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## More than Podcasting: An evaluation of an integrated blended learning scenario

### **Abstract:**

Lecture recordings have been used as a media for teaching purposes for several years at the University of Applied Sciences in \_\_\_\_\_. In the past, different ways of distribution have been investigated. For some reasons podcast proved to be comfortable: From the teachers point of view, providing them is easy; from the students points of view, using them is easy. Therefore a didactical concept for a blended learning approach based on podcasting, virtual examinations and other media has been developed. This concept has been accompanied by intensive research on usability and didactic value of the used media. This article describes the evaluation of this concept from a student's point-of-view.

### **Introduction**

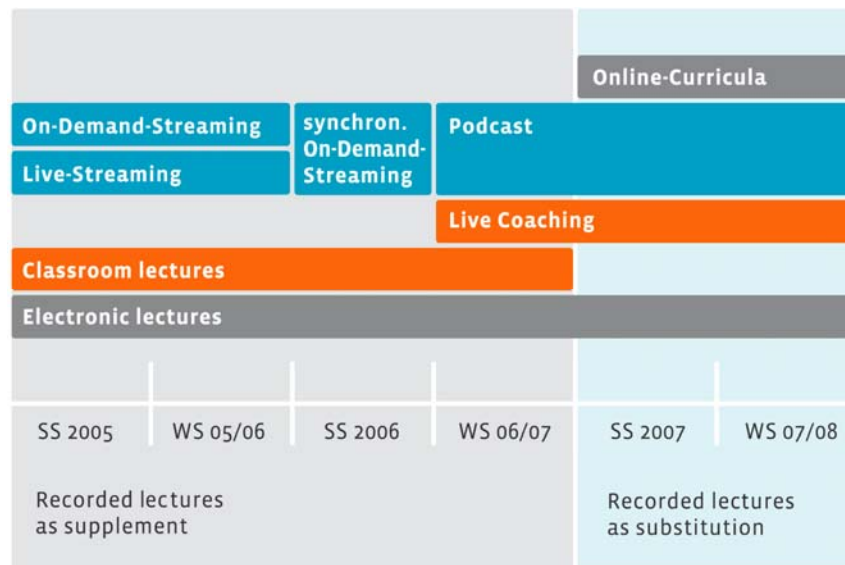
Several universities are working on the integration of lecture recordings in the learning process. Out-of-the-Box solutions for highly automated production and distribution processes are available. Lecture recordings are well known to be a cost efficient way to generate e-learning material and content (Lauer & Ottmann 2002). However, compared to the amount of available production technologies, the ideas for application scenarios of lecture recordings in a university context are rare. Usually these recordings are offered as supplementary content to the students.

In (XYZ1, 2007) a blended learning approach using podcast as an integral part of the didactic concept was presented. Within this concept, the teacher's role in the learning process was changed fundamentally. A teacher should not longer be the "presenter of content" but more a coach who goes along with the students during their learning process. The coach shall give selective input to the students, try to activate the self-learning competence and motivate them.

The structure of this article is as follows. At first we refer to our previous paper (XYZ1, 2007) for Ed-Media 2007 and describe shortly the elements of the didactic concept mentioning how they involve the student's learning process. The innovative part of this paper is presented afterwards. An intensive investigation regarding the lecture-concept has been made. The evaluation approach is described and the results of this evaluation are presented. The paper closes with a conclusion and some final remarks.

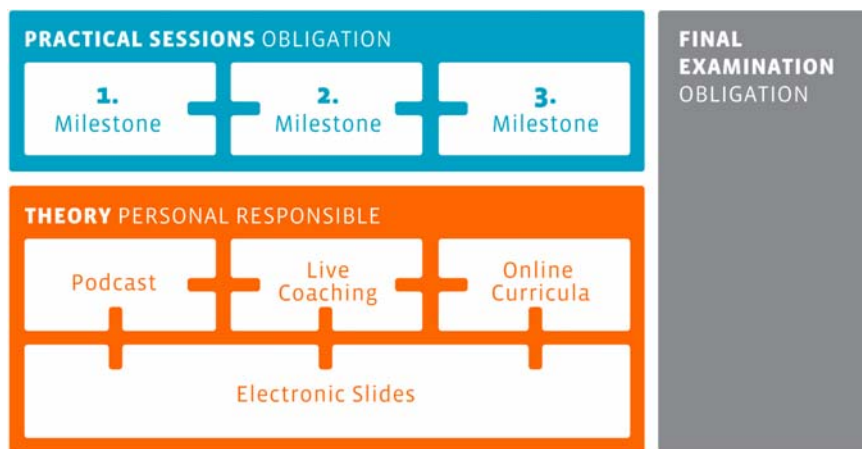
### **A blended learning scenario**

In our previous paper we described the development process of a concept for blended learning based on recorded lectures for a lecture on Audio-&Video-Technology for students of Computer Science. During the last three years different technical approaches of recorded lectures have been tested: Live- and On-demand Video Streaming, Synchronized on-demand Presentation and Podcasting (illustrated in figure 1).



**Figure 1: Development process of technical platforms**

For a certain time the recorded lectures were offered as podcast episodes in addition to the classical lectures. Since 2007 the podcast has completely replaced the classroom lectures. At present, the didactical structure of the current concept combines Podcast-Lectures with Live-Coaching, Online-Curricula and Practical-Sessions to support the students learning process. Figure 2 shows that concept and its inherent possibilities of flexible usage for the students.



**Figure 2: Components of the concept**

The podcast episodes are published in the iTunes Music Store. Therefore the students can access them easily. By means of portable player hardware the learning content can be accessed anytime and anywhere. Electronic annotated slides are available to each of the episodes. They are linked together by integrating the URL of the slide in the podcast.

Every week a meeting with the students and the lecturer is held. However, these meetings are organized not as pure content-presentation-sessions, but are used by means of Live-Coaching to support the student's learning process. Certain aspects of the content are discussed, misunderstandings are clarified and practical issues are introduced. The coaching session also links to the practical part of the lecture. These lab hours take half of the overall work load and are to gain practical experience in video and audio production. The students produce videos and podcasts which consolidate their theoretic background. Certain milestones have to be fulfilled to pass the practical certificate.

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Furthermore an electronic exercise system, the so called Online-Curriculum, is used for several reasons. To each podcast episode a number of questions about the content of that episode are asked. This online examination is an essential part of the concept and an important motivation for the students to work continuously with the podcasts during the semester.

The course finishes with a final examination as a written test of 2 hours which must be passed.

As we announced in the concluding remarks of (XYZ1, 2007) further investigations in that project took place: In winter term 2007/08 different instruments of behavior research were combined to evaluate the concept from a student's point-of-view. In the following we describe the design of the qualitative evaluation and discuss the interpretation of the results. In addition - as a perspective for future enhancements - we critically reflect the usage of the study components with the focus on self-organized learning.

## **Evaluation of the concept**

Our research methodology will be explained here in short terms.

### **Target group**

Currently the evaluated course is offered to students of the discontinued diploma and the bachelor in media informatics. During the semester of research 58 students (20 bachelor, 38 diploma) were attending the class.

### **Questionnaire**

The core content of the questionnaire consisted of ten open and direct complementary sentence questions in polarized form. The same questions were asked in both ways, negative and positive. They are listed below

1. The concept of this class is / is no sense full alternative to the ordinary class, because ...
2. The concept of this class does / does not really, not at all support my learning behavior, because...
3. For me coaching sessions are / are not a relevant part, because ...
4. I make regular / irregular use of the coaching sessions, because ...
5. The podcast given at my disposal I do/ do not use, because...
6. I am / am not capable of following and understanding the contents of the podcast episodes, because ...
7. With the slides given at my disposal I can / can not learn without others help and any difficulties, because ...
8. The electronic test sheets are /are not an important part of the learning environment, because ...
9. If anything is unclear to me concerning the content I can / can not help myself, because ...
10. Generally I do feel /do not really feel at all motivated by the lectures concept, because ...

The introductory part explained the survey and introduced the students into the questionnaire. Afterwards they were asked to complete the sentences.

This way of qualitative questioning avoids influencing through given examples of answers. Furthermore unexpected aspects may be named by the target group. They should raise the level of knowledge concerning the concept of the lecture in broad and detailed ways by means of motivation and attitude towards learning.

The collected answers were analyzed interpretatively. Therefore the student's arguments were classified independently by two persons. Categories were built up in which the arguments have been independently assigned and validated by a third person. This procedure was chosen in order to ensure the objectivity of categorization.

### **Testscenario**

In our usability lab we observed each student while working on an exercise sheet of the online curricula. In order not to hinder the use of electronic learning media the exercise sheet was made available to the students in printed form. The test persons worked 30 minutes on the sheet. Our goal was to filter out characteristics and certain structures of the individual learning strategy. For that the work of the test persons was documented by following means: *personal observation*, *frontal recording* via webcam, *side recording* with a video camera and *analysis of the viewdata* with an

eyetracking system Tobii 1750. The observation and recording of the test persons should lead to insights about the way of working comparing the use of conventional (printed slides/handouts) and digital media.

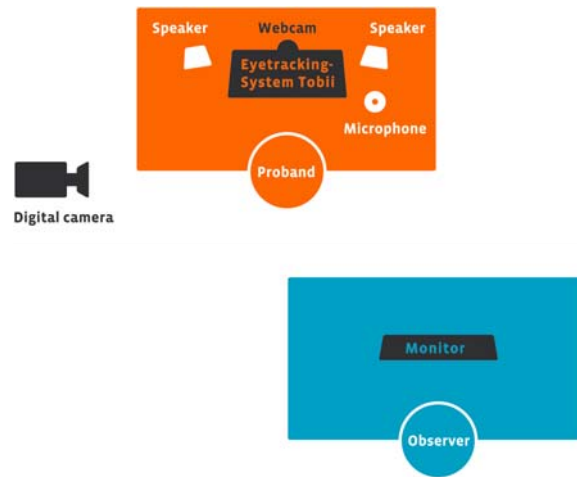


Figure 3: Testscenario

The way of working with the digital media can be differentiated through the analysis of the eyetracking data. The recorded eyetracking shows which media was looked at, which regions have been fixed, which functions of the used learning media came into use, whether the test persons had any difficulties to locate the important contents and how intensively they dealt with the contents of the media.

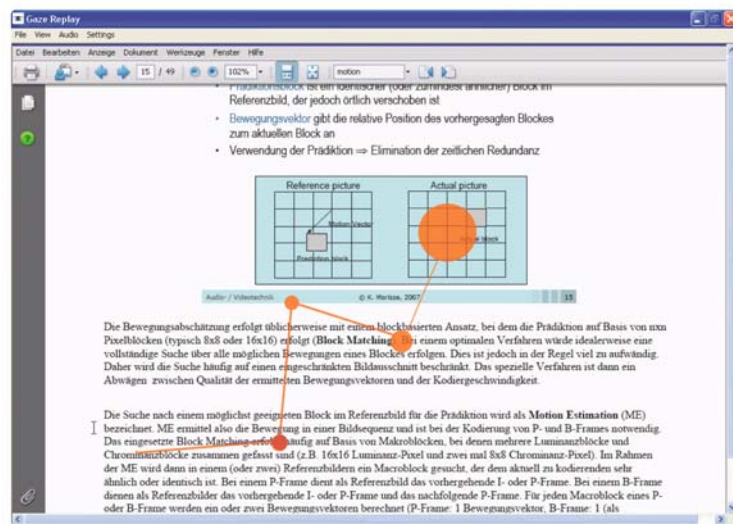


Figure 4: Eyepath

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These eyetracking data have been analyzed interpretatively as well. By means of patterns from eyetracking we separated *reception of information* (reading /figures focused), *interactions* (jumping from one page to the others via table of contents, search functions in one document) and *orientation time* (change between different learning media, visual search in one text).

The view on the exercise sheet and the usage of the printed learning media could be analyzed with the data of the camera and the webcam.

## Results

With the questionnaire data were raised from 24 persons with an average age of 24,5 years. Thirteen of the 24 test persons were also engaged in the second part of the evaluation the supervision scenario. The categories deduced from the evaluation of the questionnaire are the basis for the results presented in this section. A more detailed description of the results can be found in (XYZZ, 2008).

First, we will give some of the results of the recorded working behavior of the students using the available learning media. Then these results are combined with the student's subjective perspectives and will be interpreted as either added value or potentially harmful concerning the use of these teaching methods.

### Usage of learning media in the testscenario

The purpose of the students' observation during the testscenario was to find out in which way they use the learning media in the problem solving context. At first the recorded data showed that while working on the test the slides were used by the students mostly. This fact might be due to the possibilities of the quick navigation and the possibility to do a full text search in the electronic slides. The search function enables the students to find some of the answers to the questions in a very determined way.

Only two persons used the podcast episode. One other person used the audio comments from the podcast. Other services publicly available like Google or Wikipedia do not appear in the chart because almost no use was made of them (see figure 5). So observing how the slides were used made most sense in understanding how contents were realized. Figure 6 shows the analysis of all test persons eye movement behavior. There the eyetracking during the navigation inside the document is called "Navigation". The following search for clues in the text which appears right then is called "Searching in text". The most useful contents for solving each exercise have been filtered step by step. One can realize that charts, lists and pictures in slides get fixed very rarely. During the learning process the graphical examples seemed to be not that helpful. During work with slides most of the time was used for effective reading and so especially helped solving the exercises.

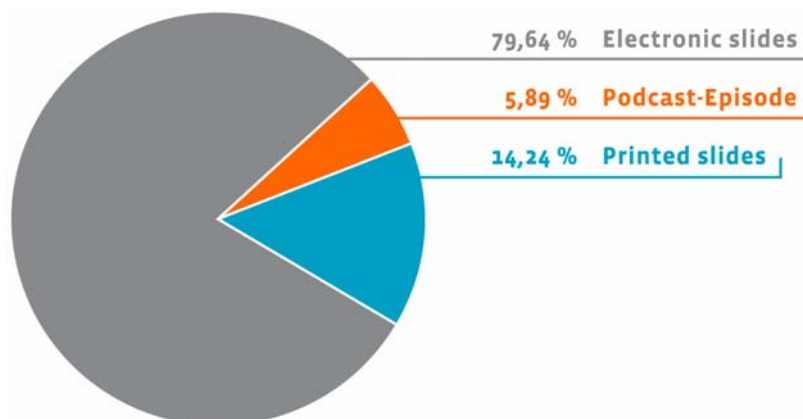


Figure 5: Usage of learning media

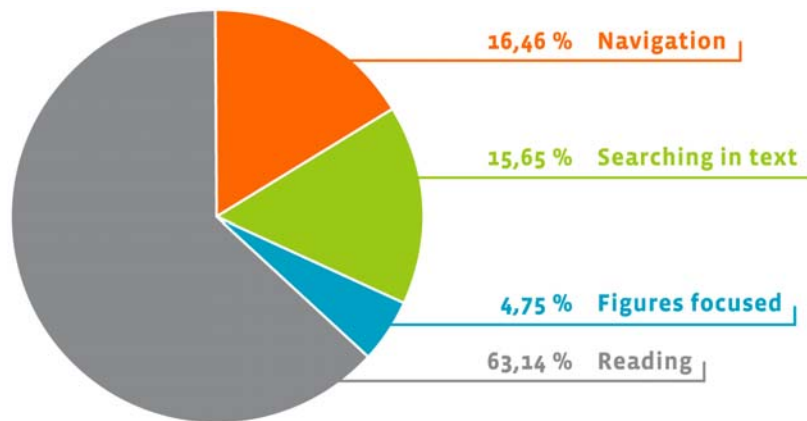


Figure 6: Eyetracking in slides

The results from the testscenario were expanded by the analysis of the questionnaire. Further information on the user's behavior was collected. Though the podcast does not make much sense when being used under time pressure like in the testscenario, demographic data shows its advantages lie in the preparatory stage.

#### Results from the analysis for the lectures concept

Analyzing the conception of sentences in the questionnaire positive arguments concerning the lecture's concept predominate. The following diagram shows the allocation of the positive and negative arguments to the questions from 3.2. Value adding issues as well as dangers of the lecture's concept were realized and summarized below.

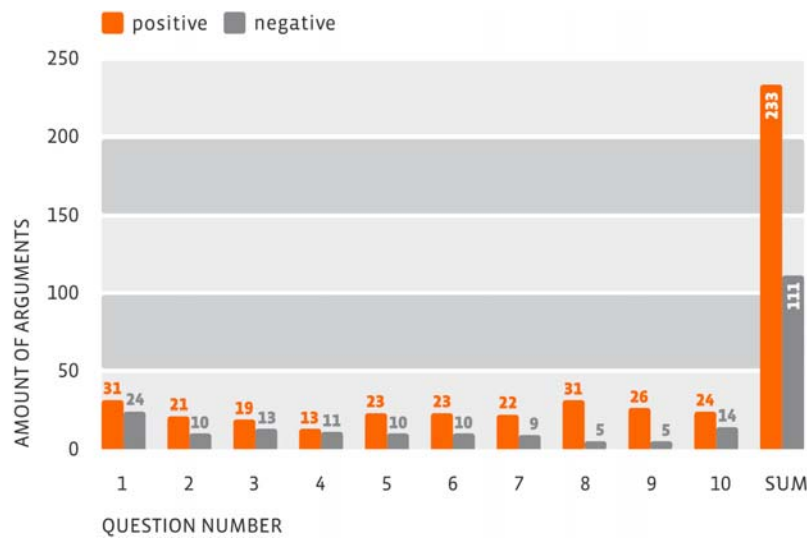


Figure 7: Amount of arguments

**Value adding issues** – One main issue concerning the concept's acceptance is the freedom of choice regarding handling and usage of the learning units. The flexibility of time and place especially guaranteed by the podcast and online curricula but also by practical part which is organized in milestones. Further the repetitiveness as well as the possibility to make breaks in the learning process is counted to be the qualities of the podcast. These aspects enable everyone to individualize his or her learning organization. So the concept enables every single one to decide when, for how long which methods and concepts are to use. The students stressed the advantages of doing research and

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repeating contents parallel, something a classic lecture does not offer. Furthermore the positive values are the supported continuing learning and the offered controls of learning targets. This relates to the online curricula as well as to the coaching sessions. Since confronting with the learning material is necessary in order for an effective use of the coaching sessions, students are engaged in an on-going learning process. Since taking part in the coaching session is voluntary self responsibility has to be taken for granted. That students value self responsibility very positively is an astonishing aspect.

Most of the time problems that arise can be solved with the help of the internet or other media sources. Communication among students as well as the coaching sessions plays another important role in the problem solving process. Other positive comments made on the class are that it's interesting, different and that it motivates the students and therefore improves their learning behavior. Podcast episodes were seen as a good thing in combination with slides – Sometimes even as a substitute for lectures while the use of other sources widens the understanding.

**Dangers** – Many of the negative arguments were basically related to the preference of the classic lecture. One of the main reasons was that questions which arise spontaneously cannot be answered directly by the professor if any questions remain students will have to wait for the next coaching session. So the effect of presenting the special contents at the time of the presentation is missing. An interesting aspect is that even though the lecturer well communicated his willingness to communicate with the students neither the forum for the learning management system or any direct email contact with the lecturer was made use of by any of the students in order to get any help with problems occurring.

But it has to be said that spontaneously arising questions during a classic lecture can in qualitative matters not be compared to questions that can be clarified during coaching sessions. The results of the clarification were brought up by an intensive dealing with the learning contents and therefore stand on a higher level of quality. But for this a higher degree of self-responsibility is needed. It does not surprise that student's value this greater effort regarding self-responsibility negatively. The reasons for this feeling may be due to a certain lack of experience with self-organized learning.

Another point of criticism concerns the online-curriculum. Cheating in the form of simply copying the answers for the exercises from the slides or other sources is viewed negatively as well. Reasons for this cheating are to be found in an under formulated question which makes it harder to find a solution. Not only was the formulation of questions in the online-curriculum but also the quality of the other learning materials criticized. Though it has to be said that this was not really a progressive kind of criticism. There have been few proposals made, how to optimize the podcast episodes. Students suggested that comments like "as you can see" should not be used in the audio comments of the podcast. Also the use of buzzwords should be enforced.

Generally communication seems to be most important when introducing new learning-concepts to give students an overview of the diversity of the learning-media. The learning process needs to be made transparent. Every student should get to know all possibilities the different learning strategies bear and how to make best use of it.

## **Conclusion: Support self-study abilities**

The evaluation has shown that students request self-organized learning but are not necessarily able to manage it. Among others, one reason for this might be found in the study-structure of the university under examination. The curriculum of the study-courses is tightly scheduled to a high degree to allow easy scheduling and therefore provide support for short study-times. Only a tiny program of optional courses is offered. Although this study structure has some advantages (especially from the organizational point of view), though it feeds a lack of interest in course topics beyond the taught content - a precondition for self-organized learning. However, students are not favoring this type of learning-atmosphere where individual interests are difficult to act out. The examined course asks for an extended student-input and this fact is mentioned positively throughout the evaluation. Considering this conclusion in the curricular development process means to deal with the student's desire.

We are convinced that self-organized learning is a basic skill for being successful in business life and to survive intellectually in the modern world. Academic learning in the described manner can provide the students with these abilities when emphasizing their responsibilities. In future progress of the investigated learning-concept we will aim for enhancing this. Regarding this we stated which issues seem to be most important when introducing a new type of

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lecture-concept. It is necessary to explain the usage and the inherent benefits of the choosable course-options. The lecturer needs to act accordingly throughout the semester. Furthermore the offered media must be improved in terms of quality and accessibility and new ways of combining the various information sources should be found.

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