control of many content choices, rich interaction with students, breakout groups, plus testing and assessment - all in one simple-to-use environment. LearnLinc can be purchased as a software server license or can be contracted on a per student hour basis.

iLinc states: Our virtual classroom solution takes the traditional benefits of an interactive classroom experience and improves upon it with easy-to-use tools and features for trainers and students alike. Students are able to participate in real-time via hand-raising, chat, feedback, and Q&A technologies that allow them to gain the maximum benefit from each virtual classroom session. LearnLinc evens allows you to record an entire virtual classroom session, including audio and screen interaction, for later editing or self-paced training.

TestLinc, a companion tool for LearnLinc, was designed specifically for the web, TestLinc is the only testing and assessment tool designed to use within the LearnLinc virtual classroom environment. TestLinc is easy-to-use, full featured, and flexible, allowing instructors to give tests during a LearnLinc class or place tests in the LearnLinc Virtual Campus, accessible by students through a web-browser. TestLinc features comprehensive, web-based testing & assessment Create, publish, and edit tests Students can take tests inside or outside the

virtual classroom Grades can be automatically calculated, recorded, and published.

For more information, visit http://www.ilinc.com.

Interwise

What if your employees, customers, and partners could connect to any important meeting, seminar, or class without having to remember complicated dial-in instructions and event codes? What if they could launch a live collaboration session from their sales portal, CRM system, or project management tool? The best conferencing system in the world is only successful if people use it. Interwise makes it so easy to connect and collaborate and ties so seamlessly with other business applications that adoption rates soar.

- Integration with business process applications makes it possible to "live communications enable" your key processes and tools your employees use every day
- Any-Device Conferencing ensures that your enterprise can gain the cost and management benefits of VoIP, and your users can retain the benefits of mobile conferencing.
- Single log in for voice conferencing, as well as any-device conferencing (computer, traditional phone, AND cell phone in the same event) means users are always 1-click or one phone login away from their event - no more remembering complicated event IDs or passcodes.

For more information, visit http://www.interwise.com.

Elluminate

Elluminate is a leading provider of live Web conferencing and eLearning solutions for the real-time organization. Serving corporate and academic sectors, the company ensures the best user experience through superior quality VoIP, communications that are in-sync regardless of connection speed, broad cross-platform support, and advanced yet easy-to-use moderator tools.

Elluminate's products create a rich, collaborative environment for live remote training and online meetings, all while delivering lower upfront costs and strong ROI. Elluminate *Live!* Products, formerly known as vClass, are as follows:

- Elluminate *Live!* Enterprise Edition™, a live web conferencing environment for virtual meetings and remote training, with the ability to support dozens to hundreds of users.
- Elluminate *Live!* Academic Edition™, a highly scaleable eLearning and collaborative environment for use by academic institutions.

- Elluminate *Live!* Team Edition™, a single-room version of Elluminate *Live!* designed for small meetings, one-on-one sessions or training for a limited number of users.

For more information, visit http://www.elluminate.com.

Knowledge of and use of synchronous elearning in European education today

Since the year 2000 the European Commission in Brussels has put a great deal of emphasis on elearning in its education and training policies. It has provided extensive documentation on elearning, including *The elearning initiative* and *The elearning action plan.* An analysis of this documentation shows that all this documentation is focused on 'traditional' elearning. There is little, if any, reference to synchronous systems or live elearning or virtual classrooms.

It was imperative, therefore, to carry out research on the knowledge of synchronous elearning systems amongst European trainers and training institutions today. A further level of the research was to collect data on the use of synchronous elearning systems amongst European trainers and training institutions today.

Methodology

The goal was to collect data from 28 countries in Europe: the 25 member states of the European Union, including the 10 new members who joined the European Union in May 2004, plus Norway, Romania and Switzerland.

The methodology proceeded in various stages:

Stage 1. Development of a joint questionnaire to be used in each of the 28 countries on the knowledge of and use of synchronous e-learning systems in European institutions.

Stage 2. Identification of a leading expert in e-learning in each country. Negotiation with the expert to get his or her support for participation in the project.

Stage 3. Identification by the national expert of four other leading experts in e-learning in the country.

Stage 4. Telephone interview. The five experts in each country were then interviewed by long-distance telephone calls to explain the project to them, to get their support for participation and to ascertain whether they wished to complete the questionnaire by telephone interview or by email.

Stage 5. The questionnaire was then dispatched to the experts and completed by them.

Stage 6. Data was then collated and the report written.

It is considered that this methodology provided valuable data. The development of a joint questionnaire for each country in Europe gives the basis for the data collection. It is acknowledged that the number of five experts for each country is small, but it is considered that valid contributions can be made because all are carefully selected experts in the sector with wide knowledge of the provision of synchronous elearning in their countries. The telephone interview is an important dimension of the methodology as it gave all the participants knowledge of and commitment to the aims and goals of the project and the possibility of explaining exactly what was the goal of the research.

Examples of sample

Data was collected from 28 countries: the 25 member states of the European Union and Norway, Romania and Switzerland. In each case leading authorities in elearning were identified and contacted. These were persons who knew the national scene well, who were acknowledged experts in elearning in their countries and who would know the presence of synchronous elearning systems in their countries. An example of the institutions that these experts worked at is given below. Similar authorities were identified and contacted in the other countries not listed.

BELGIUM: representatives from the University of Liege, Belgacom, Universite Libre de Bruxelles, Catholic University of Louvain, Universite de Mons-Hainaut

ESTONIA: Miksike, a private institution

FRANCE: European Institute for E-Learning in Paris, Department of Mathematics at the University of Poitiers, Poitiers, Communaute de Communes de Parthenay, Deux Sevres

GREECE: ERGON KeK, Greece, Lambrakis Institute, Athens

HUNGARY: University of Debrecen, University of Miskolc, Eötvös Lóránd University, SAP Hungary, MATÁV Hungarian Telecommunication Company

IRELAND: ISCN, Bray, Co Wicklow, Webfios, Cork, Co Cork, Dublin Institute of Technology (DIT), Oscail, National Centre for Distance Education, University of Dublin, Trinity College

ITALY: ITSOS Marie Curie, Istituto Tecnico Commerciaiale Statale “Mario Pagno”, INValSI (National Institute for Evaluation of Education System), based in the University of Rome 3,
CGIL, Scienter, Bologna

LITHUANIA: Lithuanian Distance Learning Network (LieDM)

THE NETHERLANDS: Charkov Beeher in Nijmegen, Hogeschool van Utrecht, Ericsson Training at Rijen

POLAND: The Court in Bialystok

PORTUGAL: TecMinho, Guimaraes, INOFOR, Lisbon, University of Minho, Universidade Aberta, Lisbon, Sociedade Portuguesa de Innovacao, Porto

ROMANIA: Babes-Bolyai University, Indaco s.r.l., AC Helcor

SLOVAKIA: Technical University of Kosice, Hans Selye University, Constantine the Philosopher University, Heineken Slovensko, a.s., SAP Slovakia

SLOVENIA: University of Maribor, University of Ljubjana**,** Gorenje d.d.

SPAIN: Fundacion General of the University of Valladolid, Valladolid, Professional Association of Industrial Engineers of Catalonia, Catalan Institute of Technology, Universidad Oberta de Catalunya, CEDETEL, Universidad Politecnia de Cartagena

UNITED KINGDOM: CREATE Institute at Suffolk College, Ipswich

Research structure

1. Central and Eastern European countries

In the framework of the Virtual Classroom project a survey was carried out by using a brief questionnaire on the present use of virtual classroom environments in European institutions in the following countries:

Hungary
Poland
Romania
Slovakia
Slovenia

In each country institutions were selected, both public and private institutions to analyse how they make use of virtual classroom education and training. Here is the list of both government and corporate institutions:

Hungary	Poland	Romania	Slovakia	Slovenia
University of Debrecen	Court in Bialystok	Babes-Bolyai University	Technical University of Kosice	University of Maribor
University of Miskolc		Indaco s.r.l.	Hans Selye University	University of Ljubjana
Eötvös Lóránd University		AC Helcor	Constantine the Philosopher University	Gorenje d.d.
MATÁV			Heineken Slovensko, a.s.	
SAP Hungary			SAP Slovakia	

The list of institutions which have received the questionnaire

Methodology

In each country a contact person was identified who was in charge of sending out the questionnaires to the targeted institutions. Despite the direct contact that they had with the institutions, the return level was 60%, 12 out of 20. The possible reason for this was the feeble market presence of the VCT systems and the fact that they are not widespread in the region. Then interviews by telephone were carried out in order to increase the base of analysis. Having done the telephone interview with the partners we were able to get answers and personal opinion in more detail. In addition it turned out to be a really efficient way to evaluate the general attitude toward the VCT systems. Finally we outlined the role of the cultural differences in the final section of the study.

General findings

Having done several enquiries by email, phone and questionaires it was possible to form a general idea on the caracteristics of the VCT usage in the regions. So taking into account all the information received from the institutions the following general statements could be concluded:

- Institutions in the region have insufficient knowledge on VCT systems and methodologies
- Cultural differences create barriers in the successful implementation and operation of the VCT systems

- The underdeveloped IT infrastructure prevents the users from the complete realisation of the benefits
- Resistance against the new forms of teaching methods and restructuring in the universities. On the other hand the private sector is more open toward VCT systems.
- Majority of the institutions questioned have intended to introduce different forms of e-learning systems in the future.

In the Central European countries the different forms of the virtual classroom technologies are hardly known. The institutions with access to a VCT system use the system for several purposes. Those institutions using VCT systems clearly understand the possible advantages and benefits of the VCT systems however they can point out a couple of drawbacks as well.

Finally we have seen a high rate of willingness to use VCT systems in terms of those institutions who hadn't installed any of those programs before.

Conclusions

In the Central and Eastern European countries the different forms of the virtual classroom technologies are hardly known. 50% of the institutions questioned answered that they had never come across those VCT technologies mentioned in the questionnaire. High percentages of the institutions are not even aware of the definitions of Virtual Classroom Education and Training technologies. In addition the institutions questioned who are using a VCT specified other application than the ones in the questionnaire.

Besides the advantages they could identify several drawbacks of the VCT systems such as:

- Absence of face-to-face communication
- Low rate of Internet penetration
- Cultural differences
- The lack of control on the participants
- Underdeveloped IT infrastructure

In question 7 the majority of the institutions answered that the use of VCT systems in their country is quite sparse and rare. Though almost all of the answers showed a high intention to continue using VCT systems in the future. Moreover those institutions which haven't installed any of those programs before are planning to use them.

Facilitating and inhibiting factors

The Central and Eastern European region covered by the survey has a cultural background involving historic interconnections with the German culture. This

characteristic certainly influences the propensity to take up new technologies like VCT.

The analysed countries are on the individualistic side of the individualism-collectivism dimension of national cultures which would facilitate the take up of VCT systems. There are however other factors listed below which are rather inhibitors.

Education in these countries has a strong tradition showing many successes in the past, and by consequent actively or passively opposing forces of change, even if these changes have to take place sooner or later due to the progress of the development of the information society and the accompanying increase in the demand for education.

Another important inhibiting factor is the short term cost inefficiency of VCT systems. VCT requires considerable investment at startup, on which there is a return most of the time only if savings are realized on either traveling or time spent out of work. Since the analysed Central and Eastern European countries are relatively small, travel costs are not considerable. Time spent out of work is definitely considered by multinational companies on the other hand, which are sensitive to ROI.

The relatively low penetration and the high cost of Internet in Central and Eastern European countries is a factor which cannot be neglected either, strongly inhibiting the spread of VCT especially in public education services. In-house corporate education shows more promise on the other hand.

2. Austria, Germany and Switzerland

The report is based on the data of a questionnaire sent to institutions which are involved in VCT applications.

Research method

In the first stage the institutions were selected. This was done by looking through the list of exhibitors of the Learntec 2003/2004 in Germany and the e-Eduction 2003 in Switzerland. Then there were contacts with experts known from the annual international meetings of the *Gesellschaft für Medien in der Wissenschaft*.

At the end the result was 32 adresses/persons who are engaged in VCT applications or elements of it were identified. These institutions are universities, colleges and private organisations - mainly suppliers in further education.

These were the basis for the research in these countries.

Conclusion

At the end of the data collection there were data from 13 institutions available (Austria 4, Germany 4, Switzerland 5), done in form of email-questionnaire and telephone interviews.

In general the statements of the respondents verify that VCT application are not often used in these countries. Only IT enterprises have a worth mentioning use of VCT applications.

As purpose of use mostly formal education courses and the distribution of product information are mentioned.

The respondents explain that financial aspects and technical restrictions seem to be the main reasons for not using VCT systems. Moreover the missing of non-verbal communication and the additional expense in preparing the virtual classroom session are mentioned.

For the future most of the respondents expect a growing use of VCT systems - in a wide range of intensity: from 'a strategic element of the activity' to 'not systematically, only for projects'.
Though: VCT systems cannot be used universally – it depends on the target groups and the preknowledge of the participants.

Another argument concerns in house communication of a "global player": communication and knowledge–flow has to function worldwide – that demands a intensified combination of classroom and eLearning for an optimal learning success in relation to the expense (Blended learning).

3. Scandinavia

Introduction

It is a basic assumption in the project that synchronous e-learning is not very widespread in the European countries, as opposed to the United States. The investigation presented in this report serves to underpin this assumption with empirical data from Scandinavia.

Main research questions

The main research questions of the investigation are:

- On an overview level, is there a general knowledge of the major VCT systems in Scandinavian institutions, government and corporate?
- On an overview level, what VCT tools are used, for what purposes and with what success?

An initial set of informal telephone inquiries to possible recipients of the questionnaire in Scandinavian countries revealed that in many cases, VCT as defined in the project is not applied by the institution, but related forms of e-learning take place. It is of interest to the project to capture what these alternative approaches are. The following research question was therefore added to the general questionnaire:

- If VCT according to the project's definition is not being used in the institution, what similar approaches, if any, are used?

Selection of data sources

Data was collected from a selection of Scandinavian institutions, corporate and government. The selection was based on the institutions' size and status as likely users of VCT technology. The goal was to have at least five completed questionnaires from each Scandinavian country.

The actual number of recipients completing our questionnaire was slightly smaller. However, informal, oral communication with various information sources added to the total amount of data. Also, some of the organisations contacted were representative of two or more Scandinavian countries. We therefore regard the collected data as suitable for our overview level analysis.

Data collection

Telephone inquires were made to candidate recipients with subsequent distribution of the questionnaire via email, and if necessary reminders via email and/or telephone. Many questionnaires were distributed via 'contact brokers' with good networks in the relevant area, but the response rate was zero in these cases. Personal knowledge of contacts in candidate institutions as well as contact information from the organisation's webpage were used as starting points, with subsequent inquiries for 'e-learning manager', 'person responsible for internal training' etc. or - in some cases - 'the human resources department' or 'head of the computer department'. In most cases, it was possible to get in touch with a person with an adequate role in the organisation. In some cases, it was difficult to identify the right addressee.

It proved necessary to talk to the person receiving the questionnaire in order to have it completed and returned.

In a couple of cases the respondent preferred to answer the questions over the telephone. In most cases, the respondents answered in writing, using email attachments. We had some answers indicating only that the organisation in question did not use VCT, which is useful information, even if the questionnaire

was never completed. Several recipients promised to complete and return the form, but failed to do so.

The overall response rate was, roughly estimated, about 25%.

The approach to data source selection and the limited number of respondents means that the results of the investigation should be regarded only as an indicator of the general knowledge of, and use of, VCT technology in Scandinavia. However, the findings profit from the wide range of organisation types represented in the survey. Also contributing to the value of the results, a few of the respondents were knowledgeable of state-of-the-art of VCT in their country well beyond their own organisation.

Findings from the Scandinavian survey

Viewing the survey data in the light of our initial research question, it is possible to identify some tendencies:

- Among the Scandinavian respondents we find representatives from all of the following groups:
    - No knowledge of VCT, no present use in the organisation, no plans for using it (Some respondents in this group failed to return the questionnaire for this reason.)
    - Knowledge of VCT, no present use in the organisation, no plans for using it
    - Knowledge of VCT, no present use in the organisation, planning to use in the near future
    - Knowledge of VCT and present use in the organisation
- There are no obvious differences between the Scandinavian countries in respect of the answers to our research questions. Very tentatively, Finland seems to have a slight lead.
- Larger organisations seem more likely to be VCT users than small ones.
- Companies with dedicated e-learning managers or similar roles in their organisation generally have better knowledge of VCT and use it more.
- Centra seems to be the tool most applied among the organisations we contacted, but it does not control the market.
- Companies or educational institutions with information technology among their business or research areas are not necessarily pioneers at the use of VCT in their internal training.

- In general, the most advanced users of VCT seem to be found among corporate institutions and not among universities and research institutes

Conclusion

The conclusion is that synchronous e-learning does take place in many Scandinavian organisations, but the survey does not indicate that it is very widespread.

4. Italy, Greece, UK and Ireland

The premise of the SOCRATES/MINERVA-sponsored project "Virtual Classrooms in Educational Provision" is that virtual classroom software, as typified by products such as Centra, LearnLinc and HorizonLive, have received little attention on the European e-learning scene. This despite the success of – mainly American – Learning Management Systems in 'cracking' the European training and education market.

This initial survey, though admittedly small in scale, aimed to establish, in the first place, whether this was, in fact, the case, whether virtual classroom software was, as the project team suspected, relatively unknown in the European context. The survey also aimed to establish from those, however few or many there might be, who did use such systems which systems they used and what the nature of their use was. Both users and non-users of VCT systems were also invited to comment on what they felt to be the advantages and disadvantages of the VCT approach, as well as indicating how widespread they felt the use of such systems to be in their respective countries and whether their institutions planned to use VCT systems in the future.

The relatively small number involved in the survey was, to some extent, counterbalanced by a careful selection of respondents by the authors, all known to them as experts in the e-learning scene both in their own respective countries and in the European context in general; most are long-standing partners of the DEIS Department for Education Development in the Cork Institute of Technology in a number of other ongoing EU-funded initiatives. Such respondents then were well placed to answer questions such as "how widespread is the use of VCT in your country" and questions as to the pros and cons of such systems by contrast, for example, to asynchronous virtual learning systems.

Even so, however, it proved difficult in many cases to reach the quota the project team had set from themselves per country. This can be explained in part, no doubt, by the large number of such surveys now finding their way to the mailboxes (electronic and otherwise) of those involved in the e-learning scene in Europe and also by the native reluctance by many working in the field to provide

sensitive information as to the extent and success of the efforts of their respective institutions and organisations in this still relatively new area. Previous experiences of the authors on other projects have shown the difficulty in getting specific information as to what is going on e-learning-wise within, for slightly different reasons, both traditional FE and HE institutes and corporate organisations.

In the opinion of the authors it is perhaps the fact, despite the overall conclusions of this survey, that the premise of the "Virtual Classrooms in Educational Provision" is so accurate that respondents were reluctant to supply answers as to their knowledge and use of these little-known systems – had this been a survey, for example, of LMS use perhaps responses would have been more forthcoming.

The survey of course was specifically concerned with VCT software, rather than any other e-learning technology, yet in some cases this distinction was hard to maintain. Answers from some respondents seemed to imply some confusion in their minds as to the distinction between VCT software and Learning Management Systems. The distinction is of course more than a little blurred in reality when we consider that all commercial LMSs have traditionally offered basic synchronous communication tools and many, like Blackboard, are now making VCT functionality available in the latest editions of their systems or, like WebCT integrating existing tried-and-tested VCT software into their systems (in WebCT's case the integrated system is HorizonLive).

5. France, the Netherlands, Belgium, Portugal and Spain

Methodology

Leading experts in elearning from each of the five countries were identified.
Extensive long-distance telephone interviews were held with each of them.
Each identified four other experts in elearning in their countries.
Extensive long-distance telephone interviews were held with each of these, explaining the exact nature of the research and seeking their participation.
The official questionnaire form was sent to each by email.
They all replied by email to the questionnaire. 22 replies were received from the 25 experts identified.

Results

The view that virtual classroom systems (VCT), or live e-learning or synchronous e-learning systems, are little known and little used in Europe is supported. Usage was less widespread than knowledge with few institutions using VCT for formal education and training. Some of the institutions in Spain and Portugal that were using the technology claimed that there was an element of VCT in all of their courses. The advantages and disadvantages of VCT were well known and there

was an even balance between favourable and unfavourable evaluations. It appeared that institutions that were already using the systems would continue to do so.

Results

The view that virtual classroom systems (VCT), or live e-learning or synchronous e-learning systems, are little known and little used in Europe is supported by this survey. Although nearly all respondents stated that they were aware of VCT this awareness appeared fragile and there was little in-depth knowledge of the systems.

This is at a time when the evidence from America is that these systems are gaining ground and more and more of the vendors of Learning Management Systems are having to incorporate a synchronous dimension in their systems if they wish to maintain market share.

Usage was less widespread with few institutions using VCT for formal education and training. In those institutions and countries where an attempt to measure the presence of virtual classroom systems in education and training provision the figure given was less than 5%.

Some of the institutions in Spain and Portugal that were using the technology claimed that there was an element of VCT in 100% of their courses.

The advantages and disadvantages of VCT were well known and there was an even balance between favourable and unfavourable evaluations. In Spain the Open University of Catalonia was a leader and had developed its own system, Virtual Campus. In Hungary, too, there was extensive use of Virtual Classroom systems at higher education level by the Budapest University of Economic Sciences and Political Science.

It appeared that institutions that were already using the systems would continue to do so.

References

Land D, Experiencing the online environment
http://www.usdla.org/html/journal/FEB02_Issue/article05.html
Acterna, Acterna's virtual classroom
http://www.acterna.com/global/Training/eLearning/VirtualClassroom/index_gbl.html

Keegan D and Landers P, The role of live e-learning in education and training systems. Proceedings of 2004 ILTA conference, Tralee Institute of Technology, Ireland.

Jennings A et al, Experience in the use of synchronous elearning in a traditional university with non-traditional learners. Proceedings of 2004 ILTA conference.

Hofstede, G. (1994). Cultures and Organizations, Software of the Mind: Intercultural Cooperation and its Importance for Survival, McGraw-Hill, London, 1994.

Biró,M; Messnarz,R; Davison,A.G. The Impact of National Cultural Factors on the Effectiveness of Process Improvement Methods: The Third Dimension. Software Quality Professional (ASQ~American Society for Quality) Vol.4, Issue 4 (September 2002) pp.34-41. (http://www.asq.org/pub/sqp/past/vol4_issue4/biro.html)

Appendix

Here is the questionnaire used in the preparation of the report:

Brief questionnaire on the present knowledge of and use of virtual classroom environments in European institutions

Name	
Date	
Job Title	
Institution Name	
No of employees/students	
Institution Category	
Email	
Telephone	

About the project

The project *Virtual Classrooms in Educational Provision – Synchronous Elearning Systems for European Institutions* is part of the Socrates research programme funded by the European Union.

The project partners are:

- Ericsson Competence Solutions, Ireland (coordinating institution)
- Budapest University of Economic Science and Public Administration, Hungary
- FernUniversität-Gesamthochschule in Hagen, Germany
- NKI, Norway
- Cork Institute of Technology, Ireland

The aims of the project are:

- to analyse how European institutions (government and corporate) make use of virtual classroom education and training (see definition below)

- to evaluate pedagogical and technical aspects of current virtual classroom environments
- to develop and test a portifolio of courses for virtual classroom education and training
- to produce a manual of virtual classroom Best Practice for European institutions
- to identify advantages of virtual classroom environments over alternative teaching environments

The current stage of the project is one of *data collection about the use of virtual classrooms among relevant European institutions*. Analysis of the data will result in an initial project report. Based on further analysis of the pedagogical and economical aspects of virtual classroom provisions, test courses will be developed, implemented and evaluated in context of the project partners' institutions. The findings of the project will be made publically available, to the benefit of European institutions.

Virtual Classroom Education and Training (VCT) is also known as Live e-learning or Synchronous e-learning Systems and may be defined as systems which

- use the Internet to deliver education and training
- use a WWW browser as a major delivery medium
- have an instructor and a group of participants (class) assembled at a fixed time and for a fixed period
- manage communication electronically
- make use of a system like Centra or similar

Section A - General Information

Q1) *Referring to the definition above are you aware of Virtual Classroom Education and Training (VCT) technology?*

Yes	No

Q2) *Which of the following VCT applications are you aware of?*

Name	Vendor	*Please tick*
Centra	Centra	
E-Learning-on-Tap	Hewlett Packard	
InterWise Millennium 3.0	InterWise	
LearningSpace 4.0	Lotus Development	
LearnLinc 5	LearnLinc	
HorizonLive	HorizonLive.com	
Other (please specify)		

Q3) *Which of the following VCT applications have you used?*

Name	Vendor	*Please tick*
Centra	Centra	
E-Learning-on-Tap	Hewlett Packard	
InterWise Millennium 3.0	InterWise	

LearningSpace 4.0	Lotus Development	
LearnLinc 5	LearnLinc	
HorizonLive	HorizonLive.com	
Other (please specify)		

Section B - VCT in your institution

Q4) *Does your institution use virtual classroom technology or have access to a virtual classroom system.*
If yes please proceed to the subsequent questions in this section, if no please proceed to section C.

Yes	No

Comments

_____

_____

_____

Q4a) What purpose do you use it for (Please tick all relevant options).

Distribution of product information e.g. product updates	*Please tick*
Formal education courses	
Distribution of information e.g. updates to staff, new processes etc	
Other, please specify…..	

Q4b) *Approximately how many people from your organisation have taken at least one VCT session last year?*

Range	Number
1 - 10	
11 -20	
21 - 30	
More	

Q4c) *For people that have taken a VCT session please indicate the total number of people in each of the categories in the table below?*

Sessions last year	Number
1 - 2	
2 - 5	
5 +	

Q4d) *Of the formal training courses offered by your institution, what approximate percentage contains a VCT element?*

Section C - General Comments

Q5) *Advantages offered by VCT*

Please detail your opinions on the principal advantages offered by VCT technology.

Q6) *Disadvantages of VCT*
Please detail your opinions on the principal disadvantages of VCT technology.

Q7) *In your estimate how widespread is the use of VCT in your country?*

Q8) *Does your institution plan to use VCT systems in the future?*

Thank you for your contribution.

Chapter 2

Pedagogical issues

Eva Schwencke

This chapter discusses some central pedagogical issues concerning use of the Virtual Classroom. When developing the Virtual Classroom as a supplement to, or even a substitute for traditional local classroom-based teaching, one central issue is how to make students more active participants. The challenge of creating active student participation is inherent in all structural classroom contexts regardless of the technology used. Student participation is always a technical and practical challenge, but most of all it is a pedagogical challenge, since active student participation in the learning process is significant for the learning result. The question here is to what degree VCT makes it possible to facilitate active student participation in the learning processes, and what are the necessary conditions for this technology to be exploited to its full potential.

Virtual synchronous teaching, training and learning – a broadened e-learning concept

Recent years' technological development with sound and image on the Internet, with high speed and low costs, offers a steadily improving technological learning environment in distance learning (Rapanotti et al. 2002). These new developments are likely to create opportunities both in traditional college and university teaching and for the increasing development demands in business and industry as well as for their need to educate and train employees. Each participant has her/his PC with a headset and microphone, either at home, in their workplace or at school, and participates at a simultaneous teaching session.

Many different approaches to the use of VCT exist, and a number of different terms are used for this technology. The unique aspect of the virtual classroom technology, however, is the flexibility of having classroom teaching sessions at scheduled times and duration, with students in multiple locations (Driscoll 2001).

The definition of "virtual classroom" (VCT), as it is designed for this part of the Socrates Minerva project, includes this flexibility and at the same time offers technological opportunities for a high degree of interactivity among participants. This may have great potential.

1. The Internet is used to deliver education and training, with a *WWW browser* as a major delivery medium.
2. There is an instructor and a group of participants (class) *assembled at a fixed time and for a fixed period.*
3. Small group discussions may be arranged in separate *breakout rooms.*
4. The virtual classroom sessions *determine the pace of student study*.
5. Communication is managed electronically, *with voice contact* between teacher and students.
6. Pedagogical features like *video broadcasts, text chat, whiteboards, Power Point type presentations and application sharing are available*.
7. Students have the advantages of the *flexibility of studying* on their own and the social advantages *of belonging to a learning group*.

Figure 1: Definition of VCT formlulated by Desmond Keegan, in Krogstie (2004).

This definition emphasises some central characteristics. The virtual classroom is distinguished from traditional e-learning by the fact that interaction takes place synchronously, i.e. that the virtual classroom is similar to the traditional face-to-face classroom in that there is *one* instructor and *one group* of participants who are gathered at *a particular time* and for *a particular duration* (Paulsen 2001, Keegan 2002). The virtual classroom is different from e-learning by being group-based and not primarily individual-based, thus simulating the physical classroom. Another important difference between traditional e-learning and VCT is the fact that communication between teacher and students takes place orally in addition to textual communication. This offers a new dimension additional to distance learning, in that aspects of human dynamic communication are preserved. On the other hand this VCT technology does not include the use of images and thus differs from permanent video support and image phones. However, using the Internet and the classroom model, the technology offers opportunities for collaborative interaction between participants, for small-group based text chat discussions, for the use of video films and for application sharing, among other things.

Experiences from the experiments at NITH/NKI

At the Norwegian School of Information Technology (NITH) two experiments with virtual classroom technology have been carried out at master's degree level (Krogstie 2005) in connection with the Socrates Minerva project. The results open up for the possibility of using VCT to strengthen NITH's potential as an IT university college, in that this technology makes cross-campus knowledge more feasible.

One of the aims of the Socrates Minerva project was to test and evaluate the use of VCT in the study programmes. Two experiments were carried out at NITH in 2004 by Assistant Professor Birgit Krogstie (2005), using Centra Software's virtual technology and tested on master degree programmes in information technology. Results show that the crucial question is whether the virtual classroom gives sufficient framework conditions to carry out pedagogically facilitated teaching as a substitute for the traditional classroom, or whether it should be seen as a feasible supplement. The findings show that what students miss is the interactivity; the lack of collaboration between student and teacher as well as among the students is emphasised. The experiments were combined with questionnaires researching the students' attitudes to VCT, and the results are summarised as follows in the final report (Krogstie 2005).

Strengths:

- Globalisation; saving time and costs;
- Flexibility; short-notice decisions, the possibility of being combined with other types of teaching (*the flexibility is greater when students use their home-based computers rather than gathering in the college computer rooms*);
- Efficiency; better planning and structure, storyboard;
- Access to a lot of content on the Web; this can be used for learning/teaching.

Weaknesses:

- Lack of human contact;
- Lack of co-students and student collaboration;
- Lack of interactivity, static and monotonous;
- Difficult to support problem-based learning;
- No possibility for "hands-on";
- Vulnerable technology; a great deal of previous knowledge and preparations are required;
- High cost investments.

Figure 2: Experiences so far (Krogstie 2004)

The experiences gained from the experiments were later addressed as:

The main findings are:

- Testing of technical equipment and presentation approach/material is essential to the success of arranging the real course. Provided technical stability (particularly the sound quality), participants' virtual classroom tool training can be integrated into their first 'real' session with the tool
- The advantage of the flexibility offered by the virtual classroom partly justifies the sacrifice of the rich interaction offered in the ordinary classroom, but he virtual classroom is appreciated by many as a possible *supplement* to 'the real thing' and not as a substitute for the ordinary classroom
- A traditional lecture may be transformed from an ordinary classroom presentation to a virtual classroom presentation, keeping the original structure of the lesson. However, surveys and tests should be included at fairly short intervals throughout a session, and graphical materials are essential.
- Success is dependent on motivation: Both students and lecturers must accept the limitations and appreciate the opportunities of the virtual environment. The attention span seems to be shorter than in a real classroom.

Figure 3: Main findings (Krogstie 2005)

As this researcher has not participated in the experiments at NITH, Krogstie's results and experiences are presented here with the purpose of illustrating some general features of VCT.

It appears from the results, shown in Figure 2 and Figure 3, that the VC sessions may be perceived as monotonous and boring. This often affects concentration, and the students also find that in reality there is little opportunity for interactivity through participation and discussion. Based on these experiences, the virtual classroom seems to give less benefit than participation in a physical classroom, unless the limitations of VCT are addressed properly and its opportunities appreciated and exploited.

The main question is what opportunities VCT gives for interactivity. And in order to make the pedagogical reflections on VCT concrete, it is important to address the issue of what distinguishes the physical classroom from a virtual classroom.

The following sections discuss theoretically, independent of the mentioned experiments, some pedagogical issues concerned with the opportunities and limitations that have to be addressed for VCT to become a good pedagogical tool.

Interactivity in a virtual classroom

The concept of interactivity in a teaching/learning situation comprises all forms of mutual communication between teacher and students and among students, as opposed to one-way communication in the form of a teacher monologue. The discussion about interactivity is often concerned with the level of activity – how active students can or should be as participants in a teaching situation – and how important student participation is for learning.

How relevant is it to discuss the possibilities for interactivity with the use of VCT, or is VCT a technology adapted for one-way communication? Should the use of IT for teaching purposes be seen as on the one hand an objectivist model where technology is a means for transfer of knowledge and instruction, and on the other hand a constructivist model where technology is seen as a tool to support communication (Benbunan-Fich 2002)? Based on this categorisation VCT must be seen as supporting an objectivistic approach to learning, as opposed to group support systems that cater for collaborative learning. Or is it possible that the two approaches to learning can be seen as overlapping? Discroll (2001: 6), who represents Centra Software, one of the main suppliers of VCT, claims that, "… interaction in a live, online training session is extremely important". This signalises that a constructivist approach is highly relevant when facilitating the virtual classroom. These main approaches are discussed theoretically below.

Pedagogical approaches

Before discussing the opportunities for interactivity with VCT, a short presentation of general theory of education will be necessary. The differences have been severe in pedagogical debate, partly along the lines of philosophical debates that have their basis in natural scientific and humanistic thinking. For our purpose it can useful to look at two general main approaches, namely behaviourist/objectivist and constructivist approaches, although there is a certain degree of overlap between the two. A common feature of the two is their purpose of good learning. Behaviourism is mainly associated with B. F. Skinner and is characterised by modification of behaviour through stimulus response. Learning can be observed as changed behaviour in the learners; furthermore, learning takes place through the transfer of knowledge with the students as objects for the teacher. Constructivism is first of all associated with scholars such as Jean Piaget, Lev Vygotsky and John Dewey (Melling-Olsen 1990, Strømnes 1993, Illeris 2000), and is characterised by its view of the learners as active and autonomous subjects that construct their own learning. Learning is internally managed through the subjects' interest in solving problems through individual experiences. Aspects of knowledge development include listening to resource persons, studies of theory, critical thinking and reflection, and personal growth through meaningful and real-life activities. The tutor's role is that of knowledge contributor and resource person as well as facilitator of the learning environment.

Interactivity

Is it necessary for the students to be active participants in the teaching sessions, or do they learn just as much through listening to the teacher's presentations? Today the general view is that it is important that the students both listen and participate actively, and that there is mutual communication between students and tutor. It is the learning content and the goal of the course that decide to which degree the students should be involved, and there is a difference between theoretical and practical subjects.

Behaviourist approaches focus on the teacher as solely responsible that learning takes place, and on the teacher's presentation of the subject matter as the basis of the teaching process. Learning takes place as memorising, performing tasks based on detailed instructions, and repetition. It is important to receive response on the stimuli that are transmitted, and this is done through short tests with verifiable contents. Prompt feedback with a focus on positive comments is important to enhance learning. Thus, it is the short-term verifiable results for the individual student that constitute the teaching product, and the learning process as such is secondary to the presentation and the goal.

The constructivist approach regards active participation on the part of the learners as the teaching foundation, and the lecture as an important contribution

to the students' own knowledge formation. The important aspects of teaching are that students regard the content as meaningful, that there is room for students to ask amplifying questions in cooperation with fellow students and to try out their own reasoning and use their own examples in order to understand and reflect on the subject matter. The role of the tutor is thus to facilitate the development of curiosity, both an inquiring and an evaluating attitude on the part of the students, so that they are able to participate in a meaningful way in the teaching situation. The constructivist approach thus focuses on the process of learning rather on the learning result at any given time. It challenges the traditional roles, that of student and tutor as well as that of instructor and participant, in order to make them more synchronous, that is active-active instead of active-passive.

Historically, behaviourist and constructivist approaches have been strongly opposed on the issue of whether to focus on the learning process or the short-term learning result. It seems that the tension between the concepts of process and development on the one hand and the linear productivity concepts on the other (Svensson 2000) takes on an increasing importance in organisations other than teaching institutions. The concept of organisational learning (Argyris 1992) has softened the division between the two approaches. There is now a greater degree of transition between the two major schools, and there is more focus on students' active participation in the learning processes and interactivity in the teaching. This is expressed by Jonassen & Land as the "sociocultural turn" in the theories of learning and education (Lahn 2004:76). Thus, the issue of students' active participation in the teaching situation is in focus.

The following section will elaborate on the characteristics of the virtual classroom and the special challenges and opportunities made possible by facilitating for interactivity.

What is similar, and what are the differences between VCT and a physical classroom?

For better or for worse, the virtual classroom in many ways resembles the traditional classroom: synchrony, the teacher as communicator, use of foils and black-/whiteboard as teaching aids, students who raise their hands, group sessions, communication between the teacher and the students and among the students, and so on (Driscoll 2001). These similarities make the transition from a traditional classroom to VCT less severe, apart from the technical requirements. Also, much of the traditional learning material can be used in the virtual classroom (Krogstie and Bygstad 2005).

The differences are not numerous, but it is important to be aware of them and take them into account. Especially visual communication constituted by body language disappears using technology as a medium in VCT, in particular when cameras are not used (compare the definition in Figure 1). What effect does this have on the learning environment, and how can the challenges be met?

The most important challenge of this learning technology is the limitations it poses for human contact; body language is no longer the central part of communication as it is in traditional classrooms. Non-verbal communication makes it possible for both the teacher and the students to influence the interaction between the parties in the communication situation. Signals sent out by the interlocutors may give unpredictability and new directions in the teaching situation, which an experienced teacher knows how to deal with and use. Non-verbal communication expresses the silent knowledge and the communication that are integrated in explicit and formal knowledge and communication. The teacher can direct the teaching situation by creating contact based on her/his interpretation of the signals sent out by the students, and will have full overview of the participants. This makes face-to-face situations unique. Students on their part know the traditional learning environment well enough to make conscious use of non-verbal communication; thus, spontaneity and continuous adaptation may take place and a dynamic learning situation is created.

This aspect of the teaching situation is not present in distance learning, whether synchronous or asynchronous, unless image transfer of the participants is used. In a way one can say that there is flexibility at the expense of body language – the use of electronics is a means to facilitate the participation of many people regardless of where they live. The challenge is then how to compensate for the missing body language and make VCT a good learning environment.

Information technology as a medium

The use of IT abstracts reality (Lahn 1998); the silent relations disappear. Thus, when communication takes place through the electronic medium, an extra learning barrier is created. All interaction must therefore be made explicit and visible, for example through the Centra Software system using icons to be clicked to signal hands raising or to express positive or negative reactions, and so on. When a student wishes to speak this must be made by clicking the hands-raising icon, after which the teacher allocates the use of a microphone. This extra barrier of the virtual classroom requires a conscious act on the part of the students to signal their wish to express themselves, by clicking an icon to perform an act that in the real classroom could be expressed through non-verbal communication. The virtual classroom loses the spontaneity that is one of the basic elements of the traditional classroom, which may lead to passivity and a lower learning output if we do not recognise the change and facilitate for it.

Measures to compensate for the disappearance of body language are basic conditions for a successful use of virtual classrooms. In order to enhance the possibilities of interactivity among participants in a VCT session, conscious pedagogical choices are necessary to overcome the barrier of technology. It is also necessary to analyse the way technology influences both pedagogy and forms of organisation such as time and resource planning (Fjuk 1998).

Strengthening interactivity when using VCT

The virtual classroom technology brings in new perspectives on education, making the virtual classroom different from the traditional classroom situation. Although experiences from the physical classrooms can be transferred to the virtual classroom, special considerations must be observed to make the learning environment function. Synchronous e-learning may be considered a basic condition for furthering objectivist pedagogy (Benbunan-Fich 2002: 94). Still, it is important to exploit the pedagogical possibilities for interaction in practice so that the pedagogy develops in a more constructivist direction. A lack of focus on this goal strengthens the objectivist tendency, and the pedagogical choices take place somewhere between an objectivist and a constructivist learning-environment. In a physical classroom the experienced teacher will take signals from students and can choose to consider them if they are seen as important in the context. Even if this possibility is removed, it does not mean that students' expectations to be seen without having to show visual initiatives automatically disappear. Thus technology increases the need to make active choices about involving the participants, and it increases the need for participants to take individual initiatives and click on icons. VCT requires more focus on and awareness about pedagogical choices because the use of this technology may, unwittingly, lead to one-way communication and passivity. Thus, the degree of involvement is a pedagogical choice.

Students may contribute to planning on a long-term and short-term basis

Building closer cooperation between the tutor and the participants can be useful in order to break down mental barriers made by the technology. If students assume ownership of educational goals it may lead to more empowerment and responsibility, and they may perceive the contents as meaningful. Traditional roles are thus challenged, which may contribute to commitment and motivation. Students can be involved in a discussion of learning goals and in curriculum planning, as well as taking part in the fundamental discussion of VCT teaching and its goals, both the long-term aspects of the course and the individual lesson. The long-term aspects of the discussion could deal with the characteristics of VCT and the importance of active student participation. Such active participation may comprise planned presentations on special topics of interest and on experiences the students have made, the goals of the group work in breakout rooms, or the importance of preparing for the VCT teaching sessions. The short-term discussions could deal with priorities and with what emphasis should be given to exemplification. When storyboard is used systematically, a virtual classroom session can have a large degree of variation and activity, and passivity and one-way communication can be avoided.

Metadiscussions – continuous improvements of interactivity

VCT is a new experience for most people, teachers and students alike. Particular focus on the pedagogical aspects is needed to make VC teaching attractive and not just a poorer version of a physical classroom. The storyboard can be one solution: used as a permanent item on the agenda for discussions of what functioned well and what could have been done better, the storyboard makes it possible for everybody to contribute to continuous development of the virtual classroom. In a setting where a group has regular VC sessions, such metadiscussions may contribute to more participation and more commitment to making the sessions function well. Both the organisation and the implementation of VC will benefit from joint reflection at single loop as well as double loop level (Argyris 1992), and will develop from such participation, among other things through listening to fellow students and using association. This dynamic process is thus made part of the agenda and the concrete plans, the storyboard. Rules for collaboration are discussed openly (Krogstie 2005, Krogstie and Bygstad 2005), and the students influence the interaction, such as who should speak and for how long, whether it is allowed to interrupt, and so on.

Practice in working independently has to be part of the sessions to make student participation at VCT function, and a change in attitude on the part of the educator is a precondition. The ability to work independently can be trained by systematic discussions of goals, both general goals and personal goals and the relationship between them. Further, it can be trained by encouraging students to ask relevant and central questions, experience the importance of good preparations, discover the need for supplementary reading by searching the Web, and trust fellow students so that chatting is perceived as meaningful and not just a matter of form. With a continuous focus on mutual preparations the virtual classroom can be steadily improved.

Storyboard – a plan for the teaching session

Students may perceive the storyboard as something they are forced into, where everything is planned in advance and where there is no opening for the spontaneity of the real classroom. On the other hand, the storyboard can also be seen as a tool that through planning systematises and secures involvement and possibilities to act. Planning can include activity in breakout rooms, text chatting with clear goals, and slots for prepared presentations.

Breakout rooms – virtual group rooms

Through breakout rooms students are given opportunities for further contact and cooperation with fellow students. Preparation and planning are required to make this effective, and both students and teacher should collaborate to develop goals for the group work. A well-prepared case discussion can for instance start with a

few minutes of individual preparations and end up in a group proposal with three prioritised points that are presented to the class. Each group is given the opportunity of presenting their proposal in the classroom; the proposal is then discussed and a joint priority is reached. Small groups of 3 to 4 participants and short intervals are preferable.

Textchat – informal talks in the form of texts

Textchat can be seen as an important aspect of developing collaboration and a feeling of "we" among the students, and it can be a supplement to group work. There can be slots for it in the storyboard, for instance two minutes of brainstorming and reflection where students can ask questions and exchange views with their group mates.

Application sharing – files for student presentation

It is important to give the students opportunity to present their own material or conclusions from group work, and to do so to the whole class. This aspect can be important for variation in the teaching session and can significantly alter focus and thus relations in the process.

Web safari – using the Web for exploration and further reading

The Web can be used as an important source for exploration and further reading. All participants have access to the Web in the VCT sessions, and access is easier than in an ordinary classroom. However, despite technically good access, a precondition for functional use is good preparation. Such preparation can consist of finding and informing about suitable websites prior to sessions and making URLs available. Further, students can be encouraged to find good sites for further study, and they can be made responsible for finding suitable sites for various thematic discussions. Both the URLs and the goals and issues for further reading should be clearly communicated and made accessible on the website prior to sessions. It is a clear advantage that the students know the material before participating at sessions so that the teaching period can be used primarily for questions and discussions. There can be separate websites for further reading, examples, debates, different perspectives, or other experiences.

Blended learning – VCT combined with other forms of learning

In order to strengthen the constructivist aspect and enhance student participation, experiential learning, hands-on, problem-based learning, etc, it can be beneficial to combine VCT with other asynchronous e-learning technologies (Benbunan-Fich 2002). Thus, flexibility and efficiency are retained and at the same time it is possible to enhance the interactive methodology and let students take more control of their own learning.

Combination with Learning Management Systems (LMS)

The use of learning platforms such as Classfronter, which is a natural part of ordinary classroom teaching, can contribute to good preparations and continuous processes of collaboration. All materials are made accessible prior to sessions with suggestions and ideas, and feedback from the participants is expected. Lecture foils can also be made accessible and comments invited to what is unclear, when details should be added, or what should have priority.

Combination with asynchronous learning technology

Combining the synchronous classroom with an asynchronous solution for all the students can give individual facilitation that can be very useful for a lot of students. The students will receive feedback on their contributions, which will be an add-on to the joint classroom. Although this combination presupposes increased use of resources, it retains and strengthens flexibility.

Combination with group supported learning systems (GSS)

The synchronous virtual classroom can be combined with project-organised learning where students have a greater degree of control of their own group activities and are able to manage their own projects, facilitated by the tutor.

Combination with physical classroom teaching

The possibility of face-to-face contact from time to time can be useful for long courses. The flexibility of VCT is useful, but the technology can be even better with opportunities for personal contact. Knowing peoples' faces can make the virtual contact easier.

Variation and attention

Some of the reason for strengthening interactivity has to do with quite basic needs that are made evident when using the virtual classroom. This concerns the use of voice when body language is no longer available, and it particularly concerns variation during a VCT session.

Using the voice optimally – "radio voice"

Without body language the voice is the only medium. There is no "help" from body language to create or hold attention; there is no eye contact, no facial expression or gestures, no posture that shows openness or impassivity. Emotions that emphasise the content of the words have to be expressed through other media. The radio as a medium has had to develop its own type of voice – a "radio voice" – through decades. This includes building nuances and emotions into the voice, in addition to developing good and clear diction and a varied

intonation. When the listeners cannot be seen, it is easy to forget them and resort to a flat type of recitation (Driscoll 2001). This “radio voice” can be developed over time; however, it requires awareness and attention to do so. Also, it will be necessary for all participants, including the learners, to develop this kind of voice to make what they say worth listening to.

Variation enhances concentration

A considerable part of any teacher’s work is to ensure attention and commitment from the learners, and variation has been a necessary part of the classroom work. A lack of personal communication in the virtual classroom requires more concentration from the participants and they are easily bored (Raoanotti et al. 2002). In an ordinary classroom the participants, both the teacher and the students, can obtain and sustain mutual contact through body language, which can be used to direct and manage communication by the teacher as well as by the learners. When this element is not present, the demand for conscious participation from each participant is high if concentration is to be maintained. This also means that each lesson has to be quite varied; Driscoll (2001) for instance suggests using more foils than in an ordinary classroom and making each element shorter: ordinary lectures, applications, participant presentations, group chatting, video presentations, and so on.

Technological requirements

Bandwidth and long-term preparation

What are the requirements for technological accessibility? If a VCT curriculum is to be successful on a long-term basis, the technology has to function according to intention. There have been enough castles in the air concerning e-learning, due to insufficient resources on the technical side (Rapanotti et al. 2002). When technology does not function adequately motivation is lost, and all parties view the teaching sessions as a waste of time.

Preparations and training

Manuals and specifications for the machines have to be produced and made available to all participants. There has to be technical personnel to secure that the technical equipment and the Web function prior to sessions. Technical training has to be provided for the teachers and the students’ technical independence should be continuously trained as a precondition for implementing a VCT course. These can be demanding investments on the cost side.

Technical preparations for the session and helpdesk

Technical preparations are crucial and technical support has to be available both for teachers and students. It is necessary to maintain contact with each individual student to secure good access and available technical support during the VC

session, and this need will be greater at the beginning of the course than later when routines function. The tutor's task is to secure good learning output and s/he should not be required to give technical support. Ensuring the mentioned procedures can serve to avoid frustration and loss of students and to enhance the feeling of security and mastering, thus laying a good foundation for learning.

Conclusion – the potential of the virtual classroom

The purpose of this article is to discuss pedagogical aspects of using VCT. The following are the main conclusions of this discussion.

First, VC technology has great potential. It has the potential to make education flexible and efficient and at the same time sustain many of the benefits of the physical classroom. Additionally, VCT can be made very interactive by exploiting the pedagogical possibilities that are inherent in the technology, such as breakout rooms, video, text chat, application sharing, etc.

However, there are some clear preconditions for implementing interactivity, good student participation and cooperation:

- There has to be a focus on interactivity; otherwise there will be one-way communication;
- Preparations should be made together with the students; they should know what they can expect, not just technically, and they should also be aware of the demands as regards interactivity;
- There are requirements for academic preparation concerning both the teacher and the students;
- Continuous improvements of interactivity in the sessions have to be made to avoid one-way communication, and to avoid that the sessions are perceived as boring so that the students lose interest and motivation;
- Use of the technology has to be trained;
- There have to be high demands on technical functionality.

VCT used together with other learning technologies and learning platforms such as the ordinary classroom, asynchronous learning, webschool and video conferences – so-called blended learning – can give further possibilities for learning output. Blended learning could definitely become an important contribution to flexibility, cross-campus communication, and more contact between tutor and students than in the usual asynchronous e-learning technology.

Does VCT have the potential to replace the physical classroom? Conclusions from the mentioned experiments (Krogstie 2005, Føllmer and Fritsch 2005) show that neither teachers nor students were convinced that VCT was a good alternative to the traditional classroom. The present article attempts to discuss and highlight what conditions have to be present to make it a good alternative. For VCT to be perceived as a good alternative, both the teachers and the

administrators of virtual classrooms need to focus on pedagogical principles in order to reap the desired benefits from the technical opportunities. It is particularly important to involve students prior to a VCT course to make them well prepared for the new interactive student role, and to facilitate for continuous improvement of the methods. It is also important that the teachers focus on their own role – this may be one of the most difficult issues. And last but not least: resources must be allocated to make the technology robust.

References

Argyris, C. (2000). Organisatorisk læring - single og double loop. In Illeris, Knut (ed), *Tekster om læring*. Roskilde: Roskilde Universitetsforlag.

Benbunan-Fich, R. (2002). Improving Education and Training With IT. *Communication of the ACM*, Vol 45, No 6.

Driscoll, J-A. (2001). Designing and Delivering Live, Online Training, COLUMN: E-learning basics: essay. *ELearn*, Vol 2001, No 10.

Fjuk, A. (1998). *Computer Support for Distributed Collaborative Learning. Exploring a Complex Problem Area.* Doctoral thesis, University of Oslo, Dept of Informatics.

Föllmer H. and H. Fritsch. (2005). *Report on two virtual classroom course sessions at ZIFF / FhöV.* Local print, FernUniversität Hagen / FHöV Dortmund.

Illeris, K. (ed). (2000). *Tekster om læring.* Roskilde: Roskilde Universitetsforlag.

Jonassen, D. H. and S. M.Land (eds). (2000). *Theoretical Foundations of Learning Environments*. Mahwah: Lawrence Erlbaum Associates.

Keegan, D. (2000). *Distant training. Taking stock at time of change*. NY: Routledge Falmer.

Krogstie, B. R (2004). *Knowledge and use of VCT in the Scandinavian countries*. Local print, NITH.

Krogstie, B. R.(2005). *Report on two virtual classroom course sessions at NITH*. Local print, NITH.

Krogstie, B. R. and B. Bygstad. (2005). *Introducing a Virtual Classroom in a Master Course: Lessons Learned.* Paper given at the EISTA 2005 conference.

Lahn, L. (1998). Tacit knowledge and the computerization of Professional Work. In Knut Holtan Sørensen (ed), *The Spectre of Participation. Technology and Work in a Welfare State*. Oslo: Universitetsforlaget.

Lahn, L. (2004). Dilemmaer i udviklingen af e-læring på arbejdspladsen. In A.M. Kanstrup (ed), *E-læring på arbejde*. Roskilde: Roskilde Universitetsforlag and Learning Lab Denmark.

Melling-Olsen, S. (1990). *Kunnskapsformidling, Virksomhetsteoretiske perspektiver*. Rådal: Caspar Forlag.

Paulsen, M. F. (2001). *Nettbasert utdanning. Erfaringer og visjoner*. Oslo: NKI Forlaget.

Rapanotti, L., C. T. Blake and R. Griffits. (2002). *eTutorials with voice Groupeware: real-timeconferencing to support computing students at distanc*e. Paper given at the ITiCE'02 conference, Aarhus.

Strømnes, Å. L. (1993). *Kunnskapssyn og pedagogikk*. Trondheim: Tapir.

Svensson, L., G. Brulin and P-E Ellstrøm. (2002). Innovasjon og lärprosesser i den nya ekonomin. In Svensson, Brulin, Ellström, Widgren (eds), *Interaktiv forskning - för utveckling av teori og praktik*. Stockholm: Arbetslivsinstitutet.

Chapter 3

Session set-up

Helmut Fritsch

Session setup as educational scenario

"Quomodo quid tradere conveniat", is a short item on the "to do list" for didactics meaning the specific way, **how to best convey content** to pupils: fomulated in 1652 by the Duisburg schoolmaster Johannes Clauberg in his book *Logica Vetus & Nova* in the second part[1].

When I first read this concept, again introduced into our dicussions by the Italian scholar Benedetto Vertecchi from Rome in his ZIFF Papiere 109 [2] (Hagen, Juli 1998), I was reminded of early communication analysis literature (Harold Laswell,1948)[3] and the string "who says what, in which channel, to whom, with what effect?". Certainly, educational scenarios are a sub-kind of communicative scenarios.

"Quomodo quid tradere conveniat" is a didactical concept like "which medium for what?" It is on a meta level thinking about the teaching process and its use.
So when we present scenarios of teaching situations we acknowledge that we do our teaching in the hope that learning may happen: we neither will be able to, in every case, really prove that it has happened nor that it has happened because of our teaching intervention. So the term "educational scenario" is a second-best term for what we are researching. The good thing about it is, that we may start at today's reality, the situations learners are in, in today's society (with today's constraints) and today's possibilities!

I want to introduce the concept of an "educational scenario" as a didactical roadmap to the effect of learning and in this roadmap a session is like a defined stretch of road and the session setup like a drive-up to the motorway.
But beware: another idea from psychology and communication is the Gregory Bateson formula "the map is not the landscape"!

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[3] [1] 2nd edition of 1704

[2] http://www.fernuni-hagen.de/ZIFF/ZP_109.pdf

[3] Harold Lasswell (1948). "The Structure and Function of Communication in Society." In Lyman Bryson (ed.), *The Communication of Ideas*. Harper and Row.

Instruction in a school also needs planning of premises, addresses, rooms, toilets, heating, windows, cleaning, and someone who is in charge. Mostly there are pupils known to each other and expected by the teacher. Newcomers will be introduced and given advice how to behave. And there will be rules to follow which may be very different from room to room, from teacher to teacher, from school to school. And we all know that there also is a "hidden curriculum" which I mention before the official curriculum for which teachers are paid for to follow and for which society has installed the institution. So at least we now can imagine the many different dimensions of setup for normal instruction.

Setup

The main difference between a setup for e-learning and a virtual classroom is the necessity to have a fixed time frame when participants and teacher/tutor are to be online. So it seems that one of the major advantages of e-learning or distance education, as has been discussed in the literature (time independence or, as Holmberg puts it "non-contiguous teaching and learning"), has to be given up.

In e-learning communication takes place via different channels- but here we are talking about the procedures to set up communication which precede the course-related communication, the specific level of communication which enables the taking place of online course-communication.

Schedule

A session will be scheduled, either as a single event or as a regular course- which we can neglect as far as the repetition of a first setup is concerned; many steps need not be carried out again and again for the second and/or third event in a row. The main information of such a schedule is the exact time and time-zone in case more than one given time-zone is concerned and the time-span to be scheduled.

Prerequisites

A session can only take place when certain system prerequisites are given and tested. When we consider that the individual configuration of "students" may be rather different according to what level a student already has, whether such prerequisites can be assumed to be known or not, it will be a chapter on getting prepared to participate in a virtual classroom. The easiest form of preparation is to go somewhere, where someone else has tested the equipment and to concentrate on the soft skills you will use when participating. So given that standard hardware is installed and running only deviances from the standard will have to be respected.

Hardware

Two basic forms can be discerned here:

1) A system as a stand-alone system of communication where you can install only few items:
We have tested such a system (Workpackage 4/5 of this project :*Holger Foellmer & Helmut Fritsch, Hagen 2005*) and it is not yet used widely; although similar systems occurred already five years ago, when we researched different platforms for distance education and e-learning: (the Leonardo project "Web-edu") there we came across a system engaging satellite TV-decoder and connected with a chatroom via PC every morning, serving a couple of hundred students for further education.
The system we researched this year was a hardware box not looking like a PC, having only two or three buttons- no keyboard- no mouse, but a headset and loudspeaker to plug in (and inside a powerful Windows XP PC which they even didn't know)
One might ask why such a restricted system, which you really cannot use for any other purpose but the course you are enrolled for and which will be delivered to the student for just that purpose. The reason for such a restricted system is to reduce uncertainty on the side of the student. Students are different from each other and there are many who refrain from PCs because of their uncertainty in coping with all the necessary "instal this and download that" orders, all the "setup" functions. Anxiety of system breakdowns, of viruses or simple errors where students might be ashamed to talk about or ask for help

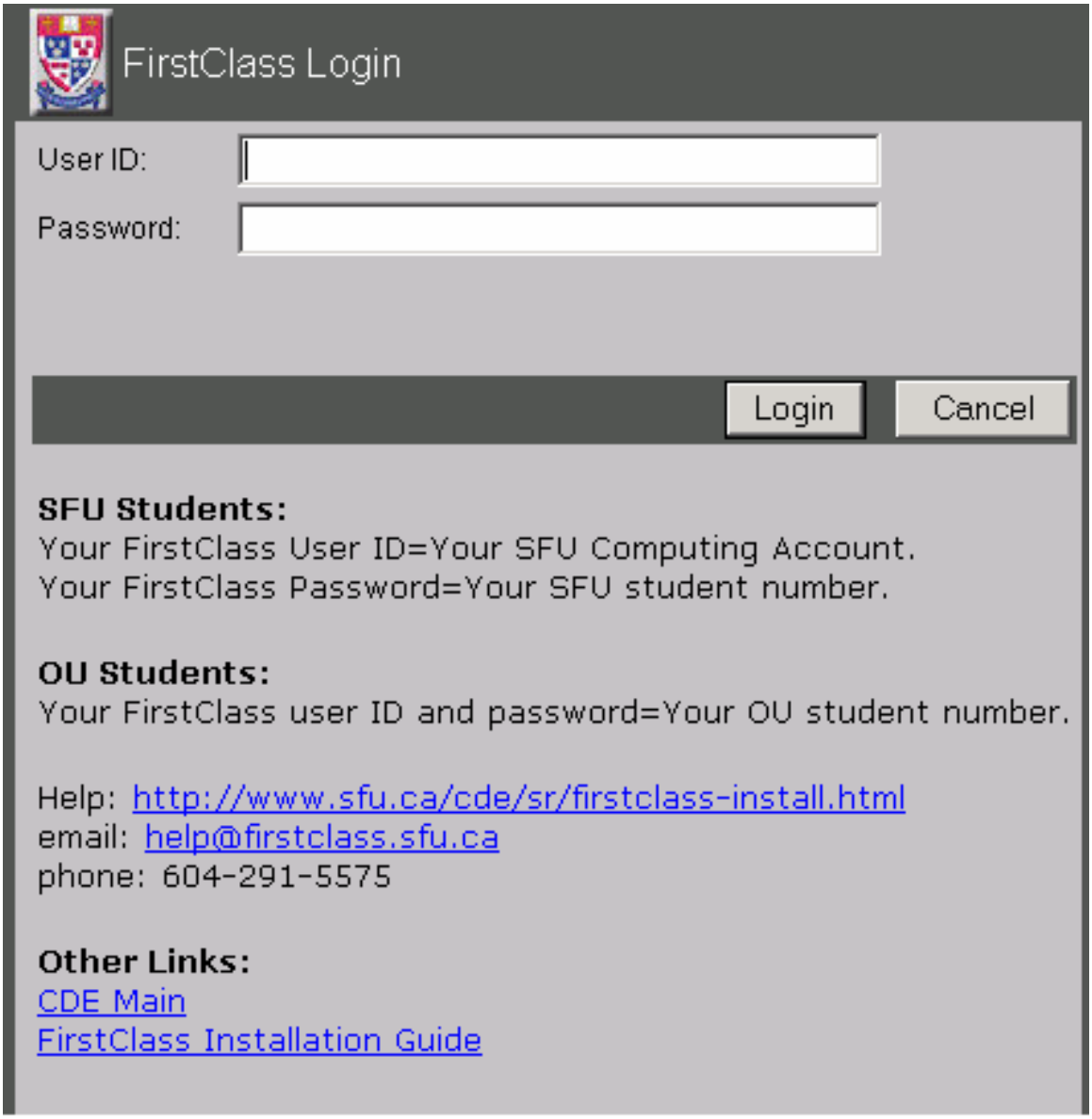
Details of setting up session	**Micro video stream text chat**	**Schedu ling**	**Enrolling**	**Notifying participants**	**Access privi ledges**	**Storyboard for teacher preparation**
Four systems in one room installed by someone else	One to one Restricted possibilities: ppt's overlay	Fixed	Pre-enrolled	Fixed time	Teacher only	Storyboard has been developed during Sept-Dec. 2004

This setup we would call a totally restricted, secure error proof system setup.

2) The standard computer system makes use of many elements which came along with your computer and had been sold as "plug and play" (provided you have installed the basic communication tools correctly) like in the Microsoft Windows XP system today.

"Plug and Play" is one of the tricks to sell add-ons to the standard computer equipment. But your computer should have the sockets for such additional gadgets. It hasn't been for long that institutions clearly announced what you really need as a minimum to log on to an offer the institution was proud to have. Hardware minima and software standards are put on a list and distributed to the students. Let us look for examples:

Example 1: First Class:



(The following three examples are taken from SFU: http://www.sfu.ca/cde/index.html on May / June 2005.)

FirstClass Computer Requirements

This course requires active online participation in FirstClass (an online computer conferencing tool). On-campus computer facilities are available. If you are using your own computer, these are the minimum computer requirements:

Hardware

PC with Windows 95 or later OR Macintosh with System 8.6 or later
10 MB RAM
6 MB free disk space
28.8 baud modem (56 K or higher is recommended)
CD-ROM drive

Software and Other
Internet connection
FirstClass software (provided in your course materials package)
E-mail (e.g., Eudora, Outlook Express, or equivalent)

FirstClass Access and Accounts
Access to FirstClass begins on the first day of classes.
SFU students: Use your SFU computing account ID and your SFU student # to log into FirstClass. If you don't have an SFU computing ID, get it online at http://my.sfu.ca.
OU students: Your FirstClass ID and password is your OU student number.

Connecting to the Internet from home
You are responsible for setting up your connection, either through SFU or your own external Internet service provider (ISP) (e.g., Telus, Shaw, etc).
For information on Internet service available through SFU, please consult Academic Computing Services (ACS).
The subsidized modem hours allotted to you (four hours of access per credit hour) may not be sufficient to complete the required course work.
A voucher system has been implemented to allow students to pay for continued modem access on 604-677-6678 (after your subsidized access is used up). Vouchers may be purchased from campus bookstores in increments of $20. At 60 cents per hour, each voucher is good for approximately 33 hours. Instructions are included with the voucher. For information, please see http://www.sfu.ca/acs/modems/index.htm.

General
Prior computer knowledge is expected (i.e., ability to save files, install programs, and maintain your computer). Familiarity with the Internet, e-mail, and related applications is highly recommended.
Support is not available for general computer problems (e.g., operating system, hardware).

2nd example: WebCT

WebCT Computer Requirements
This course requires active online participation in WebCT (a web-based course management system). On-campus computer facilities are available. If you are using your own computer, these are the minimum computer requirements:

Hardware
PC with Windows 95, 98, 2000, NT, XP, or ME OR Macintosh with System 8x or later
64 MB RAM
28.8-baud modem (56 K or higher is recommended)
CD-ROM Drive/Sound Card.
Software and Other

Internet connection
E-mail (e.g,. Eudora, Outlook Express, or equivalent)
Web browser that supports tables, frames, Java, and Javascript; Netscape version 4.5 or higher (but NOT version 6), or Internet Explorer version 5.0 or higher are recommended

WebCT Access and Accounts
Access to WebCT begins during the first week of classes.
All students: To access your online course, go to http://www.webct.sfu.ca and log in with your WebCT ID and password.
SFU students: Use your SFU computing account ID and password to log into WebCT. If you don't have an SFU computing ID, get it online at http://my.sfu.ca.

OU students: Your WebCT ID consists of the letters “ou” followed by your first and last names. Letters should be all together, in lower case, with no spaces in between (e.g., John Doe’s ID would be oujohndoe). Your password is your OU student number.

Connecting to the Internet from Home

You are responsible for setting up your connection, either through SFU or your own external Internet service provider (ISP). (e.g., Telus, Shaw, etc.)
For information on Internet service available through SFU, please consult Academic Computing Services (ACS).
The subsidized modem hours allotted to you (four hours of access per credit hour) may not be sufficient to complete the required course work.
A voucher system has been implemented to allow you to pay for continued modem access on 604-677-6678 (after your subsidized access is used up). Vouchers may be purchased from campus bookstores in increments of $20. At 60 cents per hour, each voucher is good for approximately 33 hours. Instructions are included with the voucher. For information, please see http://www.sfu.ca/acs/modems/index.htm.

General

Prior computer knowledge is expected (i.e., ability to save files, install programs, and maintain your computer). Familiarity with the Internet, e-mail, and related applications is strongly recommended.
Support is not available for general computer problems (e.g., operating system, hardware).

Need Help?

General inquiries: CODE technical support at help@firstclass.sfu.ca or 604-291-5575.
WebCT FAQs for students: http://webct.sfu.ca.
Help with your SFU computing account: help@sfu.ca, 604-291-3230, or visit AQ 3148 on the Burnaby campus."

3rd example: eLive

eLive enables synchronous audio communications over an Internet connection. Use it for Office hours, tutorials or lectures for distance courses. Meetings or brainstorming sessions for geographically dispersed persons

Users can: Speak one at a time; Use text messenging; Use Whiteboard for drawing or importing images; Import or view PowerPoint presentations; Share applications such as Excel, Word or others

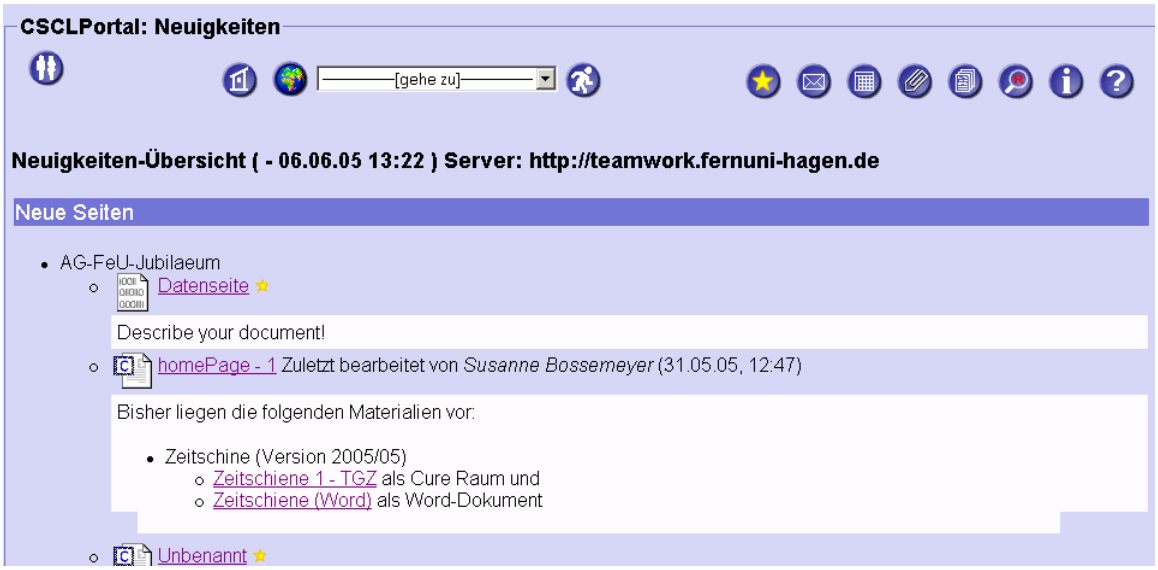
Setting it up
Maximum of 25 simultaneous users
Use eLive from your home, office, or while travelling

Things to know
Plan ahead and use your time well
Test computers and microphones ahead of time
Speak clearly and with animation

Five Minute Introduction
This eLive recording will introduce you to the basic eLive functions.
(You will need the eLive software to view the recording, available at the Elluminate Support Page).

4th example : Cure

CURE - The Collaborative Universal Remote Education Environment for Learning and Working together. Here is an example where you can see how many different icons there are to be learned - it is not just your system name and password- there is a lot more to become active in a virtual surrounding!



What is CURE?
CURE is a non-commercial tool that facilitates collaborative learning in distributed teams using standard browsers over the Internet. CURE was developed at the FernUniversität in Hagen, the German distance learning university. CURE is based on combining the room metaphor, WIKI ideas, and communication tools.

Who should use CURE?
Anybody interested in working and learning with others over the Internet. Current users include mostly students enrolled in courses, seminars, labs, and project work – and, of course, their teachers and project leaders.

What functionality does CURE provide?
Users can create rooms for specific groups and purposes. The owner of a room defines its initial content. The room owner can make the room accessible to a number of users, or users may request access from room owners. Room owners can restrict access rights.

A room contains pages, resources and communication tools, which are created, manipulated, navigated and read by users of the room. A simple WIKI syntax is used to write the content of pages including formatted text, images, and TEX for expressing mathematical formulas. Changing a page results in a new version – thus, multiple parallel write accesses result in alternative versions that can be merged later. Rooms can be connected, thus, dedicated environments with special rooms for specific purposes can be constructed. Easy navigation in the so constructed virtual environment is supported via maps. E.g., our university offers course rooms that are connected to further course-specific rooms, which contain dedicated materials or are designed to support specific teams.

Users can add/remove/view resources associated with the room (e.g. to open a binary file, or to start a binary tool). Users have their personal home page providing options for personalizing CURE. They can for instance subscribe to change notifications of rooms that can be delivered via e-mail. Each room may have its own chat and room mailbox that are kept persistent. All users in a room can simply chat with all other online users in that room, or view and send mails to the discussion threads in the room's mailbox. Chat and mail messages can use the WIKI syntax, and thus may be used to communicate mathematical formulas etc.

Rooms can also contain a room calendar, which supports negotiation of meeting dates and times between room users. For a detailed list of the features of CURE's current version, see the user manual at http://cure.pi6.fernuni-hagen.de, which will be available in English shortly.

What are the benefits of CURE?
Simple setting-up and use of a persistent collaboration environment for your team. Access from any web browser. Instant communication and asynchronous sharing of material.

What are our experiences with CURE?
CURE is successfully used in 4 courses in the winter term 2003/ 2004 in the schools for psychology (seminar), for mathematics (course on linear algebra), and for computer science (course on distributed systems, project-based class in CSCW). Currently, more than 300 users use CURE, and the user base is growing.

How can you use CURE?
Go to http://cure.pi6.fernuni-hagen.de and register as a new user. After receiving the access code by e-mail, you can start using our free public CURE server to build rooms, share them with others, and to get an idea of what other users are doing (provided that they let you into their rooms). Note: The free public CURE server offers the same services as our internal CURE server used by our students.

CURE is an emerging research system. Thus, we do not guarantee any availability or persistence of your data – although we make every effort of keeping CURE up and running. More information can be found when signing up for CURE.

Awards for best sessions

Now to get an idea of the scope of life online events there has been an award with quite a lot of submissions from all over the world in different formats with many categories listed there.
http://www.thelolas.com/winners.html#awards

Interestingly enough we find in the award winning procedures a line that says you should not turn in more than half an hour of online documentation or indicate the exact minutes from where to where when turning a product in. So the discussion in the standardization scenery about granularity seems to not at all be relevant for the praxis of life online learning. Back to our search for the session setup category- it should precede any of the sessions learners want to take part in. Any format you can think of and describe will be possible to develop or even buy right now from the shelves.

Different angles

The preparation of the person in charge of a session is different from the preparation of ordinary participants. One of the main problems with session setup needs to be discussed here and it sure belongs to the responsibility of a presenter to clear that specific situation, to reserve enough time to re-catch the participant unless you dont care about **technical drop-outs**.

Nowadays people who make use of the internet have so many usernames and passwords that it seems difficult to memorize so many. So students tend to use the same password all over - they change the assigned password to the one they are used to. To be able to do this is standard procedure. But also to forget the username and the password is standard.
So wherever you look, statistics of participants are always about the number of people having logged in at one time; the difficult question is whether the participants original username will be cancelled when having received a second or third one. This seems to be the reason why webblogs have such a hard time to flood into the internet user community: the necessary ùsername/password which has been given and forgotten, given again and forgotten again makes me refrain from many websites where the most interesting things might happen in the password-protected area. The fear of becoming a victim of "phishing" of passwords is only one of the reasons, why students are reluctant of logging into websheres.

Participant session setup

In order to meet, participants need to have computer equipment installed, a modem or some other connection to the internet installed, have an account by which they can be identified, paid their bill, have AC current, be awake etc.

1) go online, i.e. have a standard web-browser open
2) know the address where to meet and where to put it
3) have permission to log in
4) have a password ready and valid
5) know the rules

Mostly there are some extras in such a computer surrounding, like microphones, loudspeaker and in some cases cameras. These extras need to be installed correctly and then "calibrated". Audio channel and video channel have many dimensions you may choose from: So you will have to tell the system what type of audio you prefer (unless you don't care and try with the pre-installed

coponents): e.g. Soundblaster PCI, 44100 Hz 16bit stereo, at the rate of 176Kb/s then you choose the type of compression, e.g. MPEG layer3, for still pictures from your web-camera you might choose the JPEG file interchange format (or the Windows bitmap format?) at this point you can move an arrow towards high resolution or lower resolution, depending on the compression rate of the data you want to transmit.

Also with the video offer you may choose from different formats, qualities, compression rates etc. as you wish: if it is colour you have additional possibilities to change - so you are bound to try out, experiment with your own equipment - the best is to find someone using similar equipment and then try out the results together until you are accustomed to your own equipment. It will take more than a couple of minutes to test all and get acquainted with it. In some cases you will have to adapt your choices - even during the session - in order to prevent feedback loops or the like.

Then you will have to get acquainted with the conference software, the looks and feel of the system. Before you speak you will find that a virtual microphone is passed on to you so that others can listen. In some cases you virtually can clap your hands, raise your hand, choose small icons representing actions you are accustomed to from your early school days. And you can leave the virtual room with or without telling the others. So you will feel to be in control. But you are not. Because raising your hand is one thing, whether the person in charge will pass the microphone on to you is another question.

In some cases you have several pictures alongside the main window, where the class meets, where you can see other participants- the number of such windows will be restricted to very few because it does not make sense to really watch the reactions of different people to what is being said instead of watching one who is speaking at the moment.

So be aware that a good presenter will call upon you at different times and you are supposed to instantly react, otherwise your name is called several times which leads to the same feeling as it used to be in the classroom long ago (when you went asleep). So in the Centra system, during such an audio conference meeting, the sound of the presenter still is in my ears, when he asked in the tone and speed of an auction at Sothebys to give him a "green tickmark", indicating consent.

There are not many options to behave in such a virtual classroom, but there are some basic ones you would want to get used to before the session where you might be "graded" starts.

Presenter session set-up

Like an art director it is necessary to have a vision of what is going to "happen" in a session and what the results will be. You will need a "**storyboard**". Like a classic teacher in class you will learn to rely on some of the participants when planning the event because you already know them. All soft skills of a good teacher will be needed to make participants become active, to give them the feeling that it has been worth their time to participate.

And after such a session there still is the possibility to "rewind" the event, to analyse and learn. At least this aspect, the possible documentation of such a session, seems to be worth all the effort for the sake of becoming a better teacher.

Chapter 4

Content design

Gearóid Kenny

Introduction

This chapter is intended to provide readers with some key points regarding the deployment of synchronous virtual classroom sessions within their organisation. However we are also aware that there is a lot of ground work that must be completed before a session can be deemed ready for deployment towards end students. For that reason we have taken some backward steps when writing this chapter to focus on issues such as:

- The factors to consider when deciding whether to use synchronous learning methods or alternatives such as traditional classroom based learning, asynchronous learning etc.
- Relevant guidelines that should be considered before developing any content. This section contains a number of general observations on how to approach the task of developing content so as to ensure that no serious oversights occur.
- Guidelines for promoting interactivity within sessions – in the case of both synchronous and asynchronous learning events the success of a course / module will usually depend on how much interaction occurs between the students and their teacher, because of this fact we have included specific guidelines on how to create opportunities for interaction in synchronous virtual classroom events.
- The various methods and systems that can be used to facilitate rapid content development. It is largely recognised that synchronous learning methods are gaining popularity due to the fact that they can be produced at a cheaper cost than alternatives asynchronous distance learning methods. In this section we look at some techniques for rapid content development – using these techniques can ensure that development costs are kept as low as possible.

Deploying Live eLearning

When approaching the task of delivering material to an audience there are a variety of methods that can be used to perform the delivery these include traditional classroom based learning, asynchronous learning methods and of course synchronous learning methods.

In this section we detail some of the principal reasons why an organisation would choose to deliver the material using synchronous methods. Our experience has shown us that the deployment of synchronous eLearning typically begins in small groups or departments within an organization and spreads outward from there to other groups within the organisation, as a result of the championing of the cause by those in the initial deployment group.

While this list below is comprehensive we don't anticipate that every possible reason / scenario will be detailed within this list. Of course in reality the final reason for choosing to deploy synchronous virtual eLearning methods will be a combination of the reasons listed below.

For convenience the various different reasons have been listed according to three criteria:

- Those relating to the audience
- Those relating to the material
- Those relating to teaching resources and materials

Those relating to the audience

Often it is too expensive to bring the target audience together in a single physical location for the purposes of training / education. This is one of the most common reasons for choosing to deliver material via synchronous virtual classroom methods. In reality it is probably most applicable to corporate organisations, where concerns regarding costs and profitability are usually quite high.

Another reason often cited for the deployment of synchronous eLearning courses is that it is very difficult to get audience members away from their jobs for a scheduled training activity. Again this typical large corporate organisations, but is also relevant in the case of academic groups etc.
In such groups the reality is that due to day to day working / managerial commitments personnel (typically those at senior level) are unable to be away from their work for an extended period of time and so those organizing training opt for a synchronous delivery option, as it not only saves them money but also saves them the time associated with travel, accommodation and the opportunity cost of being away from their work for a prolonged period of time.

A final reason that has been identified as being relevant to this discussion it that the target audience are likely to prefer to learn through being a member of a larger group of people as this allows them to learn from both the material presented and from the opinions and actions of fellow students. If this is one of the reasons for choosing to use synchronous learning methods then specific consideration needs to be given to including opportunities for dialogue and interaction in order to ensure that this benefit is realized.

Those relating to the content

There are certain types of content that lend themselves to deployment via synchronous learning methods. *Generally* speaking the most suitable content for delivery via virtual classroom methods is material that is very structured or factual such as technical, mathematical or scientific information etc. Such material generally lends itself to minimal questions and interjection from audience members when it comes to drawing conclusions and results.

Sometimes however it may prove attractive to use synchronous learning methods when the content requires some limited discussion and or group work in order to be completed satisfactorily. When this is the case it would not be possible to use asynchronous delivery methods so that the organiser is left with an option to organise a physical or virtual synchronous event. When deciding between these two methods factors such as cost, the level of interaction required and available time will combine to allow for the decision to be made.

Those relating to the availability of teaching resources and materials

For any institution, whether academic or commercial one of the biggest issues they face in deciding on the method to be used to run a session is the availability of resources i.e. teachers, classrooms etc.

Our experience has shown us that where cost reduction is an issue synchronous learning methods prove more attractive than asynchronous methods due to the fact that they can be produced more quickly and by people with a lower level of expertise than asynchronous methods, where the levels of expertise required to produce the material are high due to the use of more complex development technologies.

Having established some of the primary factors to be considered when deciding whether to produce synchronous content we now turn our attention to some of the issues faced by a the instructor / course developer once the decision has been made to proceed with synchronous delivery methods

Designing a Session

There are some key questions to consider before beginning to design and develop content for a specific synchronous virtual classroom session. This section examines these questions in detail and suggests some potential solutions to them.

Begin with the end in mind ie focus on the overall objective for the session / entire flow. Regardless of the method used to deliver your course material i.e. whether it is synchronous, asynchronous or involves the use of traditional classroom methodologies an instructor has always to focus on the overall goal of the session flow and then develop material to meet these objectives and sub objectives.

In the synchronous virtual world this requirement is more difficult to realize because the instructor has to preempt the audiences needs more accurately and create the necessary material to meet these objectives in advance of the session.

While the instructor in a traditional classroom scenario has to preempt the students needs and design the material accordingly, students will be more forgiving if the instructor needs to take a small recess to fish out additional material. In the synchronous virtual world these small breaks result in a long silence at the instructors end and may lead the students to believe that there is some technical problem on the system and / or it may cause them to lose interest in the session material which may never be reclaimed.

Consider the audience for the session. In relation to the audience, the main factor that needs to considered when designing the session content is the prerequisite knowledge required by the audience before entering the session. However the course / content designer may be very limited by his restricted knowledge of the audience and their knowledge levels.

However, regardless of background audience knowledge it is recommended that the participants be given a written course description / course outline detailing exactly what will be covered / omitted during the session and what knowledge the students are expected to have. This allows the students to gain any necessary knowledge so as to “plug” any gaps prior to entering the session.

Another benefit of creating the course outline / course description is that it should clearly state the objectives for the session in a logical order and so can act as a roadmap for developing the content.

The above are general considerations to be followed when developing synchronous content, the information below is intended to act as more “hard-line” rules that must be followed when developing session content.

- Divide your session into modules of no more than 90 minutes in duration. If the module details particularly complex information then consideration should be given to reducing the duration to less than ninety minutes. This is because student concentration in a virtual environment tends to fade much quicker than in a physical classroom.
- The module must include as much interactivity as possible – within the virtual classroom environment there are a variety of methods that can be used to present information including PowerPoint, application sharing, the usage of internet content, quizzes etc. The activities must change frequently during the session in order to promote student interest and learning.
  Research has shown that **i**nteractive sessions because of their inherent dynamism hold a participant's interest for longer and increase their levels of information retention.
- When the Centra organisation conducted a recent survey amongst participants on what makes a learning experience effective, the most commonly received responses were as follows: (note the order here is not representative of the popularity of the participant responses):
  - the instructor involved the participants throughout the course
  - the participants were able to apply what they learned immediately to their job
  - the instructor used a variety of instructional methods;
  - the participants were given lots of opportunity to do hands on exercises

Promoting interactivity within sessions

While the guidelines detailed above are very relevant they are not sufficient for an instructor new to deliveries using synchronous techniques. Below are some specific ideas for creating interactivity opportunities when developing content. The list concentrates on this aspect of deliveries on the grounds that the success of most sessions will depend on the level of interactivity included in the session.

- turn bulleted lists eg lists detailing the features or characteristics of a product service etc. into a series of true or false questions to be answered by students
- replace keywords with blanks in the student guide so that the participants write the keywords into their guides as you present. The participants should then be questioned in random sequence regarding the correct answer
- use an online evaluation to question the participants on their understanding of a topic and on their feedback on the material presented
- Get the participants to do the summary of the key points of the presentation ie rather than the teacher doing the wrap up ask the participants to paraphrase the key points from the lecture

- Get the participants to diagram using the whiteboard what was taught during the session
- Where the material is suitable present a problem to the participants and then give everyone a moment to think about the problem. Next pick a volunteer and have him/her try to solve the problem. If possible encouraging the participants to think out loud about the problem and where appropriate allow coaching from other participants regarding the potential solution.
- Explicit notes should be developed for the session leader, to illustrate for him how a particular subject should be taught – these should include the questions the leader should ask etc.

In a traditional classroom instructors often abandon the instructor guide in favor of their own agenda or instructional techniques and style. In the synchronous environment the session leaders tend to teach using the material created within the agenda builder, it is more likely they will follow the design of the course. However despite this they still need to be given instructions on how to bring the material to life, how to place the material in it's correct context and how to build participant questioning into the agenda, thereby encouraging the leader to check for comprehension and so increase participation and interactivity.

- When participants have to follow the material using printed student handouts page numbers must be assigned to the slides. This will ensure that the students do not become lost trying to follow the course material and so can spend more time interacting with their instructor and peer students.

- If the material is to be delivered over a variety of modules exercises or homework should be assigned for completion by the students between the modules – this has the effect of reinforcing the content and / or preparing the participants for the next session. This will help to ensure that the participants are more confident in relation to the discussions that take place at each class and so should be more willing to participate. When doing this it is necessary to bear in mind that the instructions for completing these exercises must be more explicit than for classroom-oriented material because the leader often isn't available to answer questions.

Methods for rapid content development

One of the principal reasons for using synchronous classroom based learning methods is that relative to asynchronous learning methods they are far cheaper to produce per module. This section focuses on the techniques that can be

deployed in order to develop modules / sessions as easily and quickly as possible.

Problem-Based Learning

Developers can cut down material development time and increase learner interaction by creating problem-based courses. Problem-based learning presents the content in the context of problems that must be solved by the participants as individuals or teams.

The first step to developing such material is to identify suitable course related problems and the skills needed to solve them. The course must then be structured around solving these problems. The following is a six-step process for running problem-based learning modules:

- form teams, appoint a team leader to the team and then assign a problem to them
- give the team an appropriate amount of time to examine the problem and steps required to solve the problem.
- get the team leader to distribute pieces of problem-solving process to the various team members.
- each member gathers what is needed to complete his/her part.
- after an agreed amount of time the team members regroup and share the information regarding the solution amongst themselves.
- the teams use the information gathered from each member to develop a solution and share that solution amongst the other participants.

Use a Subject Matter Expert

Using subject matter experts (SMEs) can greatly reduce time spend doing research. There are many ways to incorporate the contributions of an SME into a session for example:

- record, with a video, the SME solving typical problems that are anticipated to occur - small, edited portions of the video can then be used as online content.
- hold focus groups with SMEs to review learning material already developed - the focus group scenario allows the SMEs to reconcile differences of opinion regarding the content and provide general feedback on it.
- offer the course with skeleton content and let the SME teach using that skeleton content as a guide to what should be taught. During the SME's presentation capture (using note taking) the content, stories and questions discussed during the class. This information can then be used to structure the course of the final developed course. If appropriate allow the SME to assist in the next class to answer questions and solve problems that did not come up in the first class.

Record Questions

New content developers tend to focus on course information. Experienced content developers focus on the questions that arise during the course. Build content around these questions. For example:

- questions the developer asks while learning.
- questions other trainers asked when teaching the content.
- questions asked rhetorically by SMEs.
- questions asked by learners or questions anticipated from learners.

Use the questions to:

- create a frequently asked questions (FAQ) job aid.
- introduce the topic with the questions to stimulate curiosity.
- create scenarios and cases for learners to complete and discover the answers.
- build online evaluations and final assessments or certification exams.

Use Existing Materials

Instead of creating all the materials for a course “from scratch”, use existing material where appropriate. Using existing material can involve incorporating the material into the agenda or directing learners to study in their spare time:

- tutorials
- white papers
- learning and knowledge objects
- recorded sessions
- books and manuals

Build Structures

Build class structures without content. Let the learner fill in the content. For example; incomplete worksheets, incomplete diagrams, incomplete models, incomplete flowcharts etc.

Adapting existing content

Content created for one delivery method may require work to adapt it for use with another delivery method. This is especially true with content that has been designed and created for asynchronous web-based training or computer based training. It is possible to adapt this content for delivery with another method, but it takes a lot of work.

Content developed for the physical classroom can be adapted easily for live eLearning. The solution lies in the basic design principles applied to creating a

learning program. The content created from design sessions should be patterned for use and reuse with different delivery methods from the very beginning.

There are, several special considerations when adapting existing asynchronous or traditional classroom content for use in a synchronous learning environment. Generally speaking the easiest courses to adapt to online instructions are those that have the following characteristics:

- they are modular in their nature
- they are slide-driven, in which each learning point has a slide associated with it
- existing slides are not graphically complex and use as few words as possible to
  summarize the major points
- the instructor guide for classroom training includes objectives at every level and
  includes instructor lead-in statements
- the existing instructor guide includes questions to ask participants during the presentation to ensure comprehension and encourage participation. It should ideally also include evaluation questions at the end of each module

Before adapting material for synchronous online delivery, sit in on the classroom delivery of a course to see how the class is conducted, what instructional techniques are employed and what materials are used to support content delivery.

Adaptation Process

The follow process can be used when adapting existing content for use in the synchronous learning environment. While it is not necessary to follow all the steps in the process the following guidelines are useful when adapting content for use in the synchronous learning environment.

- look at the structure of the course to determine how the content maps to the objectives.
- modularize the content into sessions of no more than 90 minutes duration.
- develop a course outline or description for each module.
- identify activities to be used during and between sessions.
- determine which online instructional tool that is most appropriate for the content, the tool chosen should be the one that encourages maximum participation and understanding.
- look at the media used in the current session and decide whether it must be
- converted to another format or recreated so that it can be used in the synchronous environment.

Design to Delivery of synchronous events

The steps below provide a summary of the issues discussed during this chapter as it provides summary guidelines on the processes for designing, developing and delivering content, as well as revising a synchronous learning event. This guide is intended for presenters, content designers and event managers.

1. Design the session
Identify objectives, audience, and outline for the session. Decide on the best way to get each point across, keeping in mind the various instructional tools available. Design for participant interaction and change activities frequently.

2. Create the content
Use tools you are comfortable with to create the content. The most commonly used files in a synchronous event include PowerPoint presentations, .gif or .jpg images, audio or video files, and HTML. Other types of content to create might include job aids, a student guide, and leader notes.

3. Assemble the content
Most synchronous applications include a module / function to allow different forms of content to be assembled in a single location so that it can be incorporated into a synchronous learning event, in one step eg the agenda builder application within Centra. Once the content is available for use it should be loaded into the content assembly application so that it can be included in the event.

4. Setup the event
Once an agreement has been reached with the participants regarding a time and date for the delivery the virtual event must be set up on the synchronous application. The leader and students must then be registered as part of the session. Finally it is necessary to add content to the event

5. Deliver the event
At the scheduled time, the leader and participants should meet online to conduct the session using the content developed.

6. Monitor and revise
After the event it may be necessary to modify the content on the basis of the feedback received from the participants so as to improve any subsequent deliveries of the material.

Chapter 5

Leading an event

Gábor Kismihók

Introduction

Leading an event in a Virtual Classroom is not a daily routine yet. Teachers, tutors, professors all have to be prepared for the challenges, what the unusual circumstances may cause. This section tries to provide some useful advices, tricks, hints, which might be helpful for a successful and enjoyable virtual classroom presentation.

First we are going to concentrate on the preparations just before the event starts. As we will see, these activities are quite crucial regarding the whole process. Then we are going to discuss some of the main tasks, what a presenter has to do during the lecture. This section will include different controls, which are essential for teaching and communicating with the participants. It is also important to establish interactions among the students and between the students and the teacher. We will also discuss what features can be used to get some essential feedback from the participants. At the end of the chapter we try to collect the main success factors of event leading.

We also provide examples from the experiences of the Department of Information Systems in the Corvinus University of Budapest. All the examples connected to the topic, are written in *italic.* The department has more than 6 years of experience in using e-Learning applications for educational purposes. The classes described in the next pages were conducted by the Centra system. This means that all the figures, tables came from that environment as well.
Example:

> *The Department of Information systems of the Corvinus University of Budapest (CUB) has a joint information management program with University Selye (US) in Komarno, Slovakia. Some courses in the program are taught remotely from Budapest, with the Centra system. One of the courses is called: "Introduction to the ERP systems, including SAP R/3". The examples in this section are mostly related to this international course.*

Preparation

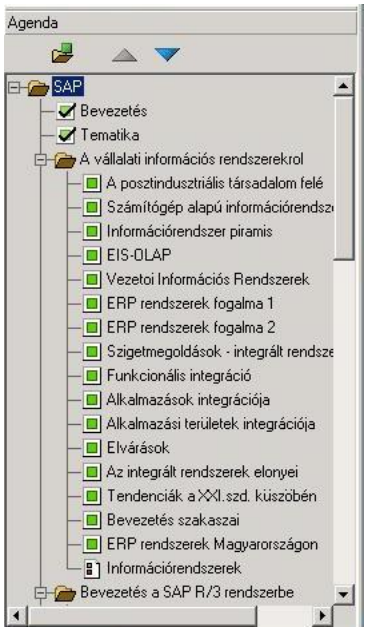
To make a successful virtual lecture some preparations are essential before the class starts. Just before we do anything in our e-Learning system we have to consider some critical points:

- Do we have all the presentation materials ready?
- What other applications we want to use?
- How many participants do we expect?
- How long the virtual lecture will be?
- Do we have all the supporting equipment? (e.g. microphones, speakers)
- Do the programs we want to use run well?

Presentation materials

It is quite essential to upload all the presentations into the system, what we want to use during the session, and organise them properly, as changing the content of the lecture during the session is quite difficult and time consuming. The uploading itself is usually not very difficult, e-learning platforms mostly accept the commonly used applications, like MS Power Point, which they convert to images, and those images will be visible for the audience. In the case of using power point slideshows, it is not possible after the uploading to change the content of the slides only the sequence.

A very elegant solution of the problem above, when our e-Learning system is connected to a Learning Content Management System (LCMS). In this case, we should just find our course in the LCMS repository and upload the contents into the e-Learning application. Using an LCMS is also helpful when we try to administrate the expected participants.



1. figure
Agenda in the Centra

It is not necessary, but it is quite helpful to make a draft outline (agenda, see figure 1) of the events during the lecture. In this draft, what we can also build up in the e-Learning application itself, it is possible to indicate where we want to use a special application, or use the virtual blackboard for explanations.

Example

During the classes it was necessary to use MS Power Point presentations to introduce the topics of the day, and in between the various topics the SAPR/3 system was used to demonstrate the previously provided information. When

putting the agenda of a specific lecture together, the following criteria were considered:

- *Which modules/transactions will be taught for the students?*
- *What kind of exercises do they have to deal with?*
- *What knowledge do they need to solve those exercises?*
- *How to present that knowledge?*

According to these questions the teaching material included 2-3 slides for each transaction, followed by application sharing. Application sharing means that the lecturer can show applications from outside the virtual classroom environment. These programs will be visible for the students, but they can't do any operation on them, just watching the teacher's activity. These blocks were quite useful, when the students had to do the labwork assignments. They just recalled the always on-line lecture content from the CUB's Centra server, picked the right block, and watch the tutorial again.

LCMS systems have two main parts: 1, Content management; 2, Learning management. If courses are well administered in the content management module, which must have a common repository, then the lecture notes and the student information can be relatively easily accessed from the various Virtual Learning Environments (VLE).

Applications

Before starting a lecture, we always have to consider which applications we want to share with the participants. We have to find out, whether that application is reachable from the computer, what we are going to use for teaching. It is also essential to check the functions we want to show, and try it in the e-Learning environment, as sometimes they appear in a different way. If we show a certain kind of program or function for the first time, it is highly recommended to record at least that part of the session and after the session share it with the participants throughout the internet, as they can benefit later from these materials. If we want the students to use the shared application outside the virtual classroom (e.g. we give them assignments, or the course includes some computer labwork as well), we have to make the program reachable for them.

Example

All applications, which were necessary for the course, were hosted by the CUB (Corvinus University of Budaprst). During the sessions the tutors showed the SAP R/3 system transactions within the e-Learning environment. The tutor showed and explained the whole process, what the participants had to use during their labwork. It was also possible for the students to use the SAP system itself, as

it was also reachable for all the participants, but only outside the Centra system.

Participants

The number of the participants is always a critical point. When we design a course, it is always a must to consider how many students will participate. According to our experience, if an online course has more than 20 participants, then the interactions, and the communication between the teacher and the students slows down. Asking questions, dealing with the feedbacks, organising the speaker-rights becomes more and more difficult. It is also very difficult to follow the classroom discussions, or deal with individual problems (explanations, technical problems). High numbers of students in a virtual classroom generate more possible problem sources, so the lecturer has to put more energy to solve the occurring problems, than transmitting the curriculum.

To avoid the problems above, it is recommended to make groups with no more than 20 participants, if they are all to sit individually in front of a screen. In case of groups which are sitting in front of one big screen or in a computer lab, listening to the remote teacher together, we can organise bigger groups as well, but then we have to make some important rules regarding the communication flow between the lecturer and the students.

When starting a course we have to be sure that all the participants, who have to take the course, are enrolled into the virtual learning environment, and have the chance to join the class. Sending out e-mails for all the participants, including the web address of the course is always a good idea to inform students about the forthcoming event. We have to be prepared to deal with forgotten passwords, so it is advisable for the lecturer to check e-mails just before the class starts. We can allocate more time for the problem solving, if we tell the students to join the classroom earlier.

Example

The information management major in US had 23 enrolled students and all of them took the ERP class, which was taught by the CUB staff. The students were participating in the virtual lectures in a common computer lab. The general information about the class was sent to all the students a day before, including a link to the entrance of the virtual classroom. Due to the awaited technical difficulties (lost password or connection, some students couldn't hear the voice of the presenter) the lecture could be started with 10 minutes delay. As the first students started to join the classroom 20 minutes before the start, we have to say that we spent almost half an hour to fix all the technical and administrational difficulties.

Supporting staff and equipment

There are several tasks, which have to be done before a session starts (see chapter 3.), but when we want to lead a class, we have to make a final check just before the beginning.

It is quite rare to manage to start the class without any technical difficulties. That's why we have to put lots of effort into the preparation of the technical background. Starting with the basics, we have to tell the participants that they can only join the discussion and hear the lecturer, if they have speakers and microphone attached to their computers. Even if we think that these devices are absolutely essential for the course, some students will definitely forget about them. In this case we can't really do too much, as we sit remote from that person and can't give the proper equipment immediately. If we find out the problem early enough then the participant may get some speakers from somewhere else, or join to another participant.

In case of big groups in a single room this problem can be solved quite easily, as people there can share their speakers. The absence of microphones is always a bigger problem, than the absence of speakers. In this case, the students are at least able to listen to the teacher, and provide some written feedback, but there will be no real verbal discussion during the lecture. It is also possible – if the students sit in a common room – that someone takes the role of the speaker, and communicate the "public" opinion and other comments towards the teacher.

Example

> *As the computer labs at US lack microphones we nominated a student to be the speaker. So this person became the link between the group and the lecturer. He indicated whether they had technical problems and answered our questions during the class.*

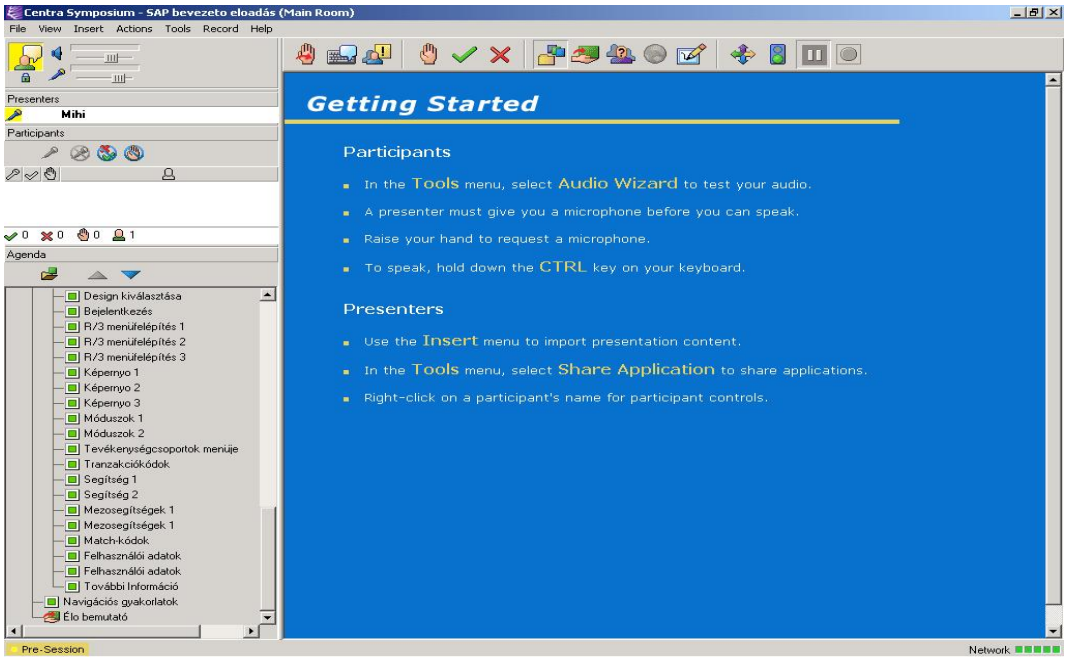
Length

Time management is also an important success factor. For a student, who was grown up on traditional classroom education, a virtual classroom lecture might be a bit boring. Sitting in front of the computer, listening, sometimes talking a bit to the screen doesn't seem very interesting at first. So the teacher has to organise the teaching material well, putting interesting issues, examples, into the discussion using animations, videos and other multimedia applications. But it is also essential to talk very well to the audience.

The length of a virtual class shouldn't be longer than a normal class, and the lecture should include more discussion and more interaction during a regular lecture. These interactions help to crash the monotony, which is one of the biggest disadvantages of the virtual learning environments.

Starting the course

To do all the preparations described above it is quite necessary to enter the Virtual classroom 10-15 minutes in advance. In addition to the tasks that the teacher has to do before the lecture starts, it is a good possibility to chat a bit with the students. It is important to ease the atmosphere of the class, as this way of learning is probably new for some of them, and they might feel themselves a bit strange for first time. Sometimes talking about the various locations of the participants might be interesting for the audience, showing this interesting learning situation.



2. figure
The Centra system tells you the most important features before the lecture starts. The agenda is shown on the left. This is the time for making the final test of audio devices.

Example:

Using a webcam can result in a more motivating atmosphere. Once, some students were using those devices just before the lecture to show the others around in their room. A big chat started when people started to find similarities between the different locations. Thanks to this idea all the people were in a very good mood, which is always nice when one wants to teach them something new.

After the introductory and technical discussions, the teacher can push the start button (see figure 3.), which means, that all the control has been taken from the other people, and the first item in the agenda shows up on everyone's screen. The recording starts, which is indicated by a big red light on the

3. figure
The teacher has to push the button with the green light to start the lecture

icon bar. From now on only the teacher can talk, or give the microphone to someone else.

Teaching

Controls

4. figure
The most important control buttons in the Centra system

Teaching in the virtual classroom needs lots of attention, as the presenter has to handle many functions at once: has to deal with the agenda, has to communicate with the audience (written and verbal communication as well), has to control the microphone, sometimes has to share other applications for better understanding, This very complex issue needs some support also from software side. On the figure 4, we can see the most important control features, what a presenter is able to use during the class in the Centra system. We can talk about communication controls, application controls and classroom controls as well.

Communication controls

The first 6 buttons (figure 4.) from the main icon bar belong to the communication features. Here the presenter can handle the hands, which indicates the willingness of speaking (1st and 4th button), join to the public chatroom (2nd). The green tick and the red cross mean yes and know. These buttons are used quite often to get fast feedback about the understanding of a certain issue.

5. figure
Microphone controls

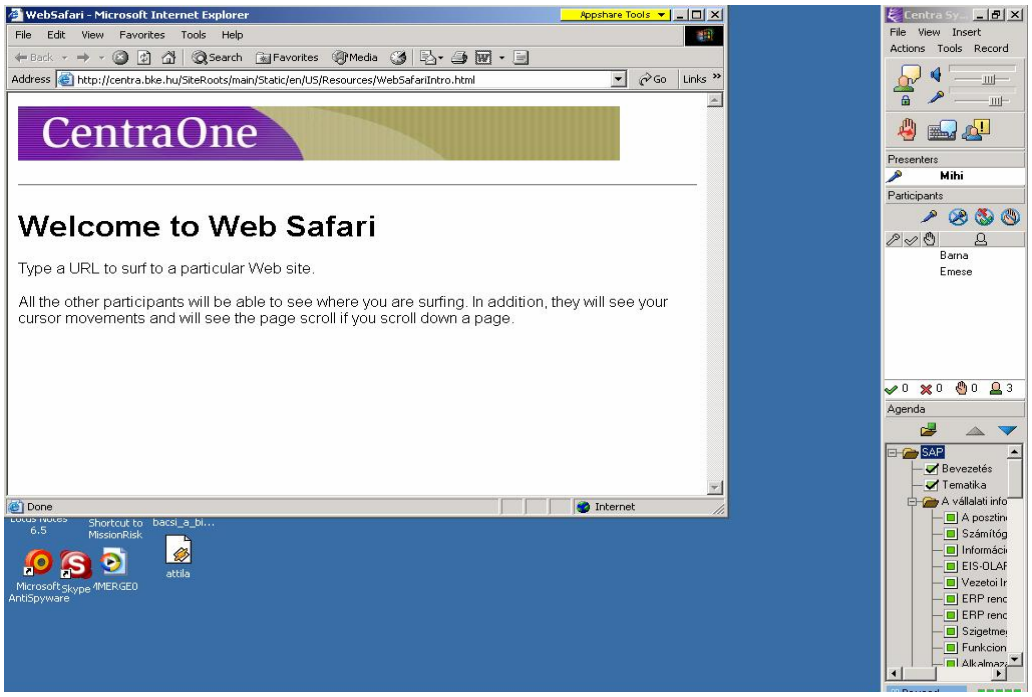
The teacher can grant and remove the microphone from others as well, clicking on their name in the participants list. Try to avoid giving out many microphones, as the discussion can be a bit chaotic, if all the participants want to speak at the same time. When asking decisive questions and receiving the yes/no answers the results will be shown on this small screen as well. (see figure 5.)

Application controls

There are several possibilities to share various applications with the audience. If the presenter wishes to do so, and pushes an application sharing button (The 7th, 8th, 10th button on figure 4.) then one of the running applications will be selected, and the audience will see that on the screen. The participants won't be able to use the shared program within the virtual classroom environment, but only watch

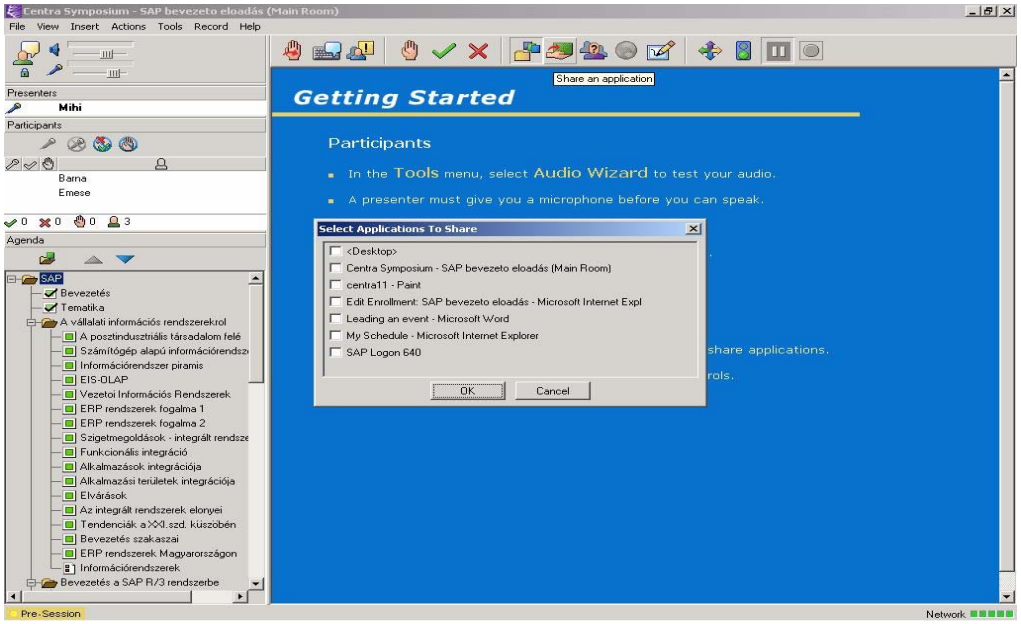
the teacher's usage and explanation. If we want the students to use the program we are sharing, then we have to step out from the classroom, and provide them with remote access to that special application, or make it available locally on their computers. If we want to do so, then we have to consider the fact that setting up a remote connection, or installing programs locally may cause many technical problems for the teacher and for the students as well. To avoid this we need to provide a helpdesk service, which can help the students in case of software problems. To build up a system like that needs more energy and effort sometimes than the teaching activity itself.

The most popular shared applications are the web browsers. (button 10th on figure 4; see example from the presenters point of view on figure 6.)



6. figure
Sharing internet browser within the Centra system

If we want to share an application other than a web browser, first we have to start that program on our computer. Once the program is running, we can share it with the others. All we have to do is to choose the application sharing button (button 8 on figure 4.) than pick one from a list, which shows all the running applications on our computer. (see figure 7.)

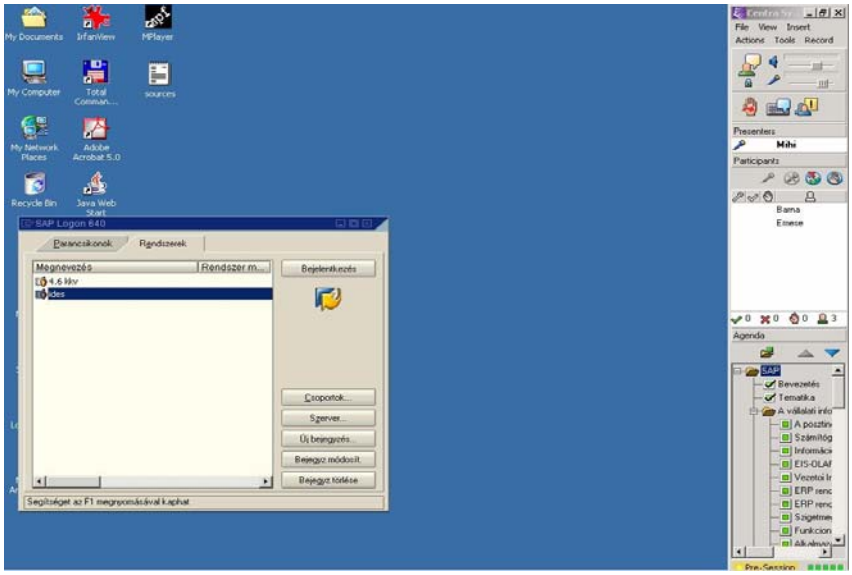


7. figure

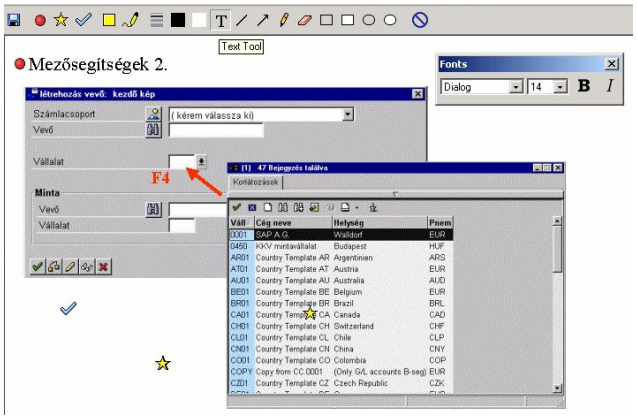
Application sharing: the presenter can choose from the list, which contains all applications running on the computer

Example

CUB provided SAP R/3 system to the US. The presenter of the subject shared the SAP system throughout the Centra system, which was quite similar to sharing a web browser. (see figure 8.). After the course students had to solve exercises using SAP, provided also by the CUB. This part needs lots of attention. Before the course starts the SAP clients must be installed on the participant's computers. Setting up the clients and the establishing a connection between the server and the clients needs professional staff, which is provided by the US (clients set up) and by the CUB as well (server side maintenance).



8. figure
Sharing an SAP R/3 application with Centra system

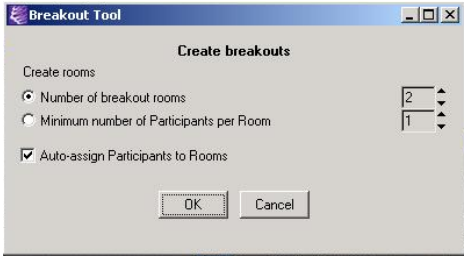


9. figure
Drawing tools

Using presentation tools in the Centra system are different than a usual power point presentation. Here the slides are images and including animations is not possible (if we have a ppt presentation that we want to show in this environment, first we must convert the slides into images). It is possible to decrease this disadvantage with the drawing tools. Drawing with these tools on the image-slides may help the presenter to emphasize the critical points. (see figure 9.)

Classroom controls

The most important classroom controls can be seen on figure 3. The first icon splits the students into working groups. In case of groupwork the presenter can form groups with this feature, put each student into one of those groups. The presenter



10. figure
classroom breakout

also has the right to entitle a group leader, who's going to have a microphone to tell the opinion of the group to the others. (figure 10.)

We can start and stop the session with the button next to the breakout icon. The buttons for recoding the session are situated on the right hand side on figure 3, next to the session begin/end icon. We can start and stop the recording anytime, in the case that we have recorder rights.

Presenter's activity

During the session the task of the presenter seems to be quite easy: she or he has to talk about the topic of the lecture, just like in a usual classroom. The only problem is that the teacher is not present physically. This makes the situation a bit more difficult as the students can't see the body language, the gestures, and the movements of the presenter. The lack of this presence has an effect on the student's performance as well. It is not so easy listening to a computer very long without any interaction, so the participants may get bored after a while. The following observations may reduce these strong side effects, but the results depend always on the personality of the presenters and participants.

Activity and visibility

It is quite essential to adjust our audio devices before the class starts, as a distorted, loud or too silent voice can be pretty annoying. We also shouldn't forget to ask this from all of the participants, who have microphones, and want to talk to the others. It is also advisable to speak up a bit during the lecture, and try to emphasize the main points with more examples and more detailed explanations. We should try to avoid the monotone speaking, which sounds like reading a book aloud.

If you have the chance to use a webcam, then don't hesitate to do so! The information transfer is always more fluent, when the presenter is also visible on the screen of the students. The lectures, where webcams were used, were always more interesting and also more efficient for the students and for the teacher as well.

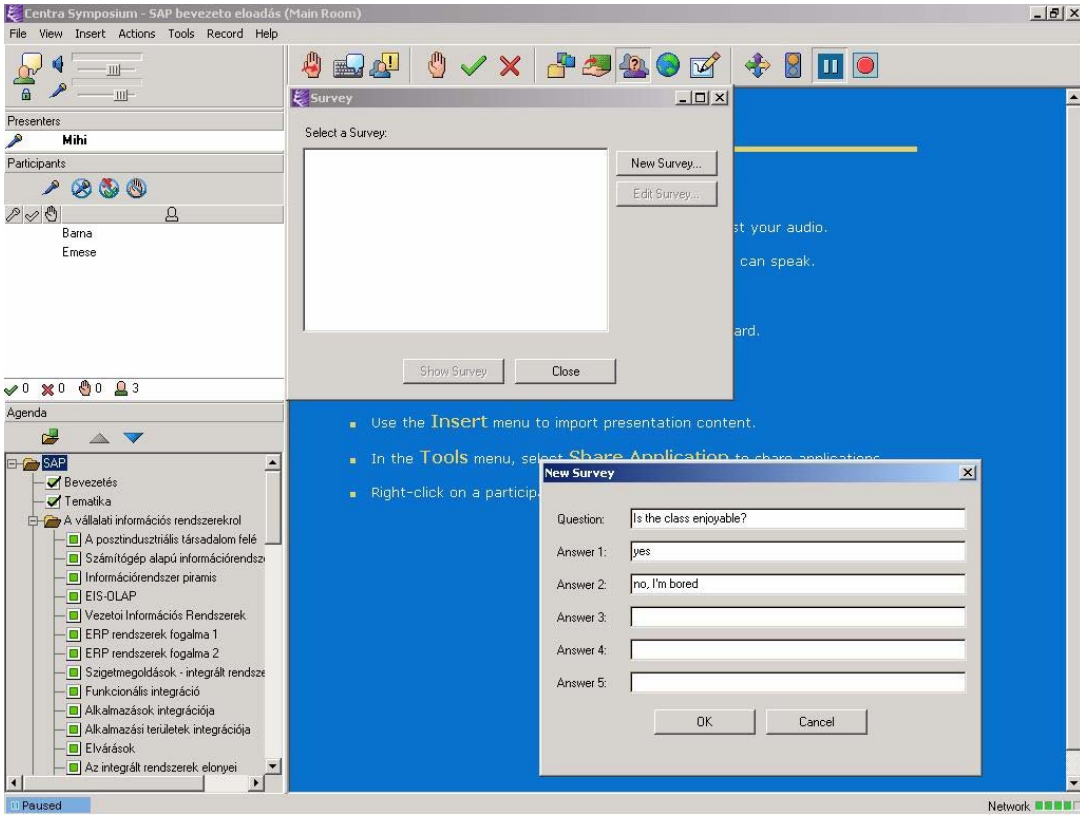
Continuous feedback

Getting feedback is good for everyone. It is good for the presenter, as she or he can consider the opinions and apply some changes in the information delivery to make it more efficient, and also good for the students, as they can indicate their difficulties and problems to the presenter, who may have the chance to give assistance.

There are several ways to get some feedback. The fastest way is to ask a decisive question like "Everyone can hear me properly? Click on the green tick if

your answer is yes." From the amount of green ticks we can see immediately who is listening, and who isn't. So we can start to investigate the reasons of the missing green ticks quite fast.

It is also possible to send a mini-survey to the participants. (figure 11) In this way we can get some pre-defined answers from the students about the question(s) we have asked. The information content of the answers is bigger then the yes/no answers, but it takes a while if we design the questions during the class. If we want to use this feature, then it is advisable to make some surveys before the class starts, and then we can easily apply them when we want. It is also possible to schedule these feedbacks in the agenda.

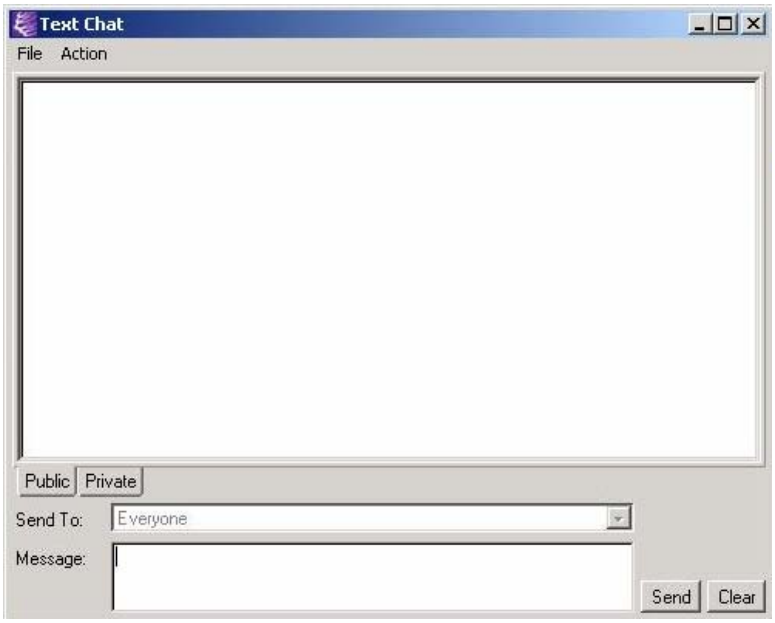


11. figure
Making a mini-survey in the Centra system

We can also get some detailed, written feedback if we join to the public chartroom of the classroom and start a discussion with the participants about the current topic. (It is also possible to ask them individually.) It's a good way to communicate with people, who have no microphone or their audio capabilities are broken.

Chatroom functions are also available for the participants. They are mostly used when the students join the lecture from various places, and are not sitting in a big, remote computer lab. It is quite useful to check out the conversation in the

public chatroom regurarly, as there might be some questions, recommendations, unclear points about the topic of the class (see figure 12. for a possible chatroom).

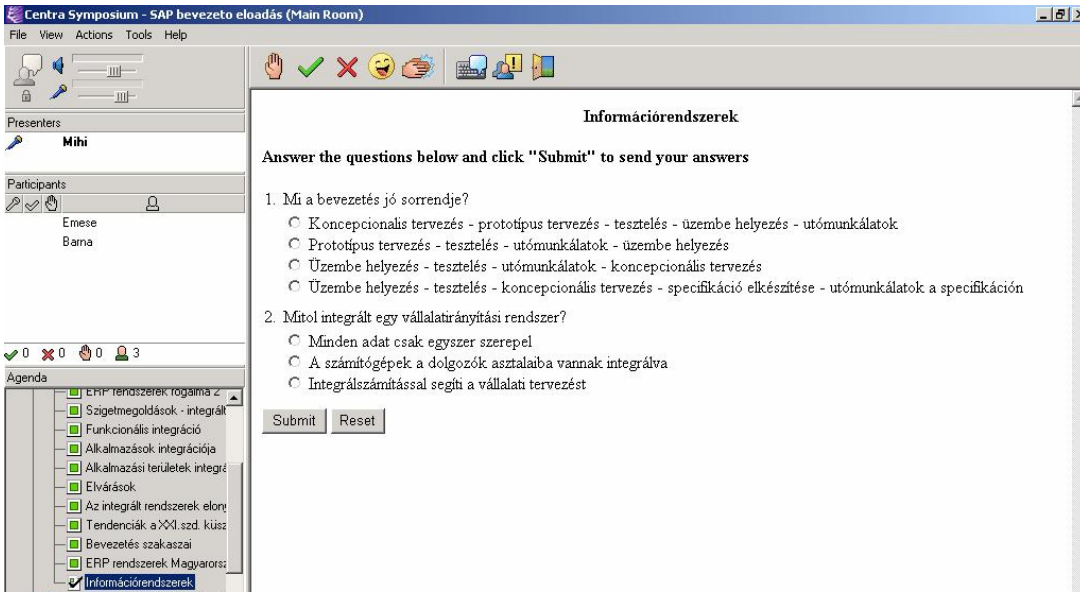


12. figure
We can send a message to the public chatroom and also for individuals

Finishing the course

If we think that everything important has been said, and the course should be ended, than all we have to do is push the icon, which was already described by figure 3, and log out from the session. But just before this there are some useful actions, events what we should do before letting the students leave the classroom.

As we have seen before, some short, written feedback is available in the Centra system. At the end of the session we can prepare a longer version, where we can ask questions about the most important issues concerning the lecture. (see figure 13.) We can include questions about the lecture's topic, about the virtual learning environment, which was used for the session, about the difficulties participants had to face with, and also about the user's satisfaction. This evaluation might be very useful in the future, when we have to design another course. It should be in the agenda of the class, and we should leave enough time for the students to fill all the gaps and answer all the questions. Usually anonymous evaluations are more reliable, but we can also ask for the name of the participants.



13. figure
A short example of evaluation. Here the students were asked about information systems (in Hungarian)

If we recorded the session, and want the students to access the recording after the class, we have to tell them how they can do that.

Key success factors

As a conclusion we have to say that leading an event in a Virtual Classroom is not as easy as it seems for the first time. The presenter has to solve different problems, has to teach in a very impersonal way, which doesn't ease the task. Leading a class is a real challenge that can be a daily routine as well, if we are careful enough and put enough effort on the preparations.

To ensure a successful virtual lecture we collected some key factors, important actions and features:

- Agenda, with good scheduling. Leaving enough time for the log in procedure, and for the evaluations.
- A virtual classroom lecture shouldn't be longer than a usual classroom lecture.
- Always control the audio devices before the class, and ask questions about the quality during the class
- Check the accessibility of the software, used parallel to the virtual learning environment in advance.
- Try to avoid monotony

- Try to generate discussions, interactions during the class.
- Use shared applications, demos and videos to explain the main points of the lecture.
- Mind the parallel microphone usage of the participants.
- Collect feedback from the students during the session.
- Check out the public chatroom during the class.
- Try to create a good atmosphere in the classroom.
- Try to use webcam or other video facilities
- It is always advisable to record the session. The participants should access the teaching materials and the recordings after the course as well.
- Always let the participants evaluate the lecture.

References

BOEZEROOY, GORISSEN (2003): *Dutch e-Learning in Europe, ICT and Education,*
www.surf.nl/en/publications, downloaded: 05/03/2005

Centra 7 Leader Guide (2003), Centra 7 version 7.0, www.centra.com

FLYNN, PERKINS, ZIJDERVELD (2003): *Cultural Considerations for Successful International Events,* www.centra.com, downloaded: 05/03/2005

MTA INFORMÁCIÓTECHNOLÓGIAI ALAPÍTVÁNY (2004): *E-learning lehetőségek a hazai felsőoktatási reform megvalósításában*, Budapest

PETTERSON, LIMBEEK (2002): *Design of a virtual clasroom*, The 34th Annual Conference of the International Visual Literacy Association, Breckenridge

Chapter 6

Promoting interactivity

Gearóid Kenny

This chapter discusses promoting Interactivity to include information on various student learning styles and how these can be accommodated within the confines of the synchronous virtual classroom applications. Key points on how to promote interactivity within sessions will also be discussed**.**

Introduction

Learners take-in and process information in many different ways including; seeing and hearing, reflecting and acting, reasoning logically and intuitively, analyzing and visualizing. Sometimes the learning involves only one of these methods and sometimes it involves a mixture of these styles. In addition on certain occasions learning will occur steadily whereas on other occasions it will occur in “fits and starts”.

Teaching methods of course also vary. Some instructors lecture, others demonstrate or lead students to self-discovery; some focus on principles and others on applications; some emphasize memory and others overall understanding.

Naturally mismatches exist between the learning styles of certain students in a class and the teaching style of the professor, when this is case the students become bored and inattentive, do poorly on tests, get discouraged about the courses, the curriculum, and themselves, and in extreme cases drop out of the program of study.

To overcome these problems, teachers in the synchronous virtual classroom environment should strive for a balance of instructional methods as opposed to trying to teach each student exclusively according to his or her preferences. If the balance is achieved, all students will be taught partly in a manner they prefer, which leads to an increased comfort level and willingness to learn, and partly in a less preferred manner, which provides practice and feedback in ways of thinking

and solving problems which they may not initially be comfortable with but which they will have to use at some stage in their professional life.

This module is broadly divided into two parts; the first examines some of the most commonly accepted student learning styles and gives suggestions on how these can be accommodated within the confines of synchronous virtual classroom applications. The second part looks at the issue of interactivity in this environment and the techniques that can be used to promote interaction.

Learning Styles

People as learners have a preferred style in which they learn. Many different learning style models have been promoted over the years such as Dunn and Dunn, Kolb, Felder-Soloman, Gregoric, Gardner, and Myer-Briggs. All agree that people learn in different ways. One is not necessarily better than the other, just different. In this section, a generic model is discussed.

There are several inventories where by answering questions a person is provided his or her preferred learning style. In general, people have a primary default as either global or analytical thinkers/learners. This is not to say that thinkers/learners cannot learn in a style that differs from the default style but rather one style is preferred over the other.

Synchronous learning systems from the perspective of global / analytical thinkers / learners

For the purposes of beginning this part of the analysis we have divided learners into two broad categories; global thinkers / learners and analytical thinkers / learners. A brief explanation of these two styles is provided below.

Global Thinkers/Learners need to see the whole before understanding the parts. The physical environment in which a global thinkers/learners does best would be a flexible learning environment with low light, music, very comfortable seating in typically informal surroundings.

Analytical Thinkers/Learners need to see the parts, usually in sequential order before understanding the whole. The physical environment in which an analytical thinkers/learners does best would be a structured environment with bright light, quiet, desk and chair and in general a formal environment.

From the above discussions it is apparent that environmental constraints play a very important role in deciding on the learning method to use, for that reason it is necessary to focus on some important environmental issues before moving on to

a deeper analysis of learning styles. Some of the most important environmental considerations include:

- Ensuring all participants have access to a computer.
- Checking all participants have Internet access
- The noise level of the environment - some areas, such as public office space, with distractions from colleagues ringing telephones, make it impossible to participate in a virtual classroom. Therefore the participants will need to be allocated a private room free from such distractions before participating in a session.
- Is training seen as an opportunity to get together? In other words, do participants see the physical classroom as a way to get to know people, or does the organization see it as a way to motivate a team. If so then the synchronous virtual classroom environment should be avoided.

The broad categorisation presented above does nothing to assist us in understanding how different learners can be best incorporated in a synchronous learning environment. Therefore it is necessary to break these categories down further in order to make recommendations on accommodating these learners in the virtual classroom environment.

Within these two broad and general groups of learners, there are also three different types of Global and Analytical Thinkers/Learners: Visual**,** Auditory**,** and Kinaesthetic**.**

- A visual person would say, “Let me see it!” In the visual area, thinking/learning may need to be drawn in picture form, called visual-graphic or visually seen in text form.
  Synchronous virtual classroom environments naturally support visual learners through the visual presentation of material. There are two types of visual learners: textual and graphical learners. To support both types of visual learners include text as well as graphs, charts, and / or pictures and diagrams.

- An auditory person would say, “Just tell me!”
  These users needs can also be accommodated successfully within the synchronous virtual classroom environment, as much of the material is delivered via audio run using internet technologies, principally voice over IP. In addition the needs of these users are met through the use of text chat and other online-chat tools where familiar language and real-time "talking" are key components so that the needs of these users are easily met.

- And a kinaesthetic individual would say, “Let me do it!”
  This group is probably the hardest to incorporate successfully within the synchronous virtual classroom environment as generally speaking the system requires students to play a more passive role. However there are a variety of tools within the application that support the needs of these learners. These include the use of quizzes and student tests to revise the knowledge transferred during a session. Breakout rooms where students are placed in small groups to work on a common task also provide an ideal mechanism to meet the needs of kinaesthetic learners. Here the students can be given a task related to the material presented by the instructor that requires them to “put into practice” the material that they have just learned. At the end of an agreed period of time the students are then bought back into the “main” classroom where they can present their findings to the other participants – thus reinforcing the skills learned and allowing the students to learn from each other.

Synchronous elearning systems from the perspective of commonly used learning theories

The most commonly used classifications of learning styles are the four Learning Modes identified by Kolb (1976) and developed by Honey and Mumford (1992). As there can be a tendency for us to teach to our own learning preference, an understanding of different styles is important.

In this section we look at these learning modes and then suggest methods for incorporating the needs of these users into the synchronous learning environment.

Reflectors

As the name implies these people reflect on different perspectives. They like to collect data and think about it carefully before coming to any conclusions. They enjoy observing others and will listen to their views before offering their own. Reflectors *work best*:

- in a support role rather than “up front”
- with ample time to observe and prepare
- collecting and recording data
- quietly observing

In the synchronous learning environment these people may respond well to

"open- microphone" discussions where others make contributions thus allowing reflectors to take time for reflection before replying.

Activists

Activists like to be involved in new experiences. They are open minded and enthusiastic about new ideas but get bored with implementation. They enjoy doing things and tend to act first and consider the implications afterwards. They like working with others but tend to hog the limelight. Activists *work best:*

- in short bursts not long lectures
- with others to articulate their learning
- with help around complicated data
- if allowed to experiment rather than follow instructions

In the synchronous learning environment these people need to be offered collaborative activities with variety – breakout rooms provide the ideal mechanism for meeting the needs of these learners.

Theorists

Theorists adapt and integrate observations into complex and logically sound theories. They think problems through in a step-by-step way. They tend to be perfectionists who like to fit things into a rational scheme. They tend to be detached and analytical rather than subjective or emotive in their thinking. Theorists *work best*:

- with limited demands on their emotions and collaborative problem solving
- with structure and clear briefing
- knowing the principles or concepts involved
- with other theorists rather than different learning styles.

In the synchronous learning environment these learners need a good structure with logical and methodical sharing and presentation of ideas.

Pragmatists

Pragmatists are keen to try things out. They want concepts that can be applied to their job. They tend to be impatient with lengthy discussions and are practical and down to earth. Pragmatists *work best:*

- if they recognise the obvious or immediate benefit

- with practice or guidelines on how to do it
- if there is pay back to the learning - they can do something better
- with activities as well as theory.

In the synchronous learning environment these learners need to be shown in advance why the e-activities, material and discussions are of practical use to them.

The final model of learning styles that we will examine in this analysis was put forward by Dr. Howard Gardner. He originally identified seven intelligences, and suggests most people are strong in three or four of these. The more intelligences used, the more retention increases. The seven intelligences identified by him are:

- Interpersonal
- Linguistic/verbal
- Logical/mathematical
- Intrapersonal
- Spatial/visual
- Bodily/kinesthetic
- Musical

The following table details interactivity techniques suitable for each intelligence. The techniques can be used in the synchronous learning environment unless noted (*).

Intelligence type	*Interactivity technique*
Interpersonal An aptitude for understanding other people and processing through interaction with them.	- Work in teams or pairs - Provide ground rules emphasizing collaboration - Debrief exercises - Swap leaders and mix up teams - Do role plays - Create and perform skits - Perform “think out louds” (a participant solves a problem by thinking the process out loud. The leader or fellow participants can offer coaching.
Logical/mathematical An aptitude for processing analytically.	- Use checklists and/or allow participant to create the checklist - Analyze/identify pros and cons - Develop flowcharts/diagrams - Make lists - Solve problems

	- . Categorize and prioritize
Linguistic/verbal An ability to express thoughts clearly through the spoken or written word.	- . Paraphrase a lesson - . Write poems, stories, imageries - . Keep a learning journal - . Create mnemonics/acronyms - . Design question and answer sessions - . Write skits - . Deliver small lessons to the class - . Do crossword puzzles and word searches
Intrapersonal An aptitude for thinking in quiet. Learning happens through reflection.	- . Reflect - . Set goals - . Do self-analysis and self-assessments - . Guide learners in visualization and imagery - . Do crossword puzzles and word searches - . Develop progress plans - . Keep a learning journal
Bodily/kinesthetic An aptitude for physical movement.	- . Physically act out product or process * - . Perform role plays - . Use emotion-packed stories and metaphors - . Provide hard-copy job aids - . Do scavenger hunts - . Do hands-on labs * May be challenging in the online classroom

Interactive Techniques and Learning Styles

Why Add Interaction to a Session?

Interactive techniques are useful in creating dynamic, active sessions that hold a participant's interest and increase retention. Participants in a recent online synchronous events were asked what makes a learning experience effective. They gave the following responses:

- Able to apply the material learned immediately to their job
- . Varied instructional methods; lots of hands-on opportunity
- The trainer involved participants throughout the course
- Small group activities helped tie what we learned to a specific context

Involving the participant and making the instruction relevant to the job yields obvious benefits. This finding is consistent with research done in relation to retention. In a recent study participants were tested to see how much knowledge they had retained after sitting a variety of training modules each of which used a different learning style – the table below details the results:

Nature of the module	*Knowledge retention*
Doing	80
Collaborating	70
See & Hear	50
Hear	30
See	20
Read	15

Notice the jump in retention between “See & hear” and “Collaborate” in the chart. The obvious conclusion here therefore is that once the participants become involved and active, learning and retention rates increase dramatically. Therefore answering the question “why add interaction to a session”

Learning Styles and Interactivity

There has been a great deal of research on learning styles and on how participants receive and process information. Because all participants learn differently, it is therefore necessary to provide a balance of learning activities to honor the learning diversity.

Interactivity Techniques

Below are some techniques that may be used to get participants more involved in an online synchronous session:

- Turn your bulleted lists into quizzes. Ask students to indicate if the statement is true or false.
- Replace keywords with blanks in the student guide. Participants write the keywords into their student handouts as you present.
- Use an online evaluation.
- Play a quiz game.
- Give each participant time to think of questions either he/she knows the answer to or would like the answer.
- Break participants into teams. Give each team a moment in a breakout room to choose a team name.
- Ask questions to the class. The first one to answer correctly earns their team points, which you can track on the whiteboard.
- Pair participants and ask them to paraphrase the key points from the lecture.

- Have participants keep an idea sheet. Have them write at least one idea they can use. At the end of the class, they have a list of the most important points.
- Have the participants diagram what was taught.
- Present a problem. Give everyone a moment to think about the problem. Pick a volunteer and have him/her try to solve the problem, encouraging them to think out loud. Possibly allow coaching from other participants.
- Pick a volunteer to share something they have learned. Allow that volunteer to then call on the next participant.
- Use stories, analogies, and metaphors when possible. Consider having participants generate their own analogies.
- Use peer teaching. Assign different portions of the content to a participant(s). Let them examine the content and present it to the rest of the class.
- Secretly give a few participants important questions before the session. Instruct them to ask these questions during the session (provide a cue to let them know when to ask.

Using these techniques not only ensures that the session remains interactive but that many key intelligences and learning styles are utilized. Of course the success or failure of any of the methods listed above will depend on how confident participants are in using the synchronous virtual classroom system in use.

Chapter 7

Assessment and evaluation

Gearóid Ó Suilleabháin and Deirdre Goggin

Introduction

The premise of the Socrates/Minerva-sponsored project "Virtual Classrooms in Educational Provision" is that virtual classroom software, as typified by products such as Centra, LearnLinc and HorizonLive, have received little attention on the European e-learning scene. Initial surveying by the project team[1] seem largely to support this idea and there are also indications that, despite a greater use of "live elearning" in the US, there is in general still little in the way of formal academic research with regard, for example, the effectiveness of VCT systems or indeed how they compare in effectiveness or popularity with more well-known e-learning solutions such as the now ubiquitous range of learning management systems.

In general, differences between European and US take up of such systems notwithstanding, it is probably true to say that "while asynchronous technologies have been widely adopted by universities …only recently have universities begun to adopt synchronous online communication technologies as a tool for delivering distance education."[2] This has had obvious impact on the volume (or lack thereof!) of research in the area, a deficiency which this paper, like other chapters in this publication, sets out to address.

The authors however have also chosen to look at a particular aspect of the practice of live e-learning which is itself somewhat under-represented in the general literature relating to e-learning: this is the issue of assessment, a little-examined process in the e-learning field despite the fact, for example, that many studies have shown the nature of the assessment process to be absolutely critical to the way learners see their role as learners, how they perceive the

[1] "Analysis and Report…"
[2] Knolle. 5

course in general and so forth.[3] As Dunn et al for example write in the introduction to their recent work on student assessment:

> "The important work of the phenomenographic researchers has shown that students approach a learning task with a surface orientation or a deep orientation according to how they perceive the learning task…the most influential factor in shaping those perceptions of those perceptions turns out to be the nature of the assessment task"[4]

In addition assessment in its formative function, which is what we are mainly concerned with when we speak of assessment for live e-learning, provides both teachers and students alike with appropriate and timely feedback with regard, for example, to the effectiveness of their learning and teaching strategies.
The assessment process and the results of that process are also of course a critical issue when it comes to the evaluation of e-learning programmes, be this the evaluation of the technology itself (in this case the range of virtual classroom products) or the evaluation of the use of the technology (e.g. how virtual classroom courses can be improved, how a teacher might improve his/her virtual classroom "performance"); this chapter concludes with a look at some issues of importance here.

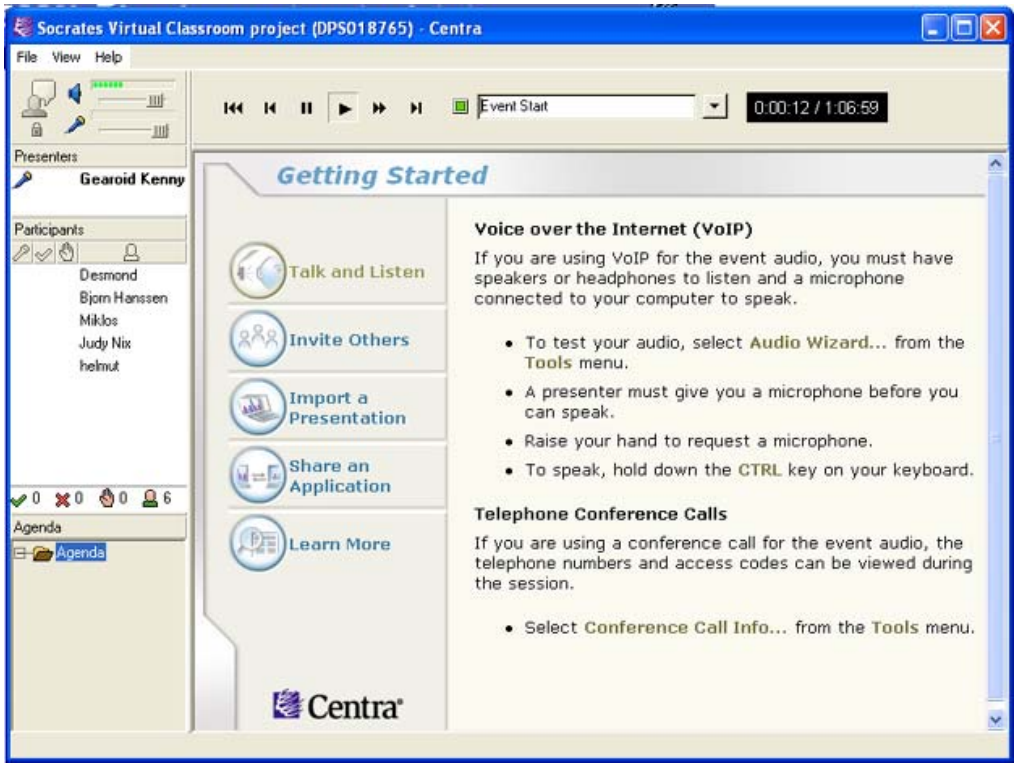
Virtual Classroom Systems

Live or synchronous e-learning is loosely defined here as "e-learning in which interactions between students and between students and the instructor take place at the same time (or in "real time")". It is to be distinguished from asynchronous systems like virtual learning environments which may make use of some synchronous features (such as text chat) on the basis that such systems are predominantly asynchronous. Live e-learning at least for our purposed here is also based on richly-featured commercial systems, often called "virtual classroom systems", such as HorizonWimba (formerly HorizonLive), Centra and LearnLink, which bring together a number of tools to manage a number of synchronous interactions via voice, video, etc. The HorizonWimba Live Classroom System, for instance offers a fairly typical list of features as follows:

- Multi-way audio (VoIP) and Streaming video
- Public & private text chat
- Flexible content area (usually used but not limited to displaying MSPowerpoint slides)
- Electronic whiteboard and polls, quizzes, and surveys
- Application sharing
- Archivable presentations
- Accessiblity for people with disabilities (this includes features such as closed-captioning of archived sessions for the hearing impaired and hot keys, and compatibility with most screen readers for the visually impaired).

[3] O Suilleabhain, 04.
[4] Morgan et al 10.

It is on the basis of these kinds of features that live e-learning is also to be distinguished from the educational use of other synchronous systems like stand-alone whiteboards, instant messaging and certain video conferencing and audio conferencing software. Less easily it is also on this basis that we would like to distinguish it from what William Horton has termed "online meeting tools"[5], which provide essentially the same kind of functionality as that outlined above but leveraged for the facilitation of virtual meetings as opposed to virtual training/classroom events, this is a difficult distinction to maintain however as sometimes, as with the case of Centra Symposium, one is dealing with precisely the same product merely marketed for a different use and target group.



Screenshot of the Centra Symposium Interface

Assessment Issues and Terms

A number of distinctions are made in the literature on assessment which will be of use in examining the assessment potential of live e-learning tools. One of the most fundamental is that between summative and formative assessment, described basically by Jarvis as follows:

> *"Formative assessment is conducted to help plan how teaching or learning should take place, or to alter teaching or learning while it is going on.*

[5] Horton. 239-250

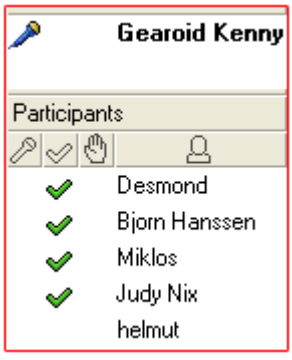
Summative assessment only tells us what has been leant at the end of a learning or teaching process"[6].

A second basic distinction is made between formal and informal assessment - the former being of the structured or official kind while the latter is exemplified by the sort of continual checking and monitoring of students a traditional classroom teacher will carry out to make sure certain points are being followed and so on. As will be seen assessment for live e-learning is mainly of the informal, formative variety, i.e. it is carried out in a loosely structured way for the main purpose of monitoring the learning progress "on the fly" as it were, and the results do not generally count towards a final "high-stakes" grading process.

The informal and formative nature of much live e-learning assessment approaches however need not mean they also have to be unimportant or unsophisticated: certain features of live e-learning software in particular those of application sharing and multi-way audio conferencing, offer affordances for *authentic* and *alternative* assessment, i.e. assessment types distinct from the conventional, assessments "that require students to generate rather than choose a response"[7] Such assessment is *alternative* in the sense of its being different to traditional testing (Barrett 2001) and *authentic* in the sense of testing a learner's ability to carry out activities that resemble authentic situations (Elton and Johnston 2002, 40).

Quizzing and Polling with Live e-Learning

One of the most obvious set of tools live e-learning software provides for assessment are quizzing and polling tools. Centra Symposium, which is typically of such software, offers a range of options here, the most basic of which is Yes/No Polling, a simple but potentially pedagogically effective tool to support the synchronous posing (via audio, text chat or slide content) of yes or no questions to participants and obtain instantaneous feedback that all participants can see.

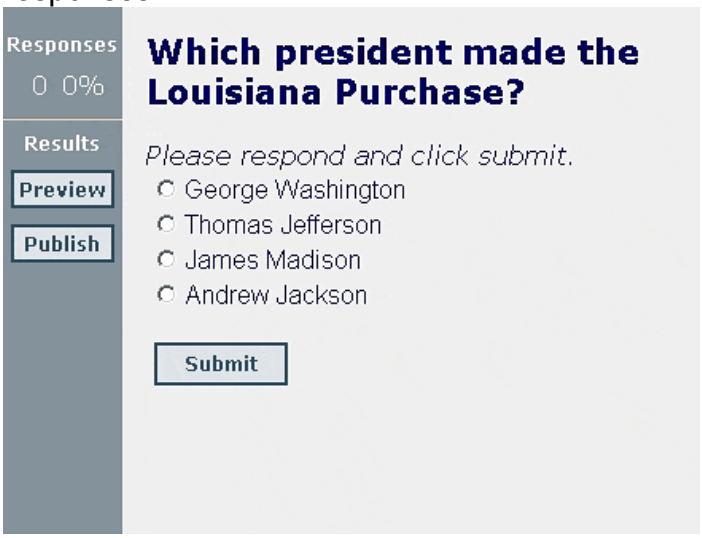


Basic Yes/No Polling in CentraSymposium

More complex tools are also provided by the typical live elearning system. The HorizonWimba system for example provides what it terms "Multiple Choice

[6] Jarvis. 159.
[7] Herman, JL, PR Aschabcker and L Winters. 2

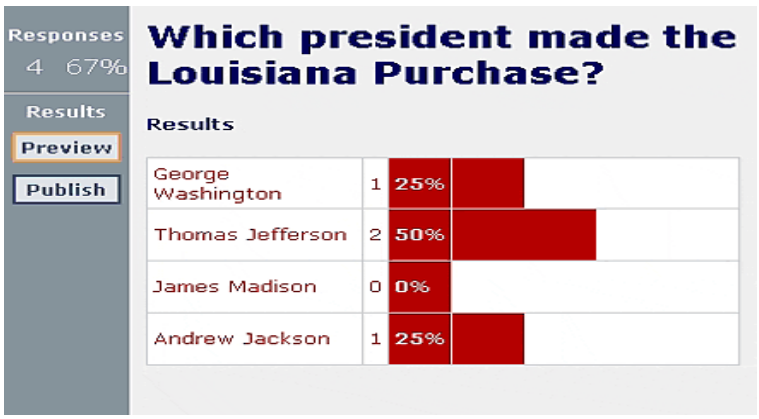
Polls", multiple-choice questions that are displayed in the main content frame (as shown in the graphic below) from which participants choose one or more responses.



Multiple Choice Polls in HorizonWimba

Live Elearning systems also typically offer presenters the choice to make multiple choice results public or to keep them private. In HorizonWimba once again when a multiple choice question is presented, the left edge of the Content frame displays the polling controls, *preview* and *publish* to presenters.

Preview enables the presenter to view the results as they come in. The participants screen does not alter when the presenter has selected this option. The **Publish** option, as the name suggests, allows the presenter to publish the responses of all the participants. All participants can then see the results in the content frame, which is also usefully saved automatically as a slide in the snapshots content folder. This latter feature gives the presenter the option to show poll results later in a presentation.



Multiple Choice Poll Results in HorizonWimba

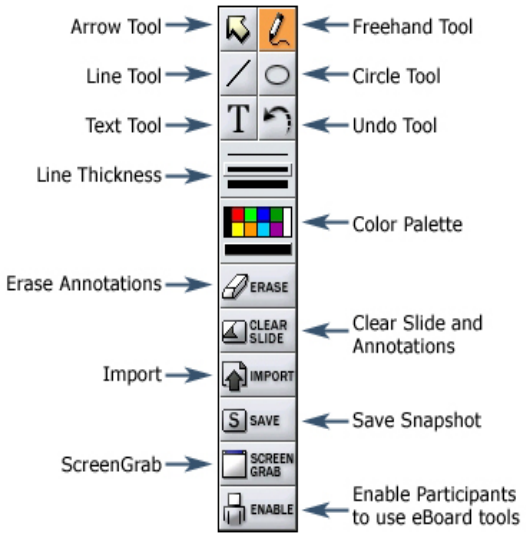
The table of results above, again from HorizonWimba, shows the number of participants that have selected each response choice, along with the portion of those responding (as a percentage) that have selected each choice. The responses can also be made to appear to include participant names and individual responses.

In HorizonWimba a third type of polling are *Open-ended polls* which are essentially open-ended submissions that participants can submit on invitation by the presenter. If other forms of quizzing and polling are comparable to the "quick fire questions" a teacher might ask in the conventional classroom the open-ended polls are like the short breakout activities that might be built into a class or training session. Whereas one of the great advantages of what we might call here close-ended polling/tesing is the ability as demonstrated to automatically compile answer this is not possible obviously with the open-ended variety; conversely of course open-ended polling allows the student more flexibility in their answer and arguably encourages leads to deeper learning.

Audio-based Assessments

One of the major selling points of virtual classroom software and reason perhaps for their greater appeal in the corporate rather than the HE world is the idea fact that traditional trainers can use them to more or less train in the way that they have always done. LearnLinc for example see themselves as taking the "traditional benefits of an interactive classroom experience" and improving upon it with "easy-to-use tools and features" and HorizonWimba state that "instructors can leverage their offline teaching abilities in combination with a robust set of tools unique to online delivery". The typical live e-learning session, like the modern face-to-face training event, consists of Powerpoint slides and commentary, the former being pre-prepared and uploaded to the virtual classroom server in advance of the session and the latter support via Voice-over-IP technology. There is no reason however why the same set-up cannot be used in reverse to allow students to present work as an assessment task, this could consist of a single individual student being tested for oral communication skills, presenting on a particular topic or presenting results of an assessment task performed outside the environment, virtual classroom software would also allow for groups to give presentations together.

Whiteboarding tools could also be assistance in supporting this kind of assessment task. The screenshot below shows the range of such tools (in HorizonWimba these are known as the eBoard tools) the HorizonWimba system makes available to presenters who can turn them over to participants to allow them to enliven their presentations using not just he ordinary drawing and writing tools to annotate slides and other content but to import images on the fly, and take screen grabs of anything on your desktop.



eBoard Tools in HorizonWimba

Whiteboard tools in Centra

Video-based Assessment

In the experience of the authors video is rarely used in the experience of the authors, due in no small part to bandwidth demands, however Virtual Classroom software typically do offer presenters and participants the opportunity to share video from an audio/video capture device.

Screenshot of the Centra Symposium video interface

Obviously the use of such features are limited only by logistics (i.e. how to organise video-based tasks and activities) and of course bandwidth, the latter however is a piece of infrastructure which is improving all the time and so is unlikely to remain a limited condition for much longer. As with audio-based assessment the most likely and practical assessment application for video sharing is for presentation purposes, yet observation of short practical tasks and projects could with sufficient planning also be supported.

Application Sharing and Authentic Assessments

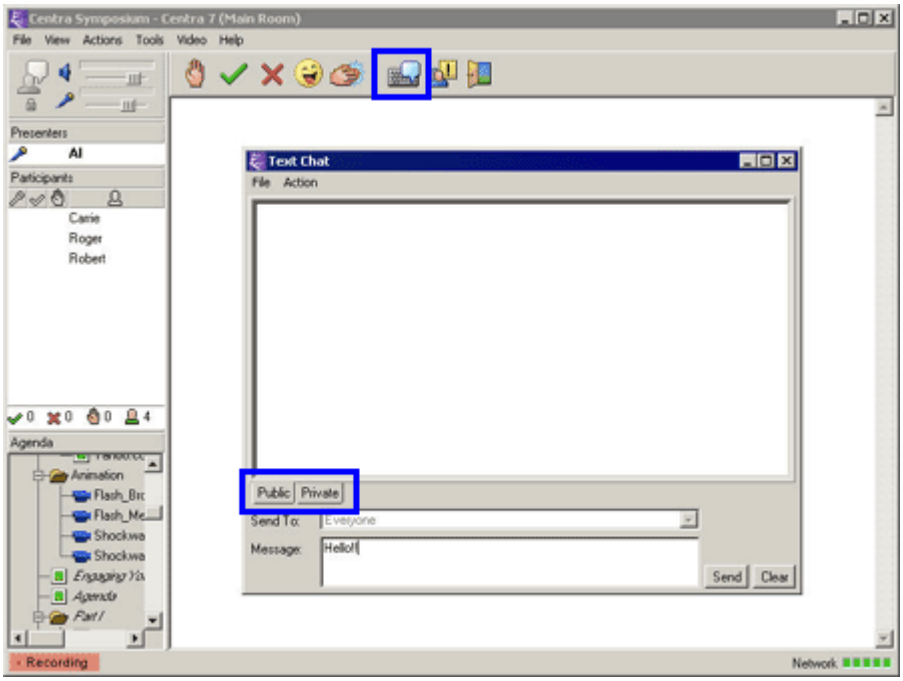
Authenticity, i.e. resemblance to real-world situations, is obviously a relative concept, not just in terms of there being varying degrees of authenticity but in the real-world situations being mimicked; virtual classroom software might not support the authentic assessment of real-world tasks involving for example psychomotor skills (except perhaps via shared video) but would work very well for the authentic assessment of real-world tasks which involve the use of any kind of PC-based software using the application sharing feature. In the HorizonWimba system the Application Sharing tool lets presenters show or share any application running on their computer with all participants in a presentation or to let participants share their own desktop with the rest of the group (the latter is a feature HorizonWimba call “Remote AppShare Request”).

In the context of authentic assessment this feature could then be used in one of two main ways: to allow participants to quickly perform a short task on the presenter’s desktop (affording the presenter the higher degree of control) or to allow participants to potentially demonstrate a number of tasks on their own desktop to the presenter and the group at larger (affording the participant the higher degree of control). Either way there are some exciting possibilities here and the ability to archive these sessions obviously adds greatly to the practicability of such an approach.

Application Sharing also of course opens up a world of possibilities with regard to taking learners beyond the world of the virtual classroom and into the broader virtual/actual world, bringing them on "web safaris" for instance or allowing them the opportunities to interacting with other content for live guided research and learning etc. A good assessment strategy will draw in these activities and find a way to provide feedback on them to learners.

Assessment and Chat

As remarked on by Knolle live e-learning actually provides more opportunities for student-to-student interaction than in the face-to-face classroom as "students can silently communicate by typing text messages to other participants without disturbing other students or interrupting the instructor."[8] These synchronous text-based interactions provide many beneficial sides effects for participants and presenter alike, primarily however it is used to encourage peer learning and arguably also for purposes of self-assessment, insofar as it allows participants to gauge their progress and understanding relative to the rest of the class.



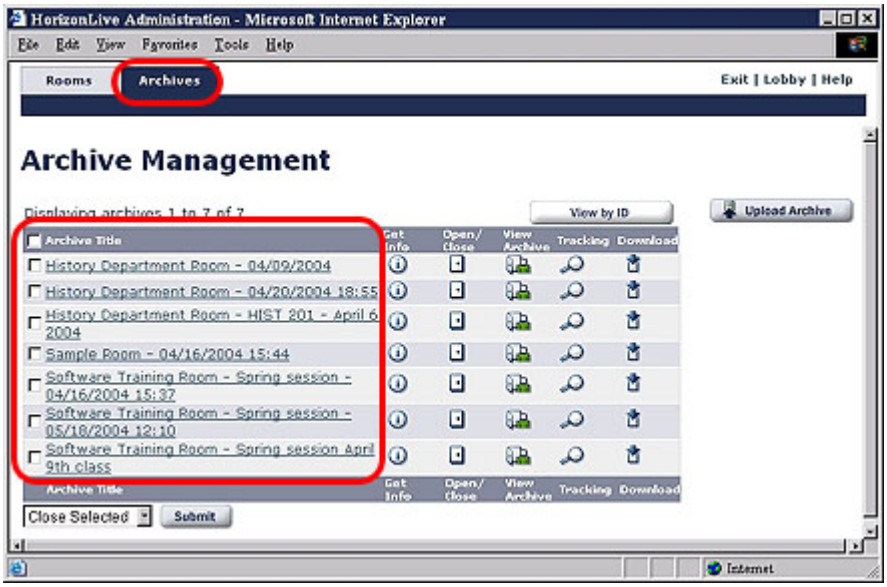
Screen shot of Centra Symposium text chat

> *Note:* The text feature must be enabled by the presenter to allow participants to communicate publicly or privately with each other. This extends the presenters control over when participants can discuss and communicate with each other, mirroring a more traditional learning environment.

[8] Knolle. 16.

Archiving

The ability to archive live e-learning sessions obviously adds much to the practicality of using any of the above features for assessment purposes; it is a feature primarily intended as a means by which students can review sessions but as a reviewable record of all virtual classroom activity it obviously provides presenters with a means by which presenters can review again the work or live activities of students before coming to a judgement of its value (be this in self-referenced, norm-referenced or criterion-referenced).



Screen shot of HorizonWimba archive management system

Note: Once a session is archived it can be accessed by the presenter in the archive management window. As it is a permanent record of a particular virtual session it can be accessed an unlimited number of times by the presenter to aid in the assessment of their own teaching skills and also the participants. This is a feature unavailable in the traditional assessment environment which overcomes the necessity on the presenter to record key points etc regarding the performance of an assessment task whilst simultaneously coordinating and observing said task.

Conclusion and Evaluation

A wide variety of assessment approaches for live e-learning have been briefly overviewed in this chapter and an effort make throughout to reference these to the real features of two main commercial live e-learning systems, HorizonWimba and Centra Symposium. Much attention, as befitting the technology, has been given to approaches involving synchronous interactions between learners, be this

with regard to simple text chat or online group presentation. As such perhaps some overall guidelines for such assessment strategies should be offered as part of this conclusion[9]:

- Basic tools such as simple polling should be used throughout to provide cheap but effective interaction with regard to, for example, peer assessment of "good examples"
- The activity being assessed should however be a good fit with the learning objectives of the overall course/lesson
- The relationship between the assessment activity, other assessment activities and the learning outcomes or competencies should be make explicit to the learners
- The value of interaction to the learning process and to the learners themselves needs to be make explicit
- Clear assessment guidelines and assessment criteria should be provided to learners

As pointed out earlier the Archiving feature provides a great tool for presenters to look back and see "what worked" with regard to various assessment approaches and also in allowing presenters with a means by which presenters can review again the work or live activities of students before coming to a judgement of its value (be this in self-referenced, norm-referenced or criterion-referenced). Archiving is also of course *the* feature par excellence when it comes to actually evaluating an overall "piece" of live e-learning, be this with a view to evaluating the technology itself (i.e. a particular virtual classroom products) or the evaluation of the use of the technology (e.g. how virtual classroom courses can be improved, how a teacher might improve his/her virtual classroom "performance") not least because much of the hard work of technological or programmatic evaluation is in designing and implementing data gathering strategies, a job made undeniably easier by the archiving feature which creates a permanent (or near-permanent!) record of all activities, by teacher and student alike, in a format that can be accessed an unlimited number of times and searched with relative ease for key data and evidence with regard to the kinds of issues indicated above and others as appropriate to the objectives of the evaluation.

A final caveat however, live assessment results and archived sessions will only take an evaluation so far, wider context is provided by the whole range of stakeholders in the educational process and the settings in which the learning is to be applied down the road. In terms of Kirkpatrick's famous hierarchy of evaluation imperatives, live assessment and archiving can but really address the first two levels, i.e.

- *Reaction* – what did the learners felt about the learning?
- *Learning* – were the learning objectives of the course achieved (it is hoped that this chapter has made some useful suggestions in this regard)?

[9] Based on a list from Hyde et al.

While offering little in the way of data in support of the last two, summarised here as:

- *Behaviour* – has learning/training transfer taken place (as evidenced by behaviour "back at work")?
- *Results* – what difference the learning/training has made to the learner's organisation?

As with the assessment of learning itself the evaluation process for all modes of learning and teaching, must be based on a sound strategy that itself begins with a clear idea of what it is we want to measure - only then it be decided what stakeholders to include in the process, what data gathering/analysis strategies best recommend themselves etc. If one's chosen mode of delivery is to be that of live e-learning however it may be said that with a well-structured approach to learning assessment and through judicious use of the range of tools outlined in this chapter, much of the work in implementing an evaluation strategy, at least to the extent of the first two of Kirkpatrick's hierarchy, is made far easier than would be the case in, for example, a face-to-face context, speeding up the overall evaluation process and offering opportunities in turn to speed up the improvement of old courses and the development of new ones.

References

"Analysis And Report On Use Of Synchronous E-Learning Systems In Europe". Ericsson Education Dublin, Ireland et al. Project Report. Accessed 1 May 2005. <http://learning.ericsson.net/virtual/docs/workpackage2.doc>

Barrett, Helen. "Electronic Portfolios". *Educational Technology: An Encyclopaedia*. ABC-CLIO, 2001.

Elton, Lewis and Brenda Johnston. "Assessment in Universities: a critical review of research". LTSN Generic Centre, January 2002.

Herman, JL, PR Aschabcker and L Winters. *A Practical Guide to Alternative Assessment.* Association for Supervision and Curriculum Development, 1992

Hyde, Patrcia et al. The development of quality online assessment in vocational education and training. The National Centre for Vocational Education Research, 2003. Accessed 5 May, 2005. http://www.ncver.edu.au/research/proj/nr1F02_1.pdf.

Jarvis, Peter. *The Theory & Practice of Learning*. Kogan Page, 2003

Knolle, Jonathan W. *Identifying the best practices for using HorizonLive to teach in the synchronous online environment*. Masters thesis. California State University, 2002

Morgan, Chris (ed). *Student Assessment Handbook: New Directions in Contemporary Assessment*. Kogan Page, 2003

Ó Súilleabháin, Gearóid. "The e-portfolio: a tool for authentic assessment". *New Assessment for a New Learning*. Conference Papers. CIT Press, 2004.

Chapter 8

Blended learning

Judy Nix

This chapter will discuss what blended learning is, why it should be used, the current components, how it sits with other methods of learning and the economic considerations.

What is blended learning?

Blended learning is the combination of two or more delivery modes to meet a specific set of learning objectives. So in some respects, blended learning has been with us since the beginning of time.

In the current environment, however, it represents a profound change for the whole concept of learning which is to move to a learner-centric approach that is sensitive to the real needs of both the learner and the environment in which the learning takes place. Blended Learning offers flexibility and convenience, important elements especially for those in the workforce. It puts responsibility on the student to actively take part in and be responsible for his or her own learning. “Self-paced learning” is often used in conjunction with blending learning. Self-paced learning is where the student plans his/her own study program usually incorporating eLearning and instructor led training in a way that best suits study or work requirements. It is important to remember that by trying to create the perfect learning environment new pedagogies and technologies need to be employed. Organisations require new approaches to knowledge transfer and performance that are closely aligned with business goals. Corporate training exists to improve business performance thereby increasing revenue or reducing costs. This creates an opportunity to decide how learning modules are designed and delivered.

Why should we use blended learning?

It is widely acknowledged that people learn in different ways so a single approach will not be successful. Blended learning allows a good balance between instructor-led training (ILT) and electronic (e) training that comes in many different forms. Learning can take place anytime, anywhere, anyplace facilitating the needs of the learner.

It is important that the learner sees blended learning as a positive way to learn not as a cost saving exercise.

Blended learning improves the learning outcome by matching how a learner wants to learn and the learning content.

In the beginning of the 20th century Piaget started to study the learning process among children.

The following steps for learning are taken from Piaget:

1. Motivation – interest and curiosity – mental preparation and to be receptive
2. Information – new data and information, that fit the motivation, are added
3. Processing – the brain is searching for new patterns, associations
4. Conclusion – AHA! A new gestalt is formed
5. Application – the understanding is applied, checked and reinforced
6. Evaluation – was the learning worth the time and energy spent

In all blended learning these steps should be present. Learning is a very personal thing, based on the previous knowledge and experience of each and every person. Learning is also a social activity. The social interaction between instructor and student and between the students is about helping the student to process new information and to add on new knowledge.

Students generally want to learn and develop, to confirm their knowledge and skills, be part of a community with their peers and to avoid anxiety surrounding their performance. Evaluations show that students think that a blended approach is better than classroom training on its own.

Blended Learning Components

Currently the main blended learning components include some or all of the following elements:

Instructor Led Training (ILT) – traditional classroom training where a teacher and students are brought together in one specific location for a specific time.

Virtual Classroom Training (VCT) or Synchronous eLearning or Live eLearning – is a live broadcast of a lecture/lesson/module by a teacher to a class who are separated in space but not in time, over the internet. A VCT session can be recorded and played back for clarification and re-enforcement when it then becomes an eLearning offering.

eLearning – refers to any learning module delivered by electronic means.

mLearning – the provision of a learning module that can be downloaded to PDAs, Smartphones, mobiles and hand held mobile devices.

Web Based Learning (WBL) – internet based training courses that can be taken individually or as part of an online training flow. The web-based courses normally include full multimedia, sound animations etc.

Mentoring – where an experience person is available to the learner to answer questions and clarify issues. Also provides encouragement to complete learning modules.

Streamed Media – pre-recorded seminars or lecturers that are streamed over the internet and can be replayed at any time by the user.

Online Publications – typically short articles providing information on topics of interest.

CD-ROM – pre-developed course material, which can be played and replayed at any time by the user.

Webinar – online seminar broadcasted over the internet.

Structured Knowledge Transfer (SKT) - is an on-the-job program that focuses on mentoring individual employees in their actual work environment for optimized competence transfer.

Email – internet messaging system, which facilitates interaction between students and tutors

SMS – mobile phone messaging system, which facilitates interaction between students and tutors.

A Blended Learning Solution

Creating a blended learning solution relies heavily on the learning objective. Consideration needs to be given to the following criteria:

1. Who is the audience?

How many people need to be trained, are the all from the same department or spread through the organisation. Are they spread geographically throughout the country or throughout the world?

2. What is the learning goal?
   Assess what needs to be learnt, what are the business objectives?

3. What level of knowledge already exists?
   Undertake a competence gap analysis/training needs analysis to assess what is already known.

4. What is the learning content?
   Based on 2 & 3 above, established what should be contained in the learning module.

5. How best can the content be delivered?
   What should be self-paced and what should be instructor led?

6. What is suitable for group exercises?
   Are their elements of the learning module, which would benefit from a group dynamic such as practical exercises?

7. How to combine the components?
   Assess which elements are suited to which medium e.g. pre-requisites for the course could be taken by WBL, a structured logical section could be delivered by VCT, practical exercises could be delivered by ILT or SKT.

8. What infrastructure is required?
   Does the student have access to a CD player, computer network with sufficient bandwidth to run eLearning content and VCT, test equipment for practical exercises, a classroom for group ILT.

9. What measurements are required?
   It is sufficient for the student to be able to answer questions on the learning module or does an exam need to be passed or does the student require a certificate stating that he/she can competently undertake a work task.

10. Does the cost justify the benefits?
    It is important to assess the cost of content development and delivery. eLearning content can be expensive to develop as it may contain highly interactive and media rich elements. VCT can be very economical as the medium forces the content to be precise and targeted. As VCT sessions can be recorded and played back, it is effectively two products for the price of one. Costs savings such travel and associates costs of hotel accommodation and daily expenses, saving time and keeping essential

staff on site, just in time training, enhancing the ILT experience, delivering a company wide solution, employee empowerment, mixed media are all important elements when assessing cost benefits.

To underpin an effective approach to blended learning, a sophisticated Learning Management System (LMS) and Learning Content Management System (LCMS) are essential. It is important to be able to store and retrieve learning content for different media easily by the student. It is also important to track what modules have been undertaken and what tests have been passed to provide an accurate record of training.

Methods of Education Provision

Instructor Led Training (ILT) is the traditional form of education. The vast majority of primary, secondary and third level education is provided by a teacher/tutor/lecturer standing in front of a classroom of students. It is of particular value to students who learn best by working with others, listening, viewing and questioning. It is also good for people who have difficulty structuring their time.

Distance Education is well established at higher education level and it continues to expand rapidly as people adopt a life long approach to learning. Research has shown that distance education requires students who are self-regulated and independent. In the past distance education has relied on hard copy courseware and, in some cases, student support services which would include the provision of a tutor, telephone communication, correspondence communication, audio conferences and occasional seminars or tutorials. Online courses are now part of the offering along with VCT, which enables the students to gather at a specific time to participate in a learning module, which allows live interaction with both the tutor and other students. However, in the US distance learning is interpreted as a teacher delivering a lecture to the group of students via VCT or videoconferencing.

eLearning or Online Learning or Asynchronous Learning is based on learning module/courseware being provided to the student by electronic means for individual study. Not surprisingly, research has discovered that some students experience difficulty adjusting to the structure of online courses, managing their time in such environments and maintaining self-motivation. Students speak of confusion, anxiety and frustration due to the absence of feedback from instructors. It may be that the reasons some online courses suffer more dropouts is less related to the course delivery medium and more related to the online course design and pedagogy employed. Education institutions have acknowledged these problems and support this learning method with student support services. Examples of student support services are tutor contact, telephone counselling, correspondence contacts, assignment correction, virtual classroom training, audio-conferences, email etc all of which are designed to

support the material being studied. However, the corporate model seems to be based on the elimination of human contact. This is changing as corporate is beginning to realise that eLearning is enhanced by the provision of student support services.

Virtual Classroom, Live eLearning or Synchronous eLearning is where a group of students is gathered together at a certain time, for a certain duration, who are separated in space but not in time and are taught electronically by a teacher using a web browser with integrated voice and video as the main delivery medium. As the sessions are recorded, the learning module is both synchronous and asynchronous. It can be replayed for clarification and reinforcement. Synchronous elearning systems are comparatively little known and little used in Europe whereas they are very popular in the US. Students have the advantage of the flexibility of studying on their own and the social advantage of belonging to a learning group.

Economic Benefits of Blended Learning

Hitherto fore learning was strongly associated with the classroom. This necessitates students to travel to a specific location at a specific time for a specific period. The cost implications are high. The provision of a classroom, travel costs and in some cases accommodation costs and daily allowances can be high and eat into training budgets. It is, therefore, prudent to evaluate how best to ensure the learning required is delivered.

Prerequisite training can be taken by electronic means to ensure that when the students arrive in the classroom, time spent ensuring everyone is at the same level before the real course begins is negated. eLearning modules can be very expensive to produce especially if media rich. However, if the number of students is high then it can be a very cost effective method. Some learning modules demand interaction between the participants, which can be solved by the use of VCT. This recreates the benefits of classroom without a lot of the attendant costs. However, the IT infrastructure must be stable otherwise time will be wasted and learner confidence will be lost. It is important when constructing a blended learning solution that the cost effectiveness of each element is assessed to ensure the best possible value for money.

Conclusion

Learning needs to take place anytime, anywhere, anyplace facilitating the needs of the learner. Blended learning improves the learning outcome by matching how a learner wants to learn and the learning content. Virtual Classroom with its inbuilt blend of traditional (tutor lecturing students) and eLearning has a strong role to play.

Learning is not about the medium. It is about the outcome.

Chapter 9

Virtual Classrooms in European Higher Education

Miklós Bíró, András Gábor, Gábor Kismihók

Introduction

In this chapter we try to give a brief introduction into the relationship between the European Higher Education scene and the usage of Virtual Classroom Technologies (VCT), providing some country examples as well. As the length of this study is limited, we try to describe only the most important issues and facts, regarding the virtual learning environments at the European universities.

In the next few pages we will give a description of the main European Union e-Learning initiative, which was accepted and announced by the European Commission, giving a short overview about the main items of the initiative.

Than we discuss the most relevant item for the European higher education called Virtual Universities. We describe what does the term Virtual University mean, and how it should work. At the end we try to summarize the performance of the European Universities regarding this issue, using the outputs of several European research projects.

To give a bit more detailed view about this sector we also provide a regional overview. As the writers of this chapter are coming from Central Europe, we start with the description of the Central and Easter European e-Learning scene, showing the main problems and the future prospects as well. We also show some Western European examples (Scandinavia, Germany), which are worthwhile to consider by emerging regions like Central Europe.

In this chapter we mostly rely on the outputs of the European Socrates/Minerva project: *"Virtual Classrooms in educational provisions – synchronous e-Learning systems for European Institutions"*.

e-Learning and the EU

The European Union in 2003 launched its e-Learning development programme, called „Programme for the Effective Integration of Information and Communication Technologies (ICT) in Education and Training Systems in Europe (2004 – 2006)". This initiative had 4 major action lines (European Commission, 2003)[1:]

1. Promoting digital literacy
   European citizens must develop their skills, to be capable of understanding and digital contents. Without this skill members of society can't participate in the digital society. The goal of this initiative is to provide ICT assistance to the people, who don't have the chance to connect to digital materials, due to their geographical location or social situation. The establishment of the European Digital Society is one of the most critical issues in the e-Learning programme, as this society should be the domain of the competitive European economy.

2. Establishing and supporting European digital campuses
   Improving educational institutions is another important priority of the EC. The implementation of new organisational models (virtual campuses), the encouragement of co-operation between the European higher education institutions and the development of new mobility schemas are the main goals of this item.

3. Developing partnerships between schools (e-Twinning)
   This goal also emphasizes the network developing between educational institutions, at the level of secondary schools.

4. Promote e-Learning throughout transversal actions
   Promoting best practices, products and services, which were developed by the various projects, founded by the EU or the member states belong to this item. The main idea here is to build up a network between all those institutions, companies, which participated in e-Learning projects, in order to disseminate the previous results and find the synergic points in the different research products.

The infrastructural differences between the member states, especially between the EU15 and the recently joined EU10, are critical. We can't really talk about universal European e-learning market. There are leaders: Sweden, United Kingdom, The Netherlands, Finland where the internet and the computer penetration are quite high, and furthermore the big majority of people speak English. (The e-learning applications are mostly available only in English) And

there are some countries, which still have basic problems (mostly financial) with the introduction of the ICT infrastructure (Latvia, Slovakia).

Virtual Universities

It is not a surprise that the concept of the virtual universities is spreading fast among the countries, which have good ICT infrastructure, like the Scandinavian countries. According to their ideas a virtual university (VU) doesn't want to be a real university, which has to educate students and after they have completed all the requirements, grant them a degree. A VU has to support networking and teaching activities at its home university, which includes the following tasks[2]:

- Providing valuable, network based learning and supporting educational services
- Coordinate the activities of the on-line educational services, the student advisor systems and the research networks
- Record and organize the different teaching content, including the development of the suitable databases for this purpose
- Establishing and maintaining the student administration
- Produce publications
- Produce draft agreements to facilitate its activities
- Establish organisational bodies
- Collect fees to finance its activities

We can also make another list of the VU's main guiding principles, which are based on the activities of these virtual institutions and on the collaboration between the VU's stakeholders.

- Trust between the partners, which is essential for networking.
- Self-criticism, which means the continuous service evaluation of the home and partner universities.
- Support creativity throughout providing a motivating, rewarding working environment
- A virtual university establishes a working area for the host universities and their partners. The direction of the development is characterised by the VU.
- The activities of the VU enable the equal access to the research and development services.
- Participate and use the benefits, coming from international projects: getting familiar with the findings of other national professionals, and provide access to foreign experiences.

- VU supports the education whose aim is to provide Life Long Learning and doesn't depend on the geographical place. It is also essential to include the idea of sustainable growth into every single activity.
- A VU's goal is to provide high level services, concerning the conditions, which are set by the need of the economical efficiency.

In Europe individual-based e-learning systems are now widespread and there is hardly a university or college that does not offer e-learning courses. As in the distance learning period, however, the group-based systems are little known and little used. These group-based e-learning systems are variously known as 'live e-learning' or 'synchronous e-learning systems' or 'virtual classroom training systems'.

A Danish consultancy PLS RAMBOLL Management has carried out a strategic study of virtual models of universities for the European Commission, DG Education and Culture during 2002-2003. The study established that the EU universities could be categorised into four clusters concerning their current use of ICT and e-Learning in the organisational and educational setting[3]:

1) Front-runners; (16%)
   These universities have already managed to integrate ICT solutions in on-campus administration and teaching, they offer various e-Learning courses for academic and supplementary courses as well. They established a wide international research and development network, and made strategic co-operation with several other universities and private companies.

2) Co-operating universities; (33%)
   These universities have also a well developed ICT infrastructure, which supports academic education, but e-Learning courses are not offered as frequently as in the front runners group. They mostly offer only minor extensional courses for academic programs, but in the future the number of the courses in a virtual learning environment will increase. The co-operating universities have also a very efficient, international network in the background.

3) Self-sufficient universities; (36%)
   These institutions think about ICT development as a key success factor, but developments are lagging behind the first two groups. The reason for this is that the management can't really motivate the teachers to use the latest ICT technology in education. The involvement of these universities in European projects is not as high as the institutions of the previous groups, their international partner network still needs futher developing as well.

4) Sceptical universities. (15%)

These universities are very poorly developed in ICT skills. The electronic administration, ICT supported education still needs to be implemented. In some cases they offer e-Learning courses, but these initiatives are quite rare. The university staff and also the students are a bit sceptical towards e-learning and ICT applications in the education. Some of them are already participating in major European partnerships, but general co-operating activities are still lagging behind the first three groups.

European VCT outlook – country examples

In this section we will provide some regional setting and country examples which may describe the recent e-Learning settings in Europe. This description is based on an analysis and report on use of synchronous e-Learning systems in Europe, which was provided by the European Socrates/Minerva project, called "*Virtual Classrooms in educational provisions – synchronous e-Learning systems for European Institutions"*.

The focus of this report was to establish data on the knowledge of and use of 'live e-learning systems' in European university and corporate institutions. This would then be used as the context for analyses of the didactic advantages and the economic viability of the systems. This would be followed by the development of model courses, of a manual of good practice and other recommendations for European trainers and training systems.

In the next few pages we try to collect some interesting cases, examples from the international cases. In some content we add findings from other project findings (HIBUS, Germany) to get a more detailed view on the certain country or region.

Central and Eastern Europe

Analysis of facilitating and inhibiting factors

The Central and Eastern European region covered by our survey has a cultural background involving historic interconnections with the German culture. This characteristic certainly influences the propensity to take up new technologies like VCT.

In the following, we are going to summarize the possible cultural barriers of the spread of VCT systems. This section is based on work by [Hofstede][4] also referred to in [Biró at.al.][5].

The analysed countries are on the individualistic side of the individualism-collectivism dimension of national cultures which would facilitate the take up of VCT systems. There are however other factors listed below which are rather inhibitors.

The most important one is uncertainty avoidance which inhibits changes in well established processes. Education in these countries has a strong tradition showing many successes in the past, and by consequent actively or passively opposing forces of change, even if these changes have to take place sooner or later due to the progress of the devlopment of information society and the accompanying increase in the demand for education.

Another important inhibiting factor is the short term cost inefficiency of VCT systems. VCT requires considerable investment at startup, on which there is a return most of the time only if savings are realized on either traveling or time spent out of work. Since the analysed Central and Eastern European countries are relatively small, travel costs are not considerable. Time spent out of work is definitely considered by multinational companies on the other hand, which are sensitive to ROI.

The relatively low penetration and the high cost of Internet in Central and Eastern European countries is a factor which cannot be neglected either, strongly inhibiting the spread of VCT especially in public education services. In-house corporate education shows more promise on the other hand.

General market evaluation of the e-learning systems in the Central and Eastern European region[6]

Besides the global challenges listed above, human resource development systems and organizations in Eastern and Central Europe have to face nowadays special tasks in serving their societies. EDEN`s Strategy stated in this respect:

> In rapidly changing societies, such as in Central and Eastern Europe, the need to expand student numbers, retrain employees and educate people for democracy and social-political involvement provide good prospects for the wide scale introduction and development of open and distance learning. This is also reflected in most of the newly developed educational policies in the region and demonstrated in a number of international assistance programmes as well as local efforts.

The main challenges, which human resource development spheres of the countries of the CEE region are confronting are as follows:

Access: a basic shortcoming of higher education and, more generally post-secondary education in Central and Eastern European countries is its inability to open up to larger parts of the population. A particular bottleneck is presented by traditional, full-time education establishments which are characterised by a weak infrastructure;

Flexibility and diversity: another common problem is the inability of systems to adapt to the needs of rapidly changing economies. The traditional, academically-oriented, long-cycle type of higher education is not flexible enough to accommodate the new need for professionals. It could be said that the more rapidly an economy and society change, the more justified it is to introduce short-cycle post-secondary education. This kind of job market-oriented, professional education is largely missing in the countries of Central and Eastern Europe;

Continuing education: a further common shortcoming in the region is the non-existence or outdatedness of adult education in its various forms and at various levels. The adaptation of distance education for continuing education could be an effective way to supplement professional knowledge which has become obsolete,

Transfer of new knowledge and skills: the ongoing economic, social and political changes in this region need the enhancement and development of the transfer of relevant knowledge and skills to the wide population and the strengthening of the European dimension of education: languages, European studies, management, business administration, environment, social studies, political sciences, advanced technologies, etc.. This need can not be met in the short and medium term in the frame of traditional educational systems.

Distance education has a role to play in addressing the major issues described above, contributing to the re-structuring and further development of the educational systems and responding to the needs of socio-economic development in Eastern-Central Europe.

The development of distance education in Central and Eastern Europe offers an exceptional challenge and opportunity for the large-scale implementation of new methods and structures, initiating processes which can then play a determining role in the development and transformation of not only the educational systems, but - through the intensive multiplication effect of modern training methods, combined with the latest information technologies and telecommunication - also for the societies and economies themselves. As up-to-date open and distance learning is hardly present in the countries concerned, the establishment of basic national structures, the development of national policies, and the creation of the physical and human infrastructure for distance education development is in most cases accomplished in a situation, in which the steps taken can and in most cases certainly will determine basically the direction and extent of future developments.

The rapid and positive change of appreciation of open and distance learning, mainly due to the development of the application of advanced information

technology and the evolution of the concept of the information society, has interestingly coincided with the rapid development of open and distance learning in Central and Eastern Europe.

Germany

The use of VCT in Germany is described in the terms "still very little" and "restricted". There is no VCT applications which can be called best-known. E-Learning-on-Tap and Horizon Live seems to be unknown. Applications like WebEx, CuSeeMe from WhitePine and NOVA Syncobox from NOVA and Evolearning complete this list.

In Germany the deciding points about implementing an e-learning application is the interactivity and the networking of students and the quick and inexpensive connection of virtual teams. The training content can be provided permanent and short-term. Other mentioned advantages are the feedback opportunities, the control mechanism and the use for greater target groups too. The reduction of travelling time and costs are further advantages.

Among the disadvantages the German institutions enlist the technical restrictions and missing knowledge on the part of the learners and the promoter. Problems cause the security demands and the low stability of the systems during the sessions. As financial aspect the relative high starting investment is mentioned.

From the students point of view e-Learning in Germany has started to become well known in the last years. According to the HISBUS study, in 2000 only 34% of the students knew something about or studied with e-Learning applications. In 2003 this number increased to 84%, which seem to be a good achievement, but knowing something about these application and using them is a different issue. Only 23% of the students participated in any e-Learning lecture. The role of the virtual laboratories is still quite minor. On the other hand the students, in average, spend 19%-of their whole studying time with browsing on-line teaching content.

If we want to summarise the current situation in Germany, then we have to say that on the one hand VCT seems well known, but not often used. Successful use of VCT is at the moment restricted to special arrangements for special target groups or, in the case of a software company, for communication and knowledge-flow of the employees.

On the other hand, it seems that e-learning is getting more and more integrated into the student’s everyday life. But it is still not good enough to make ICT supported education more popular. The usage of the virtual learning environments heavily depends on the integration of the e-learning applications into the compulsory curriculum.

Scandinavia

Among the Scandinavian respondents we find representatives from all of the following groups:

- No knowledge of VCT, no present use in the organisation, no plans for using it (Some respondents in this group failed to return the questionnaire for this reason.)
- Knowledge of VCT, no present use in the organisation, no plans for using it
- Knowledge of VCT, no present use in the organisation, planning to use in the near future
- Knowledge of VCT and present use in the organisation

There are no obvious differences between the Scandinavian countries in respect of the answers to our research questions. Centra seems to be the tool most applied among the organisations we contacted, but it does not control the market.
Companies or educational institutions with information technology among their business or research areas are not necessarily pioneers at the use of VCT in their internal training. On the large, the most advanced users of VCT seem to be found among corporate institutions and not among universities and research institutes

Norway

In Norwegian universities and colleges, efforts in the direction of establishing virtual classrooms seem to be strongly influenced by the introduction and use of LMS'.The majority of these institutions already make use of a LMS, whereas the rest is about to choose one. *ClassFronter* (http://www.fronter.no) is by far the most widespread system. *It'sLearning* and *BlackBoard* are used by some institutions, including two of the biggest universities, and a couple of institutions are about to choose a LMS.

The LMS' in question are not designed for synchronous e-learning, with the exception of BlackBoard. The general impression is that synchronous e-learning is initiated by individual members of staff who perceive it as useful in their own teaching, and who make use of available technology such as videoconferencing and chat for this purpose.

ClassFronter has no audio / speech transmission except for a possibility for storing audio files. The system supports chat and collective writing, i.e. users having access to a common document, each user writing his paragraph, with the possibility to comment on others' writing, which may be combined in two separate windows. The developer, Fronter AS, has gained a market share in the other Scandinavian countries also. Their representative explained that there is

little demand for functionality for synchronous e-learning including audio transmission. The technology exists, but universities are limited by economic constraints and do not give preference to acquiring costly equipment for this purpose. Much of students' work is done on private computers, the standard of which depends on students' private economy.

BlackBoard integrates virtual classroom technology in its new version. The respondent from a large private university contends that the system, whilst extensive, is somewhat inflexible and difficult to tailor to the school's specific needs, The VC functionality is not used by the school. Some teachers do however make use of chat as a means for implementing synchronous learning in their classes.

The respondent from the university states in the questionnaire:

> *"The closest we get to your definition of VC is our long experience in using:*
>
> - *video-conferences supported by electronic classrooms (discussion groups and small group areas), and*
> - *a pilot using real time lectures supported by online discussion groups."*

Sweden

A leading Swedish university specialising in IT was contacted. They participate in international research on e-learning which means their respondent is a well-informed source on e-learning in Sweden. He is aware of VCT technology and perceives what he denotes the 'non-synchronous virtual classroom' as the most interesting e-learning alternative in their institution. He describes it as 'a supplement to the physical classroom; an extra dimension'. About the use of VCT or related solutions, he adds:

> *"In each corridor there is an enthusiast testing different things in his courses."*

Even if the university does not employ technology that falls under the VCT definition of our project, they have since -95/-96 arranged courses over distance at up to 3 sites simultaneously, with video and audio transmission. ". In the questionnaire, they explain as follows:

> *We use several different systems, from Lotus to FirstClass for asynchronous contacts and also several in-house applications for distributing of materials and discussions, virtual seminars. We also have an in-house system for synchronous teaching with video + audio two-way communication.*

On this background, the university respondent chose to redefine VCT to comprise 'asynchronous communication involving modalities from text to video' when answering the questions about advantages, disadvantages, dissemination in Sweden and future use in the institution of VCT technology: Advantages offered by VCT (as defined by the respondent) are seen to be its role as 'a complement to the real classroom.' A disadvantage is, in his opinion, that the technical level is still too complicated for the average teacher. The use of VCT (as defined by the respondent) is widespread in Sweden, and he believes that his university will use this kind of technology more and more in the future.

Conclusions

The view that virtual classroom systems (VCT), or live e-learning or synchronous e-learning systems, are little known and little used in Europe at the moment, but mostly everyone know the importance of this issue. Usage was not really widespread with few institutions using VCT for formal education and training. In those institutions and countries where an attempt to measure the presence of virtual classroom systems in education and training provision the figure given was less than 5%[7] It appeared that institutions that were already using the systems would continue to do so.

Universities also realised the necessity of establishing European-wide research networks, and most of them started to collect partners (private and public organisations as well) not only form their home countries, but from several other European countries as well. Even the universities with the worst evaluation of ICT skills started to develop these connections, even if these partnerships are still quite week.

Universities are also quite enthusiastic in making plans, and strategies about the ICT use in the academic and the supplementary education, but this can't be really seen on the amount of classes held in virtual classrooms. Even in the western European countries, where these technologies are quite well known and adopted by mostly all the institutions in higher education, the usage is still lagging behind the goals of the implemented strategy.

Footnotes

[1] Decision No 2318/2003/EC of the European Parliament and of the Council of 5 December 2003

[2] Based on: FVU (2003): *The Strategy of the Finnish Virtual University,* www.virtuaaliyliopisto.fi/data/files/strategia/FVU-strategy.pdf

[3] Source: Studies in the Context of the E-learning Initiative: Virtual Models of European Universities (Lot 1), 2004

[4] Hofstede, G. (1994). *Cultures and Organizations, Software of the Mind: Intercultural Cooperation and its Importance for Survival*, McGraw-Hill, London, 1994.

[5] Biró,M; Messnarz,R; Davison,A.G. *The Impact of National Cultural Factors on the Effectiveness of Process Improvement Methods: The Third Dimension*. Software Quality Professional (ASQ~American Society for Quality) Vol.4, Issue 4 (September 2002) pp.34-41.
(http://www.asq.org/pub/sqp/past/vol4_issue4/biro.html)

[6] Prof. Tamás Lajos *The role of advanced information technology in the development of distance education networks in Central and Eastern Europe*

[7] Source: European Socrates/Minerva project: *"Virtual Classrooms in educational provisions – synchronous e-Learning systems for European Institutions"*.

References

BIRÓ,M; MESSNARZ,R; DAVISON,A.G. (2002): *The Impact of National Cultural Factors on the Effectiveness of Process Improvement Methods: The Third Dimension. Software Quality Professional* (ASQ~American Society for Quality) Vol.4, Issue 4 (September 2002) pp.34-41.
http://www.asq.org/pub/sqp/past/vol4_issue4/biro.html
downloaded: 03/03/2005

BOEZEROOY, GORISSEN (2003): *Dutch e-Learning in Europe, ICT and Education,*
www.surf.nl/en/publications, downloaded: 05/03/2005

DECISION No 2318/2003/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL(2003), Official Journal of the European Union

EUROPEAN SOCRATES/MINERVA PROJECT, *"VIRTUAL CLASSROOMS IN EDUCATIONAL PROVISIONS – SYNCHRONOUS E-LEARNING SYSTEMS FOR EUROPEAN INSTITUTIONS"* (2004): Analysis and report on use of synchronous e-Learning systems in Europe
http://learning.ericsson.net/virtual/docs/workpackage2.doc

FLYNN, PERKINS, ZIJDERVELD (2003): *Cultural Considerations for Successful International Events,* www.centra.com, downloaded: 05/03/2005

FVU (2003): *The Strategy of the Finnish Virtual University,*
www.virtuaaliyliopisto.fi/data/files/strategia/FVU-strategy.pdf
downloaded: 08/03/2005

HOFSTEDE, G. (1994). *Cultures and Organizations, Software of the Mind: Intercultural Cooperation and its Importance for Survival*, McGraw-Hill, London, 1994.

KLEIMANN, WEBER, WILLIGE (2005): E-*Learning aus Sicht der Studierenden*, In: HISBUS online panel Kurzbericht Nr.10, Hannover http://www.his.de/Abt2/Hisbus/HISBUS_E-Learning10.02.2005.pdf downloaded: 25/04/2005

MTA INFORMÁCIÓTECHNOLÓGIAI ALAPÍTVÁNY (2004): *E-learning lehetőségek a hazai felsőoktatási reform megvalósításában*, Budapest

PETTERSON, LIMBEEK (2002): *Design of a virtual clasroom*, The 34th Annual Conference of the International Visual Literacy Association, Breckenridge

PLS RAMBOLL MANAGEMENT A/S (2004): *Studies in the Context of the E-learning Initiative: Virtual Models of European Universities (Lot 1)* www.uc.cl/campusvirtualuc/documentos/virtual_models.pdf downloaded: 08/03/2005

Chapter 10

Success stories and Testimonials

Desmond Keegan

This chapter gives a listing of success stories and of testimonials on the success of synchronous elearning systems in various countries. These are presented to show examples of this form of elearning at work in education and training provision today.

The experiences presented are:

- California State University, Chico
- Trinity College Dublin, Ireland
- Sligo Institute of Technology, Ireland
- Corvinus University of Budapest, Hungary
- Ericsson Education Ireland
- Palomar College, California
- Minnesota State University Moorehead
- Washington State School for the Blind
- Adecco

California State University, Chico

California State University (CSU), Chico offers a diverse curriculum to its primarily 18-24 year old population, but its acclaimed academic reputation stems in part from the fact that it has been in the business of delivering distance education throughout California for over 30 years to students whose average age is 38. In fact, the University has seen its diverse distance education programs serve over 17,000 students, many of who live north of Chico's campus in an area roughly the size of Ohio.

With so many students miles away from campus, Chico relied on microwave and satellite technology to deliver its distance classes, but in 1998 it began to look at the Internet as a potential means of saving money while still being able

to deliver the same high-quality, lifelike courses its students have grown to expect. In 1999, after a rigorous evaluation process of companies offering web-based course delivery products, Chico selected Horizon Wimba's Live Classroom to be its live synchronous course provider. Upon successfully introducing Live Classroom in the Spring 2001 semester when it offered 27 courses entirely live online, Chico has relied on Live Classroom to offer more than 200 live and archived classes – more than 7,500 hours of live online instruction – to more than 1,000 distance learning students.

Background

Throughout the 1990's, CSU, Chico transitioned all of its ITFS programs to satellite, but in 1998 it began to explore ways it could offer its satellite-based classes over the Internet. After forming a search committee and conducting interviews and rigorous product evaluations, Chico selected Horizon Wimba's Live Classroom (at the time named 'HorizonLive') from more than 10 other synchronous providers such as Centra, Placeware, and Interwise. Chico chose Live Classroom to be its sole synchronous course solution for a number reasons, but primarily because of its low-bandwith requirements, thin-client, automatic archiving, and the ability to run on both PC's and Macs.

After a strong history of conducting satellite-based courses, the satellite system at CSU, Chico "went dark" in January 2001 and was replaced by a combination of live and on-demand web-based systems, with the winning technology mix being the integration of WebCT and Horizon Wimba. The combination of these two technology systems resulted in the marriage of the best live and self-study tools rolled into one web-based solution. By facilitating dialogue, collaboration, and personal sharing, Horizon Wimba's Live Classroom – in conjunction with WebCT's course tools – helped establish a sense of community and connection among distance students that could not otherwise exist in a purely asynchronous online environment.

During the initial transition in 2000, more than 150 students willingly participated in 500+ hours of live Internet classes delivered via Horizon Wimba. And to demonstrate the ease of which the live classroom and WebCT were implemented, classes as diverse as computer science, education, psychology, political science, and sociology were not only been taught by "early adopters," but by faculty who considered themselves to be "average technology users."

Program Profile

- CSU, Chico's Distance Learning program includes one Masters degree, four Bachelors completion degrees, five minors, and five certificates
- More than 200 live courses have been delivered since 2001
- 22 self-paced Computer Science courses are offered as archived classes each semester
- More than 200 courses and 7,500 hours of instruction have been delivered

- More than 100 instructors have participated
- More than 1,000 students have participated
- 99% of students were “satisfied” or “very satisfied” with their experiences online in 2004, as compared to 86% of students in 2001

The Benefits of Adding Horizon Wimba’s Live Classroom to Course Management Systems

Though course management systems are terrific tools for tracking lessons, creating syllabi, posting information on message boards or via e-mail, and delivering homework assignments, they lack the true live, interactive component that is so essential to teaching and learning. Because course managements are strictly self-paced, students aren’t able to ask questions or communicate with their classmates at times when they need feedback. And this is where the live classroom naturally fits.

Horizon’s Wimba Live Classroom’s functionality picks up where CMS’s leave off. By retaining many of the same elements of a face-to-face classroom, Live Classroom allows faculty and students to build relationships by combining state-of-the-art interactive technologies such as voice, video, application sharing, polling, and whiteboarding, with traditional best practices of instruction. Live Classroom enables institutions to offer the best elements of face-to-face and online instruction, as faculty and students can talk to each other, express emotion, and feel as if they’re part of a single community.

With Live Classroom, faculty can:

- Create a sense of community among students and instructors who might not otherwise interact with one another
- Offer live classes, office hours, and group discussions at times that are convenient for instructors and students, not just when the physical facilities are available
- Ensure students understand their lessons by asking for immediate feedback, answering questions, and giving in-depth verbal explanations of complex material
- Enable students to meet their developmental objectives by appealing to different learning styles, as many students are auditory and visual learners
- Have fun: The best instructors and most memorable lectures invariably mix elements of education and entertainment – seeing, talking, laughing, and joking are all parts of the education process

A Unique Faculty Training & Support Program

Most faculty become proficient with Live Classroom within a few hours, and it is this simplicity and ease-of-use which has enabled more than the 100 professors at CSU, Chico to use Live Classroom as an integral part of their teaching. Even

while using this new technology, it takes faculty approximately the same amount of time to prepare for online classes as it does to prepare for a traditional face-to-face class.

Despite Live Classroom's intuitive interface, before a faculty member even gets to the classroom, he or she is invited to participate in training programs on Horizon Wimba and WebCT systems. However, what's novel about this training program is that the lessons focus on instructional design principles that will get results and excite their students. Because much of online learning still remains uncharted territory, many faculty members are not familiar with the subtle techniques that will keep their students engaged and excited about a class while they're seated at their computers. Chico's faculty trainers recommend hints such as asking more questions and offering frequent polls or surveys, as more interactivity will keep a student's attention and inevitably lead to higher retention rates.

To ensure classroom efficiency, the training and support team at CSU, Chico created a model that should be emulated by colleges and universities nationwide. This model provides that each faculty user be supplied with a student technology assistant. These student assistants monitor chat discussions as the instructor teaches, assists with the delivery of Web-based content and prompts the instructor when a student poses a particularly timely or important question or comment, thus enabling the instructor to focus on teaching the course material while not having to be less concerned with interrupting a class by having to manage the technology.

Inside the Classroom

Since 2001, there have been a number of instructional approaches that Chico professors typically utilize. The most common is a 'hybrid' model in which students log in to a live class from their homes or offices throughout Northern California, while on-campus students actually sit in the physical classroom. By logging into a live, face-to-face class, the remote students inherently feel much more a part of the campus community. Often these classes provide a live video stream of the professor, with the video streams typically being received by students on dial-up modems. This low-bandwidth friendliness is an essential feature of the live classes, as many remote regions remain years away from getting high-speed internet access. Additionally, and just as importantly, the live video reinforces the ability to create an online community. Chico operates two Internet origination classrooms which include seating for more than 20 on-campus students with button-actuated microphones and cameras. These students interact with the instructor as in a typical face-to-face classroom and can see class content displayed on TV monitors and a computer data projector at the front of the room.

The instructor leads the class session from a podium equipped with a PC and a Wacom display that allows easy delivery of course content and on-screen annotations with the Horizon Wimba eBoard. A student assistant is stationed beside the podium ready to assist with content delivery and student interaction whenever needed.

Anywhere from 3 to 50 online students may participate in any given live class. They can communicate with the instructor using Live Classroom's chat or polling tools, or by calling in directly by phone. Though geographically dispersed, the online students in these courses feel as if they're an important part of the Chico community. Additionally, Chico staff also use Horizon Wimba to meet virtually with colleagues at other California campuses and to conduct seminars on emerging technology and technology issues.

What the faculty say

"We are able to reach a group of students that we would not be able to normally reach."

-Tony Waters, Assistant Professor of Sociology

"We have the ear of the Horizon Wimba staff at every level, from technical support all the way up to the CEO." - Bill Evans, Manager for Distributed Learning Technologies

What the students say

"Because of the distance I live from the campus – 120 miles – Live Classroom and WebCT provide the perfect answer for me. I must admit that it is more than I ever expected it could be. It got me thinking in totally new and different ways. The way the course was delivered was as good, if not better than, an on-campus class. I would recommend this class to all my colleagues. Thanks so much for this class."

Trinity College, Dublin, Ireland

This case study details the real experience with the use of eLearning in Trinity College, Dublin. Trinity College is a traditional university founded in 1592. The students selected to participate in this experience are mature, average age 30 years, and are pursuing their careers during the day while attending University in the evening**.**

The objectives of the research were

- To see if eLearning can play an effective role in the traditional University
- To introduce on-line, synchronous, interactive elearning
- To use elearning techniques to assist the non-traditional learner
- To establish the effectiveness of remotely located lecturers teaching remotely located students using 56k modems

Introduction

A consortium of nine major ICT companies, (BT, Cisco Systems, IBM Europe, Intel, Microsoft Europe, Nokia, Philips Semiconductors, Siemens AG, Thales), and EICTA, the European Information, Communications and Consumer Electronics Industry Technology Association, has been exploring new ways of addressing the perceived ICT skills shortage in Europe. The consortium is supported by the European Commission.

The focus of this case study is on the delivery of online synchronous learning using a web-based collaborative platform with non-traditional learners at First Cycle Degree level.

Approach

The GENIUS project was implemented in Trinity College in an ongoing class situation with a group of 49 students. The students were pursuing a course in Enterprise Computing and it was felt that the inclusion of partial eLearning content would enhance the learning experience.

Research instruments were issued before and after the experience, which elicited both quantitative and qualitative results, which informed the project.

Part-time evening study at Trinity College

Trinity College[3] is a traditional university, established in 1592. Located in Dublin city in the Republic of Ireland, it has a current student body of approximately 15,000. The Computer Science Department within the university, which is associated with this initiative, is the largest department of its kind in Ireland. Established in 1967, this department facilitates learning for c. 1300 students at both First Cycle Degree and Second Cycle Degree level.

An estimated 750 of these students are non-traditional learners, average age twenty-nine years, in full-time employment attending college by night. It is from this body of students that the described project was managed and administered; specifically a selected cohort of 49 students was drawn.

The Department of Computer Science at Trinity College places particular focus on Continuous Professional Development, Second Chance Education and Lifelong Learning and is committed to producing high calibre graduates sought by industry, the professions, public service and academia. The cohort of 49 students specified are following a degree programme of study in the area of Information Systems over five years. Typically, the students work full-time and attend college for three evenings each week over the academic year. The programme is fee-paying with a considerable number of students receiving subsidies from their employers. In some cases, a small tax exemption applies.

Scope/Aims

The challenge of this project was to facilitate the student to take lectures on campus, at workplace and/or in his/her own home with the following aims and objectives:

- To develop and deliver online, synchronous, interactive eLearning via the Internet
- To discover if elearning can pay an effective role in the traditional University
- To assess the impact of the new pedagogical approach
- To use elearning techniques to assist the non-traditional learner
- To establish the effectiveness of remotely located lecturers teaching remotely located students using 56k modems

Within these aims and objectives a complex set of success criteria evolved:

Success Criteria

- Delivery of synchronous online lectures in two phases
- Facilitation of students' technical requirements
- Training of students, lecturers and support staff to facilitate the experience
- Supporting students and lecturers throughout project
- Engaging students in a critical assessment of the pedagogical approach
- Meeting the normal academic requirements e.g. examination/learning etc.
- Evaluation of the experience

The University of Dublin, Trinity College, carried full academic, technical and administrative responsibility for the project from commencement to closure. Resources were sought and drafted over the course of the project in respect of these considerations. Observing the rigours of academia, the team

concurred that issues of access and ethics should be observed throughout the project. At the outset, it was agreed that regular project meetings would be held at the same time each week with roles and responsibilities assigned relevant to the tasks in hand.

Pre Delivery

Technical staff and team members attended training days in the use of the web-based platform. Team members developed a strong working knowledge of the web-based platform by self-training, peer to peer training and trial and error. This was essential to the further successful training of lecturers and students.

Emerging from this training, it was evident that this new pedagogical approach required a departure from the conventional role of the lecturer to a collaborative working relationship with team members and technical staff associated with the project.

At this point, selection of the student cohort was critical and was dependent on the suitability of the subject area to the new medium, co-operation from the lecturer/s associated with the subject area and student numbers registered on the course. Other issues such as number of licenses available, technical facilities available at the University and available funding for the project were also key considerations to further developments. Issues of access and ethics were also noted. Within all these considerations the course ‘IT and the Enterprise’ presented as most appropriate.

The focus moved to the role of the lecturer and the challenge here was to replace the conventional lecture with a new medium of teaching and learning. The first hurdle was to understand the demands of this new pedagogical approach and to identify the commitment necessary to embark on training for the technical and pedagogical execution of the project. The timing of the training of the lecturer was structured close to the delivery of the on-line lectures. This was important in the context of the possibility of the loss of skills acquired in the use of the technology to support delivery.

Initially, the lecturer was given a guided tour of the web-based platform together with some preliminary training. This facilitated familiarity with the new medium and the various functions within. Subsequently, the lecturer engaged in self-training and was facilitated with peer-to-peer training thus acquiring knowledge and confidence in the system. The team members worked collaboratively throughout this training. Several test sessions were held and from this experience most difficulties for the execution of the synchronous elearning experience were anticipated. The team confidently progressed to working with the students in the knowledge that the experiment was properly managed, tested and supported. The team agreed that a tighter focus on an interactive style of delivery of course material was essential to the success of the new medium.

At this stage all technical and operational issues were examined which included identification and procurement of necessary resources. A server was purchased to facilitate the project and technical support sought to enable the registration of students including passwords, photographs etc. A set number of licenses were available for use, however, due to the large numbers of students concerned, further licenses were sought and purchased to facilitate the project.

Delivery

The lectures were delivered on schedule. For the duration of the project, students received the lectures from a variety of locations, at home, at place of work and on the university campus. The on-line lectures were independently recorded within the facility of the web-based platform. During this time academic, technical and administrative assistance was provided for both students and lecturer. A 'Helpline' remained open to facilitate students. Activity on the server was also monitored during this time. Following each lecture, the team discussed pedagogical, technical and administrative issues and where possible sought to improve the educational experience for all concerned during the following on-line lectures.

Post Delivery

All concerned engaged in an evaluation of the experience comprising questionnaires, interviews, discussions, observations and focus groups, which elicited quantitative and qualitative results. Qualitative data arising from students' work through a set assignment and questionnaire issued at the end of this experiment provided a critical appraisal of the use and potential use of this technology and new pedagogical approach. Recordings of lectures and details of the log analysis provided further quantitative and qualitative data.

Conclusions and Insights

The students at the centre of this project believe that on-line synchronous eLearning with the use of audio and still image has a role at the traditional University level for the non-traditional learner. However, students noted that not all subjects were suited and favoured a blended approach to this learning. Bandwidth and sound quality presented as issues of concern. In particular, bandwidth presented as a national issue that had potential for improvement through time and political intervention. Results also demonstrated that the pedagogy was in its infancy and that further work would be necessary to refine models for future implementation. Students attributed in large part the success of the project to its timely management and organization.

The lecturer concluded that the approach was a most useful one requiring a serious commitment to training with great potential for use on other courses. A strong interest in developing research in the field was highlighted, particularly in the area of pedagogical development and intellectual property rights.

From the organizational perspective it can be concluded that the non-traditional learners were comfortable with this new medium of learning. It can also be concluded that a serious commitment to this pedagogical approach requires detailed planning at both strategic and operational levels. The commitment to planning and development requires a substantial investment in training. It also requires a deep commitment by lecturers, students, technical and administrative staff to embrace these developments. Political issues, at local, national and international levels can also serve to support such initiatives. Intellectual property rights also need to be addressed as an issue within this context.
Models have yet to be developed to maximize such an investment. The cost of licensing surrounding this type of collaborative web-based platform still remains outside the remit of educational establishments and an economic scaleable proposition must be considered as a way forward.

Above all, an imbued culture of organizational change is paramount to the success of the adoption and expansion abroad of this pedagogical development.

Sligo Institute of Technology, Sligo, Ireland

IT Sligo is a small third level educational college in rural Ireland. Having recognised that online learning was increasing the market size for distance education, we felt that it represented an opportunity to sell niche programmes, in which we considered ourselves national leaders, to a wider audience. Staff in the School of Engineering identified a particular programme in Quality Management as having significant potential, however, no funds were available for the development of content.

With the limited experience of the developer in teaching traditional distance learning in environmental science and having taken a number of asynchronous discussion based courses, he felt that it would be possible to develop a programme without the development of materials. The design could be describde as being “Independent Learning” with added “Internet Support” and followed these general principles:

- Learning would be wrapped around existing textbooks, lecturers notes and handouts, and third party web based materials.
- Learners were required to carry out activities using these resources and submit work regularly to lecturers for feedback.
- Learners had access to lecturer and peer support via document posting and asynchronous discussion areas in a Virtual Learning Environment.
- Face-to-face attendance was to be minimized. It was expected that this would be required for laboratory work and for tutorials on mathematical topics.

The programme consisted of three types of topics: management, technology and mathematics. The delivery commenced based on the above approach with a limited amount of success. The techniques were very successful for the management topics and quite successful for the technology topics. However, the mathematical topics were posing a problem. Learners were

finding it very difficult to cover these topics independently. They felt that the length of time between face-to-face tutorials was too long to make good progress with these topics. Towards the end of the first year of delivery a synchronous teaching system was introduced. The response from learners was extremely positive. From that point on, weekly live tutorials were held online in mathematical topics. Learners remarked that they were able to work much more efficiently, coming to terms with mathematical topics in a faster time, and developing an understanding of issues that they would otherwise not be able to do in the time available.
The use of a synchronous system became standard for mathematical topics from the second year of delivery. Only about 50% of the registered learners are able to attend live sessions, but they are all quite satisfied with using archives of the live sessions when they cannot attend.

In hindsight, IT Sligo are satisfied that the low cost approach taken to the development and delivery of online distance learning has worked and are now launching a number of other programmes following this approach. However, it was the addition of synchronous teaching to the original concept that has made it successful. We intend, for the moment, to keep to the original idea of not developing traditional or any multimedia content. However, we believe that archived synchronous classes will effective act as a very cheap form of rapidly developed multi-media content which can be built up gradually over a number of years.

Corvinus University of Budapest, Hungary

The centre of the e-learning activities of Corvinus University of Budapest (CUB) is the Department of Information Systems. The department is well experienced in using e-learning applications in higher education as the first implementations arrived to the department at the end of the last decade. These applications were successfully adopted into the everyday education in the beginning of the new century. The first platform was Learning Space, a Lotus Notes based application, which had been used for almost 5 years, when the other Lotus application, QuickPlace was introduced instead.

Right now,almost all students of the department use these asynchronous software. We have 60 enrolled CUB students each year in the Information Management major, who are using continuously the QuickPlace platform. During the fall semester, the department has a compulsory class (Information Science at the Organisations) for all the business students of CUB, which means almost 600 students, who have to deal with e-Learning software. Furthermore some partner universities are also interested in the e-Learning services of our Department. The first partner, who uses these applications, is the University Selye (US) in Slovakia. Throughout a common program (Information Management major) 25 students access the asynchronous e-Learning services.

The first synchronous e-learning platform was introduced five years ago. The Department participated in a research project, where the main objective was to find an effective educational service for the local cable TV networks, which

provided Internet access to their customers. The application Centra was introduced to reach the aims of the project, but later it was successfully implemented into the everyday educational activities. Right now there are several distance education courses, which are conducted by the Centra system. There are two regular sessions at the moment. One is the joint Information Management program of CUB and US, where the lecturers of CUB are using the virtual learning environment to deliver courses for Slovakian students. The other one is a CUB e-learning thesis-seminar, where the 5-10 CUB students get deeper knowledge about the recent e-Learning methodology and practice, using the software available at the department. Above this, there are occasional courses, project meetings, distance discussions, when the usage of Centra system makes the communication fluent, cheap, transparent and above all quite efficient. According to the feedback from our students and partners, the introduction of the synchronous e-learning application is considered to be one of our success stories.

If we sum up all the trainings, vocational education at our department, all the synchronous and asynchronous e-learning activities, we can say that almost 1000 students use the Department's e-Learning facilities each year. If we also consider, that the CUB Faculty of Business Administration has 3800[10] Students, than we can say that more than 25% of the business students experienced and used e-Learning applications in practice.

If we calculate an e-Learning access ratio for all the students at the CUB, than the outcome is not that bright anymore. Altogether 16 000 students are enrolled to the CUB, which means that only a bit more than 6%-of them have the chance to access an e-Learning platform. Nevertheless, this small number shows what challenges the CUB Department of Information Systems has to face in the future.

Ericsson Education Ireland

Ericsson has been using the Centra, Virtual Classroom application for approximately five years. Within Ericsson,the Education group is one of the biggest application users – here it is used for a variety of purposes including; internal staff meetings, product updates and launches, internal and end customer staff training etc.

In this report we focus on a recent Instructor Led Training (ILT) delivery performed by an Ericsson instructor to students working in Belgium for one of that countries leading telecoms companies.

End customer training is facilitated as our Centra virtual classroom server has been co-located on the Internet and Intranet. The course, delivered by a Dublin based instructor was part of a blended learning solution involving the used of asynchronous eLearning and synchronous instructor led training delivered via the virtual classroom.

The asynchronous web based content included in the blended learning solution consisted of datacoms related eLearning material which the participants accessed over a period of four weeks. The second component, instructor led datacoms training was delivered using virtual classroom technologies delivered after the access to the asynchronous material was completed and the goal of the session was to answer any questions that arose from the asynchronous material and to further the students datacoms knowledge, through the teaching of new concepts.

This second delivery method provided distinct advantages. The principal advantage being the cost-effectiveness of the solution. This is particularly relevant for an organisation who wish to deliver only a small number of Virtual Classroom courses and who therefore could not justify the cost of purchasing and hosting their own Virtual Classroom server. Another plus for this system is that it is relatively easy to set up users from both the students and instructors organisations, whilst at the same time maintaining the security and integrity of the material hosted. The final and most important benefit of using the virtual classroom system is that it leads to huge cost savings for those involved as costs associated with travel and hotel expenses can be eliminated.

Overall this delivery method has opened up numerous possibilities for both Ericsson companies and our customers and will undoubtedly be built upon to create huge savings, innovation and business opportunities.

In conclusion, it appears that the synchronous virtual classroom, once considered ‘the technology of the future’ is now very much established as an integral part of Ericsson Education’s Blended product portfolio – over the past twelve months alone usage of our system has grown by 100%!

Palomar College, California The California Community College system is the largest system of higher education in the world with 109 colleges, 2.9 million students and 85,000 faculty and administrators. Due to its immense infrastructure, the system has myriad state-wide committees that regularly meet multiple times each year to discuss topics ranging from human resources policy, to finance, to network security, to faculty development.

Through 2002, the system required members from each committee to drive from their respective campuses to various meeting locations throughout California – locations that could be hundreds of miles away which incurred high travel costs to the system and asked each committee member to spend significant time away from their own offices.

In 2001, the Chancellor's Office of the California Community College awarded a grant to Palomar College to deploy a technology that would enable faculty and administration to conduct virtual meetings, thereby eliminating the need to travel around the state. In 2002, after a rigorous RFP process, Horizon Wimba’s Live Classroom (then called ‘HorizonLive’) was selected as the underlying technology to power CCC Confer, the branded communication tool

that has been deployed across the community college system's faculty and administration.

Horizon Wimba Live Classroom's accessibility features were the key differentiator in the decision-making process, as these features enabled persons with disabilities to participate in a similar fashion to those without disabilities. Now, the ability to conduct virtual meetings, deliver presentations, share software programs, and collaborate on a whiteboard make the California Community College System's faculty and administrators more productive and cost-conscious, while Live Classroom's accessibility features ensure that all constituent demands are met.

Through Summer 2004, CCC Confer has conducted thousands of hours of live and archived online meetings and continues to increase usage and utilization as more and more faculty and administrators are exposed to the technology. CCC Confer plans include expansion from powering virtual meetings to delivering instructor-led, live, online distance education at many of its 109 community college campuses.

The CCC Confer project is located at Palomar College in San Marcos, California and is funded from a grant from the California Community Colleges Chancellor's Office. The project was initially funded in February 2001 in order to offer the CCC system a viable means to meet and collaborate at a distance. CCC Confer is led by a Project Director, three managers and a small staff. In 2002, an RFP was awarded to HorizonLive, a New York-based leader in Web conferencing technology, to provide the platform to power CCC Confer. CCC Confer was designed to allow communication and collaboration, using the latest Web conferencing technology, for all staff, faculty and administrators in the California Community Colleges system.

In the context of such a large system, faculty and staff in general found themselves spending a significant amount of time traveling between campuses to attend committee meetings and participate on various task forces. The Chancellor's Office of the California Community College to address the problem awarded a grant to Palomar College to deploy a technology that would enable faculty and administration to conduct virtual meetings thereby eliminating the need to travel around the state.

In 2002, after a Request For Proposals (RFP) process, HorizonWimba was selected as the underlying technology to power CCC Confer, the branded communication tool that has been deployed across the community colleges faculty and administration. The system's accessibility features for people with disabilities was apparently seen as a key differentiator in the decision-making process, ensuring that all constituent demands are met. Future plans for the system in the overall state-wide organisation include expansion from powering more virtual meetings to delivering instructor-led, live, online distance education.

Minnessota State University Moorehead

Minnesota State University Moorhead have chosen the HorizonWimba VCT system to be the foundation of its fast-growing distance education program. Rhonda Ficek, Director of Instructional Technology at Minnesota State University Moorhead, is quoted as summarising the motivation to choose the system as follows: “Students like online courses but they also like to be face-to-face with their teachers and classmates, and Horizon Wimba’s Live Classroom will allow us to do both – to teach in a variety of combinations that will suit all our students.” The Live Classroom product was selected, it is said, because its minimal requirements (students only need an internet connection, speakers, and a microphone) make it significantly more accessible than other collaboration technologies.

In terms of roll-out plans it is apparently envisioned that classes will use the system to provide optional synchronous meetings for online courses at first. After this when the faculty become skilled with the techniques for synchronous online instruction, it is anticipated that there will be required meetings each semester (perhaps one per week or one every other week). This will allow instructors to "gauge the pulse of the class" while also being able to more accurately measure their students' progress and subject matter comprehension. Ficek believes that real-time interaction will provide instructors with a truer representation of their students' progress.

MSUM will add Live Classroom to its expanding online curriculum, including Nursing, Education, Business, and Technology classes.

Washington State School for the Blind

The issue of accessibility was high on the agenda when Washington State School for the Blind decided in June 2004 to use HorizonWimba OpenRoom for their Accessible Online Curriculum. The system is used to enable visually impaired students throughout Washington to actively participate in classes, ranging from Adapted Mathematics to Music Braille, they wouldn’t otherwise be able to take locally. Additionally Washington State School for the Blind (WSSB) will offer a series of faculty development courses to staff state-wide, a number of whom are visually impaired themselves, enabling these instructors to improve upon their own skill sets, thereby embodying this project as they will experience the online courses from both the instructor and student perspectives. Robb Peck, Director of Distance Education of the WSSB, is quoted as saying “We wanted a solution that could easily accommodate the unique needs of both our faculty and students, and now, thanks to HorizonWimba, we can proceed full-steam ahead without having to make dramatic changes to our instructors’ methods of teaching or to our students’ ways of learning.”

Adecco

The world's largest temporary staffing firm, Adecco, with 28,000 employees scattered across 5,800 offices in 68 countries who annually place over 4,000,000 into temporary positions at hundreds of thousands of companies around the world has recently adopted synchronous e-learning. Up until 2001, Adecco relied on traditional face-to-face training for this large and disparate workforce but, faced with mounting costs, Adecco began to search for a training solution that would reduce the costs associated with the time and travel involved with traditional face-to-face training yet still constitute an effective delivery method.

Adecco selected Horizon Wimba to train its dispersed workforce on Expert - the company's proprietary skills testing application that checks hundreds of thousands of potential temporary employee's skillsets before they are placed into a job. Adecco trainers are able to teach Expert by specifically using Horizon Wimba's application sharing feature, a tool that enables a trainer to open Expert on his computer and work on that application in real-time while those logged on remotely follow along with the trainer's keystrokes and mouse movements. "Horizon Wimba has become an integral part of our blended solution. It gives us the speed to get our messages out to our workforce and gives us flexibility we never had before," Adecco's Harvey Menden, Director of Learning Strategy is quoted as saying: "Horizon Wimba has given us an extra edge."

Reference

Audrey Jennings, Catherine O'Connor, Dudley Dolan, Alan Mullally (2003) *Experience in the use of synchronous elearning in a traditional university for non-traditional learners*. Proceedings of the ILTA Conference, Tralee, Ireland, June 2003

Chapter 11

Summary and conclusions

Desmond Keegan

European Commission documentation

Since the year 2000 the European Commission has invested largely and produced a great deal of documentation on elearning. See http://europa.eu.int/comm/education/programmes/elearning/programme_en.html

Major documents include:

- Directorate General for Education and Culture, *Future Trends in e-Learning Technologies* **(**11 Apr 2005)
- Commission Staff Working Paper: *eLearning : Designing Tomorrow's Education - A Mid-Term Report*
- Decision of the European Parliament and of the Council, adopting a multi-annual programme (2004 to 2006) for the effective integration of information and communication technologies (ICT) in education and training systems in Europe (eLearning Programme)(5 December 2003)
- *The elearning Action Plan – Designing tomorrow's education* (3 March 2001)
- Communication from the Commission, e*Learning - Designing tomorrow's education* (May 2000)

A careful analysis of this documentation leads to the conclusion that it is entirely, or nearly entirely, focused on what one might refer to as 'traditional elearning', the type of learning in which students are taught as individuals, placed in front of a computer which is running Learning Management System software of the type developed by WebCT or Blackboard.

There is very little reference to synchronous elearning systems (or Live elearning or Virtual Classrooms) which function with groups of students being taught simultaneously at different locations around the globe using

appropriate software designed by groups like Centra, Horizon Wimba, SumTotal, LearnLinc, Interwise, or Elluminate.

One of the problems is that the European Commission came late to elearning.

The first documents come from 2000, from the then Commissioner, Viviane Reding, and talk of the need to 'catch up' with development in elearning on the other side of the Atlantic.

The problem with this is that by 2000 the major trends in elearning were already in place. North American groups had designed the first Learning Management Systems and market leadership had already been won by WebCT and Blackboard.

By 2000 major decisions had already been taken about the pedagogical structuring of elearning materials and decisions had already been made on the inclusion of pedagogical ideas that were not central to European university education like the templating of content, quizzing, multiple choice questioning, chatting, reusable learning objects.

Also by 2000 decisions had already been made on elearning standards, with developments like SCORM, IMS and others.

Purpose of this book

One of the purposes of this book is to draw attention to a lacuna in European elearning knowledge and provision.

In the United States elearning can refer either to individual-based elearning or group-based elearning. In Europe the group-based systems are little known and little used.

The major United States corporate elearning analyst, Bersin and Associates from Oakland, California, group elearning systems under the headings 'Self Study' and 'Live' which clearly demonstrates the characteristics of the two systems. They list major providers as:

- *Self Study Tools*: Macromedia Breeze (http://www.macromedia.com), Articulate (http://www.articulate-online.com/), Brainshark (http://www.brainshark.com/), CourseAvenue (http://www.courseavenue.com/), DirectWeb (http://www.directweb.com/), Learn.com (http://www.learn.com/), ReadyGo (www.readygo.com),Macromedia Captivate (www.macromedia.com), Trivantis Lectora (www.trivantis.com),Outstart Trainersoft (www.outstart.com) .
- *Live*: iLinc (www.ilinc.com),Centra (http://www.centra.com/), Interwise (http://www.interwise.com/), LearnLinc/iLinc, Macromedia Breeze Live (http://www.macromedia.com/), WebEx (www.webex.com) and IBM Lotus Virtual Classroom (http://www.lotus.com/).

Research reported on in Chapter 1 of this book demonstrates conclusively that synchronous elearning systems are little known and little used in Europe. One of the difficulties of conducting the research was that the European elearning experts contacted did not understand what was being referred to in the research and lengthy explanations were needed to explain to these elearning experts the characteristics of the systems being investigated and how they differed from 'traditional' elearning.

In the light of the extensive documentation on elearning from the European Commission referred to above, this is a serious lacuna. It means that a whole dimension of elearning, as it is understood in the United States, is little known and little used in Europe.

Another purpose of this book is to contribute to the literature of synchronous elearning systems. A careful search on Google and other sources has revealed little analytical publication on these systems.

There are, it is true, publications from the major providers of synchronous systems. But these are promotional and system specific. What is lacking is a scientific overview of the field of provision as a whole from a neutral standpoint.

This book seeks to address these weaknesses in the literature in two ways:

- Providing information on synchronous elearning systems and how they differ from face-to-face provision, 'traditional' elearning and other forms of provision with which they may be confused
- Providing a Manual of Good Practice for European trainers and training organizations and others who may wish to embrace this form of provision.

Providing information

Providing information on synchronous elearning systems and how they differ from other forms of provision is the subject of Chapters 1, 9, 10 and 11.

Chapter 1 provides an overview of knowledge and use of virtual classrooms systems in Europe. It gives an introduction to the book and contains an overview of the software and vendors for virtual classrooms. It deals with how virtual classrooms differ from ILT (Instructor Led Training), video conferencing and traditional eLearning.

Chapter 9 deals with running virtual classrooms vvents in a Higher Education Institution in Europe. In spite of the documentation provided in this book on the lack of knowledge of and the lack of use of synchronous elearning systems in Europe, this chapter details the remarkable use of these systems by the Corvinus University of Budapest, often with unusually large groupings of students and as part of programmes accredited at university level, in a different country – with transmissions taking place from Hungary to Slovakia.

Chapter 10 is a series of success stories and testimonials. These are taken from both United States and European sources and provide details for the readership of successful implementation in a range of didactical situations.

Chapter 11 is this chapter on summary and conclusions.

Providing a Manual of Good Practice

Chapters 2 to 8 take the form of a Manual of Good Practice. The purpose is to provide authoritative guidance for European trainers and training organisations which wish to embark on this form of education and training provision.

Chapter 2 deals with pedagogical issues. It outlines the advantages and some disadvantages of synchronous elearning systems, highlights their similarities with face-to-face and elearning provision and gives advice on how to deal with the pedagogical issues of using these systems.
Chapter 3 is about session set-up. It deals with the issues to be considered when setting up sessions. These include scheduling sessions, enrolling new and existing users in sessions, notifying participants, checking access privileges and storyboarding for teacher preparation.

Chapter 4 is on content design issues. It includes considerations when designing a session, running a pilot, rapid content development involving the use of templates and storyboards, how to structure sessions and the production and realisation of a lesson.

Chapter 5 has as its title ‘Leading an online event’. It focuses on icons and tools available to session leaders, i.e. user and leader icons, using web safaris, application sharing, breakout sessions, evaluations and quizzes and text chat.

Chapter 6 is ‘Promoting Interactivity’. It includes information on various student learning styles and how these can be accommodated within the confines of the synchronous virtual classroom applications. Key points on how to promote interactivity are discussed.

Chapter 7 is on evaluation and assessment. It details the use of evaluation and assessment strategies used in virtual classrooms and presents the technologies available for this such as quizzing and polling, audio-based assessment, video-based assessment, authentic assessment, assessment and chat and the archiving of assessment.

Chapter 8 is Blended Learning - this chapter provides suggestions on how the various synchronous and asynchronous learning methods can be combined to maximise the pedagogical and economic results.

European usage

In spite of the finding that synchronous elearning systems are little known and little used by European trainers and training organizations, the project has been able to discover excellent examples of the use of these systems in Europe.

Corvinus University of Budapest in Hungary, using the Centra system, has made extensive use of this form of provision. What is important about the Corvinus usage is that it is at higher education level, that the numbers are large and that it is an international usage to students in Slovakia.

The first synchronous e-learning platform was introduced by the Department of Information Sciences at Corvinus University of Budapest (CUB) five years ago. The Department participated in a research project, where the main objective was to find an effective educational service for the local cable TV networks, which provided Internet access to their customers. The application Centra was introduced to reach the aims of the project, but later it was successfully implemented into the everyday educational activities. Right now there are several distance education courses, which are conducted by the Centra system.

There are two regular sessions at the moment. One is the joint Information Management program of CUB and the University Selye (US) in Slovakia, where the lecturers of CUB are using the virtual learning environment to deliver courses for Slovakian students. The other one is a CUB e-learning thesis-seminar, where the 5-10 CUB students get deeper knowledge about the recent e-Learning methodology and practice, using the software available at the department. Above this, there are occasional courses, project meetings, distance discussions, when the usage of Centra system makes the communication fluent, cheap, transparent and above all quite efficient. According to the feedback from our students and partners, the introduction of the synchronous e-learning application is considered to be one of our success stories.

Much of the data on synchronous elearning usage comes from training systems in the United States. The Corvinus experience, on the other hand, is of usage in degree programmes in a European university. The data presented in this book is that Corvinus has shown that these systems can contribute in an important way to higher education programmes.

Many of the training systems using synchronous elearning are for small groups of students, often less that ten. Corvinus has shown how these systems can be successful with student groupings of 50-60. Furthermore in the Corvinus case the students are in another country where there are large groupings of Hungarian students who are enrolled for degree programmes at the Corvinus University in Budapest.

Another example of European usage is from Ericsson Education Ireland. In this case synchronous elearning is used for telecommunications courses for

students from all over the world, most of whom have degrees in engineering, computing or telecommunications. These courses use the Centra system, they are delivered to groupings of students – usually less than 10 – and Ericsson has been using the Centra, Virtual Classroom application for approximately five years to present parts of or whole modules in telecommunications courses. Within Ericsson,the Education group is one of the biggest application users – here it is used for a variety of purposes including; internal staff meetings, product updates and launches, internal and end customer staff training etc.

Here we focus on a recent Instructor Led Training (ILT) delivery performed by an Ericsson instructor to students working in Belgium for one of that countries leading telecoms companies.

End customer training is facilitated as our Centra virtual classroom server is has been co-located on the Internet and Intranet. The course, delivered by a Dublin based instructor was part of a blended learning solution involving the used of asynchronous eLearning and synchronous instructor led training delivered via the virtual classroom.

The asynchronous web based content included in the blended learning solution consisted of datacoms related eLearning material which the participants accessed over a period of four weeks. The second component, instructor led datacoms training was delivered using virtual classroom technologies was delivered after the access to the asynchronous material was completed and the goal of the session was to answer any questions that arose from the asynchronous material and to further the students datacoms knowledge, through the teaching of new concepts.

This second delivery method provided distinct advantages. The principal advantage being the cost-effectiveness of the solution. This is particularly relevant for an organisation who wish to deliver only a small number of Virtual Classroom courses and who therefore could not justify the cost of purchasing and hosting their own Virtual Classroom server. Another plus for this system is that it is relatively easy to set up users from both the students and instructors organisations, whilst at the same time maintaining the security and integrity of the material hosted. The final and most important benefit of using the virtual classroom system is that it leads to huge cost savings for those involved as costs associated with travel and hotel expenses can be eliminated.

Overall this delivery method has opened up numerous possibilities for both Ericsson companies and our customers and will undoubtedly be built upon to create huge savings, innovation and business opportunities.

In conclusion, it appears that the synchronous virtual classroom, once considered ‘the technology of the future’ is now very much established as an integral part of Ericsson Education’s Blended product portfolio – over the past twelve months alone usage of our system has grown by 100%!

Conclusions

The conclusions of this study may be summarized thus:

Conclusion 1. The idea that synchronous elearning systems are little **known** in Europe is strongly supported by the evidence presented in Chapter 1.

Conclusion 2. The idea that synchronous elearning systems are little **used** in Europe is strongly supported by the evidence presented in Chapter 1.

Conclusion 3. The view that the copious European Commission documentation on elearning makes little reference to synchronous elearning systems is supported.

Conclusion 4. The usage of these systems for training in the United States is demonstrated by the case studies presented in the book.

Conclusion 5. This is further underlined by the development by major providers of Learning Management Systems (LMSs) or Virtual Learning Environments (VLEs) of synchronous elearning systems to meet the needs of the market as Blackboard has done or of alliances with providers of synchronous elearning systems as WebCT has done.

Conclusion 6. Synchronous elearning systems can be, pedagogically, a valid form of education and training provision.

Conclusion 7. Of particular importance is the reintroduction by these systems of the concept of the class into distance education and elearning contexts.

Conclusion 8. Synchronous elearning systems can be, economically, a valuable form of education and training provision.

Conclusion 9. Studies of Return on Investment (ROI) of these systems demonstrate the economic viability of these systems.

Conclusion 10. It is reasonable to conclude from the evidence provided here that there is a lacuna in European elearning provision.