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HOW TO GO ONLINE: CONSIDERATIONS OF DESIGNING AN ONLINE COURSE - TECHNICAL OPTIONS, DIDACTICAL METHODS AND THE STUDENTS

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Abstract

This paper addresses the task of designing an online course. Which considerations have to be made? Many factors have to be regarded: technical options, the didactical design, the institution, the subject of the courses and the students. This task becomes even more difficult when we get aware that these factors are very much independent and that the decision in one field cannot be made without considering the others aspects.

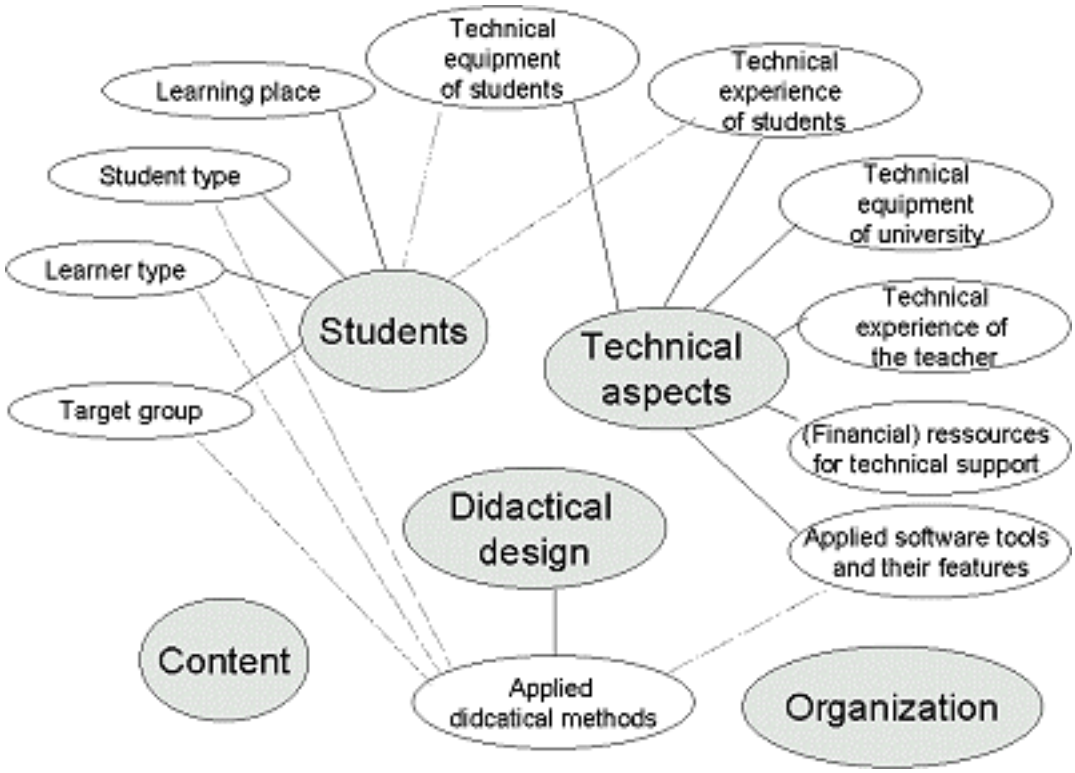
The didactical design of an online course has to be implemented based on technical option in order to shape and support the teaching and learning process. Different internet media can be uses such as web pages, email, discussion boards and chats as well as specialized software packages. These media types are characterized by certain functionalities which are appropriate for certain learning methods. What are the factors which influence this choice? Besides the aspect of synchronization the technical equipment at the learners' place and their media competence is essential. Additionally CD ROMs can be used as a media for data transmission as well as a supportive function for the learning process. The didactical design of a CD ROM can support different learning methods and provide additional learning material which can be used according to the students' demands. In this paper some examples are given as how to implement different didactical elements with different technical features.

The learning process does not have to take place on the level of the individual learner but should integrate social interaction in different social forms. learning can take place on different levels such the individual learner, small groups, and plenary settings. But:: group learning processes have to be properly planned and pre-structured in the didactical design of online courses and need sufficient technical support in order to work properly.

Introduction

When designing an online course several options must be considered: The didactical design, several technical aspects, the organization, the course subject and the students.

Factors which influence the design of online courses



The applied technical functionalities have a major effect on the didactical options. Therefore the didactical methods and the course setting should be designed first. The didactical methods which determine the applied teaching and learning techniques affect the way of interaction among students and teachers as well as the individual and cooperative learning processes. One major challenge is to transfer some of the methods of traditional face-to-face courses into the virtual world and to make use of the new options offered by features of the applied technological platform.

Several questions come up when we take the factor 'students' into consideration: Which is the target group of the online course? Which type of students are involved? Where do students learn? Which learning behavior is applied? Which learner types are involved?

The subject of the course also plays a role in the design of online courses. But since this paper tries to focus on some general considerations which have to made in all types of online courses it will not consider the subject in depth. Nevertheless it is pointed out that in detail different disciplines might create very different requirements for online courses.

The type and culture of the organization has an influence on the didactical methods as well as on the technical options. Financial resources and technical infrastructure are characteristics of the institution which is offering the course. Restrictions might exist such as to what extent fees can be acquired. Technical infrastructure is often not improved just for one single online course. Only within a structural and organizational process online courses can be offered on a larger scale. The target group and the didactical method might be influenced by organizational tradition and reputation. Therefore organizational factors can be a restriction or an advantage for the development of online courses.

First this paper will outline some of the technical features for online courses and look at different aspects of student types. Concerning the didactical design different methods will be presented and how they can be applied within a virtual setting. For a better understanding of some of the aspects finally an example of a virtual tutorial is presented.

The technical choice: Different media for internet based learning

Email, web pages, chats, discussion boards, video conferencing, whiteboards, and special software packages for teleteaching offer a wide variety of functionalities for internet based university teaching. Therefore it is a difficult question for teachers, which functionalities should be used and which didactical elements can be implemented based on which media. Each of these media has special characteristics which help to make a choice and to decide how to combine these technologies in an appropriate way.

First of all they can be distinguished by synchronization: In synchronous media all learners have to be online at the same time, while in an asynchronous mode they enter the common learning environment at different points of time.

Synchronous media:	Chat, video conferencing, whiteboard
Asynchronous media:	Web pages, discussion boards, email

These characteristics substantially influence the decision in which media a virtual course should be implemented: Can the students be online at the same time and how many will participate? The decision does not have to be absolute: synchronous and asynchronous media can be combined. Besides asynchronous discussion boards, 'same-time' meetings can be held on a regular base weekly or just as special events from time to time.

Another major factor which has to be regarded is the equipment available at the students' desktops. In many cases video conferencing tools are not available nor the required band width in order to have a satisfying quality and transmission of the video picture accompanied with sound. Before making the technological choice and deciding upon the technical implementation these considerations must be made!

Not only the technological equipment must be taken into regard but also how the applied technology can be handle. This includes technical installation and usage as well as these capabilities which are often called 'media competence'. The users have to know how to use the different media and have to feel comfortable with communicating through a video camera (here: *webcam*), discussing in chats, or posting messages in discussion boards. The newness of the media and the challenge of using them should not become a bottleneck for the didactical success of the course. Therefore the course should either be based on well known media or an

introduction and sufficient support such as a hotline are provided. Through questionnaires it is possible to screen the students' prior experiences.

Specific software tools combine several or even all of the above describes features. Tools such as *Gentle, WebCT, Lotus Learning Space* and others offer asynchronous and synchronous information and communication tools within one single user interface.

The advantage of these specialized software tools should be obvious: they support the teachers in the implementation of online courses, offer additional features and present the whole courses with online material, discussions groups and further elements within one user friendly interface to the students. But they also have disadvantages: often high costs are involved and the need for continuous technical support. These investments can often only be made by whole departments or universities - not by a single teacher who is offering just one class. In server-client settings students must install a software client at their learning place and the course is not as open as within a standard internet platform.

Meanwhile new features are developed in these tools which support online learning and offer new didactical options: 'Annotations' are remarks which students and teachers can put into online documents. Automatically these remarks are sent to the document's author. Other students can read the annotations, leave comments or answer questions.

Authoring tools play a more and more important role in the development of telelearning software. Teachers who design and plan a course get support while structuring and designing the online documents and setting up additional elements such as discussion boards and chats. A disadvantage of these tools might be that some of them have a certain didactical framework and the teachers are less flexible in their own course design.

Often course administration is done in a traditional way through paper work. But as soon as the target group is not "on campus" anymore and can only be contacted through the internet, online support of course registration and administration becomes essential. Department or university wide telelearning projects must support student registration, administration of different user profiles and interfaces, individual course delivery and different user access rights. One feature can be that students who access an online course get a list of messages, exercises and material they have not read yet as well as a list of what they already have complete. The interface between students and the online course becomes more and more individualized in future - with more student orientation.

Further aspects of internet based learning: the students

The students' equipment, their learning behavior and their motivation as well as their time available for online learning will mainly be influenced by the type of students

who participate. Who is the target group: adult professionals, full time or part time students of one or several universities? A further question should be: why should full time students of one university participate in an online course? In this case higher flexibility of how and when to access a course could be an advantage as well as a reduction of the time spent to get on and off campus. In the example presented in this paper the reduction of commutation time and flexible online access were the main factors local students to participate. Professionals prefer the flexible and decentralized access as well as the opportunity to participate in classes at an university level. Courses within international cooperation such as inter-university classes which attract international and national students can help to improve their intercultural and language skills. And: even the use of the technology itself can increase a course's attractiveness and get students interested!

The various target groups have different motivation and time to participate in online classes. Professionals can be less flexible to participate in face-to-face kick-off meetings, the same accounts for international students who might not be able to travel that far. Full time students have more time and flexibility to participate in face-to-face teams which meet on a regular base than professionals who might prefer individual learning settings.

Depending on the participants different learning places will be used. Professionals might either go online at their desktop in the office or at home. Full time students might have to use local computer pools at their university. Especially in international settings the technology applied in an online course must take into consideration: where and when can students go online? How much time can they spend in a single session? Can they participate at fixed times or do they need flexible schedules with asynchronous meetings?

The students' previous learning experience and socialization results in individual learning behaviors. Do they prefer to study at home or on campus? Do they learn individually or in groups? How do they get started: do they start with reading the study material or do they prefer to have exercises at the beginning of a course or a lecture? Online classes can apply several didactical methods and therefore satisfy different learner types and groups.

Didactical elements

In some of the first online courses huge amounts of written material were put online or video conferencing tools were used to transmit whole lectures. Meanwhile the design of online courses has gone a long path and a wide variety of course types can be found. Virtual seminars often combine group and project work with self learning phases. Virtual tutorials focus on online exercises while virtual lectures often are still based on the provision of written material or videos and complemented by applications for simulation.

In all types of online courses one or several of these didactical elements are applied:

- Provision of written, graphical or video material for self learning processes
- Exercises as self tests or with feedback by teachers and/or other students
- Assignments: papers or projects by individuals or in group work settings
- Simulations in exercises, self tests or for the purpose of visualization in lectures
- Role plays

Material is often distributed in World Wide Web pages or on CD ROMs. Lectures are still transmitted synchronously in video sessions or they get recorded and the sound or video files are made available for online downloads.

Online tests and assignments support the application and transfer of acquired knowledge. Either self test are provided on CD ROMs or in webpages which are linked to databases and automatically give feedback to the students. These kinds of tests can only be applied for very structured knowledge which can be assessed in multiple choice tests. Tests where students write essays need human interaction: here the teacher or tutors have to give feedback. Often these tests are implemented based on web forms which automatically send the results to the responsible teacher or tutor. If the results are published on a webpage - complemented by the feedback - all participants can take advantage of reading and learning from the other students' results. In some cases the results should be published anonymously in order to encourage students to participate.

In most online seminars the students are asked to complete assignments in order to work intensively on one subject. Assignments also help to assess the students learning progress and solve one of the major problems of online courses: how to assess the students results in the internet? One solution can be oral assessments via video conferencing as they are applied at the Fernuniversität Hagen. Efforts within technical research in this area are intensive, but final solutions are not found yet. Therefore a combination of face-to-face assessments and written project work is quite common.

Simulation are used to show interactive models parallel to a video conference, as addition to written material, or to allow students to play around with data material and ist graphical representation. The increasing development and distribution of Java applets fosters the integration of simulations in online teaching and learning.

Discussion boards are an appropriate tool for several purposes: they can support the students' communication among themselves and help to create study groups and student interaction. But often they are not used automatically unless there is a need to participate with comments or questions. Therefore they have to be applied actively and must get integrated into the course. It is helpful to stimulate the discussion with assignments or provoking statements in order to open the debate. These boards can

also be a helpful instrument to support communication processes within groups. For this reason students have to be able to open new discussion groups on their own where the access is restricted to the group members.

Role plays encourage students to apply acquired knowledge in a realistic context. They refer to decision making situations which students might face in their professional life. The integration of a realistic context helps to apply constructivist peadagogical principles into online learning. The role descriptions should be distributed in advance in webpages or in emails in order to allow the students or student groups to prepare their positions. If the debate itself takes place synchronously in chats or video conferences it will be more lively and interactive - but asynchronous discussion boards can be used as well. If the students participate in groups the team members have to be at the same place or need a separate communication channel in order to coordinate their positions in the discussion.

In online courses different social forms can be used: a single learning setting can be followed by online or face-to-face group work and lead into a plenary session within a chat. These forms of social interaction are part of the didactical design and should take into consideration which type of students participate and which technical features are available in order to support the students' interaction at these different levels.

An example for internet based learning: design of a virtual tutorial

This example presents part of the decision process concerning the design of an online course and gives some ideas about the considerations of the practical implementation.

The virtual tutorial was offered in summer 99 to students of the Frankfurt university. Not all of them had online access at home, so students groups were created in order to

- integrate social interaction and cooperative learning processes
- enable every student to participate independent of their own online access
- motivate student participation through creation of teams

The groups were created according to geographical aspects around Frankfurt and technical aspects such as computer equipment, online access and previous experiences.

They had to meet once the week in order to

- work on group assignments such as online tests and project work

- study the material on CD ROMs which were created for each single tutorial
- participate in role plays in weekly chat sessions
- contact their tutors in case of questions and read the feedback on their exercises

Most of the material was distributed on CD ROMs in order to lower online cost and time. Video sequences, self-test, cartoons, riddles, and a huge amount of additional background material were provided on the CD ROMs for each single tutorial week. Beside the CD ROMs webpages were used to announce news, structure the whole course, provide additional information, and offer online tests. Each single tutorial had its own webpage. In order to support the interaction among the student groups and the tutors, each team and tutor were presented online with a picture and a short profile. Each student group had one tutor as a contact person to whom they had to send emails in case of questions. The chat sessions were offered at three evenings every week and were moderated by two tutors. Those tutors who had prepared the learning material and CD ROMs gave feedback to the results of the students' online exercises. Questions and announcement could also be posted in the online discussion board.

The technical platform based on standard internet tools in order to keep participation as open as possible. Through the application of web based tools media breaks could be avoided. Students did not have to install additional software or setup newsgroups, chats or video conferencing tools. Therefore webchats and a webboard were applied instead of IRC or the usenet. An additional restriction was the students' technical equipment: this would not have supported the usage of synchronous video conferences or whiteboards.

In other online courses the technical options had to be adapted according to the equipment of students in Lithuania, Ukraine, and South America. In one case instead of a webchat an Lithuanian IRC server had to be used to enable students in Vilnius and Ukraine to participate. In the same online course webpages had to be offered in two modes: with and without audio files. In each case the technical features of webpages, discussions boards, chats, and other online material was adapted according to the student's technical equipment.

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