A Mobile Blended Learning Approach based on Podcasts with respect to the Students' Media Literacy*

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Abstract

Since several years lecture recordings have intensively been used as a teaching tool. Several courses are provided with lecture recordings as complementary learning material. Several distribution variants of lecture recordings have been investigated. Podcasts have established as a comfortable distribution technology for lecture recordings and are now established as a regular service for lecturing. This article describes how lecture recordings and podcasts have changed the way of teaching. A blended learning scenario has been set up based on mobile podcast technology. The classical lecture is substituted by coaching sessions, the transfer of knowledge is sourced out of the lecture hall. As a side effect of this didactical concept, the students' competence of self-organization can be enhanced.

1 Introduction

More and more universities are working on the integration of lecture recordings into the learning process. Since 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 [3]. Quite popular are the iTunesU-niversities like Stanford. Lectures from other universities can be found in the Apple iTunes Music Store as a free service. However, compared to the amount of available production technologies, the innovative ideas for application or teaching scenarios of lecture recordings in an university context are rare. Usually these recordings are simply offered as supplementary content to the students.

In this paper we improve a didactical concept presented in [4] and[6]. The blended learning approach uses podcast technology as an integral part of the didactical concept. Within this concept, the teacher's role in the learning process was changed fundamentally: A teacher should not longer be only 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 to work with the contents. However, the competence of self-organization and self-learning isn't a matter of course. It must be trained and needs some motivating activities of the lecturer.

2. Blended Learning Approach

The lecture *Audio- and Videotechnology* regularly given by the first author provides insight in the technical basics of the media types audio and video in the context of computer science. Concurrently to the theoretical part there is a practical part, in which the students have to do some practical work with audio and video, e.g. production of a short movie. Since several years, the lecturer has used different technologies for lecture recordings [4], e.g. Live- and On-demand Video Streaming, Synchronized on-demand Presentation and Podcasting. In the beginning, lecture recordings have been provided supplementary to the classical classroom lecture. Since 2007 the podcasts have completely substituted the classroom lectures. At present, the didactical structure of the current concept combines Podcast-Lectures with Live-Coaching, Online-Exam and practical sessions to support the students learning process. The podcast episodes are published in Apple 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 avail-

able to each of the podcast episodes. They are linked together by integrating the URL of the slide in the corresponding podcast episode.

More detailed, the didactical structure is based on the following building blocks (see figure 1):

2.1. Podcast

There are more than 40 podcast episodes publicly available in Apples iTunes Music Store. The content of these podcasts had been recorded during preceding semesters. However, each recorded lecture has been undergone an intensive postproduction process (chapter marks, dividing into small episodes, integration of animations). They are available anytime and, by using the podcast-format also available anywhere. By using this technology, the learning-process can be self-organized to a high degree. Each episode of the podcast offers a very fine-granulated access to the content by offering chapter-marks and can be used plattform-independent. Each episode includes a reference to a PDF-document with more detailed explanation of the content. There is a defined time schedule how to use the podcast episodes.

2.2. Live-Coaching

Live-Coaching is a weekly meeting of students and lecturer. These meetings are organized not as pure content presentation sessions, but are used by means of Live-Coaching to support the students learning process. Certain aspects of the content are discussed, misunderstandings are clarified and practical issues are introduced. Herein, the students have the possibility to ask content-specific questions to the corresponding episodes of the podcast. If there are too many questions, the content is presented in more detail by the lecturer. The coaching session also links to the practical part of the lecture.

2.3. Online-Examination

To support a continuous learning process of the students, an electronic online examination system is used. Within this system, there are about 10 - 20 questions about the content of each podcast episode or logical block of episodes. During every week the students have to work on one set of questions corresponding to the specific content of that week. This online examination is an essential part of the didactical concept and an important motivation for the students to work continuously with the podcasts during the semester. It is up to their choice, if they process the online exams every week or if they just work on a few of them. However, a bonus system offers a motivation for the students to work continuously with the exams. If they reach more than 50% of the points overall, they can collect bonus points for the final written examination.

2.4. Practical Work

Weekly lab hours accompany the theoretical part of the lecture. Within these part, the students have to work on a media project, e.g. production of a short movie or the production of a podcast. This active learning or learning-by-doing approach strengthens the theoretical facts of the lecture. Usually, this work is done in small groups of up to 3 or 4 students and the result of their work has to be presented at 3 milestones (storyboard, rough cut as a first version, final version of the movie). These lab hours take half of the overall work load and are used to gain practical experience in video and audio production.

2.5. Final Examination

To get the credit points for the module, the final examination, which is usually a written examination, must be passed successfully.

3. Evaluation

This lecture concept has been evaluated during winter term 2007.

3.1. Target Group

Currently the evaluated module is offered as an obligatory course to students in the discontinued diploma study program and the bachelor program in media informatics. Within the diploma program, the module is scheduled in the 6th semester. Within the bachelor program the module is in the 3rd semester. During the evaluated semester 58 students (20 bachelor, 38 diploma) were attending the class.

3.2. Questionnaire

Based on the concepts of grounded theory [1], the core content of the questionnaire consisted of ten open and direct complementary-sentence questions in polarized form. Each question was 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, respectively not at all support my learning behavior, because...
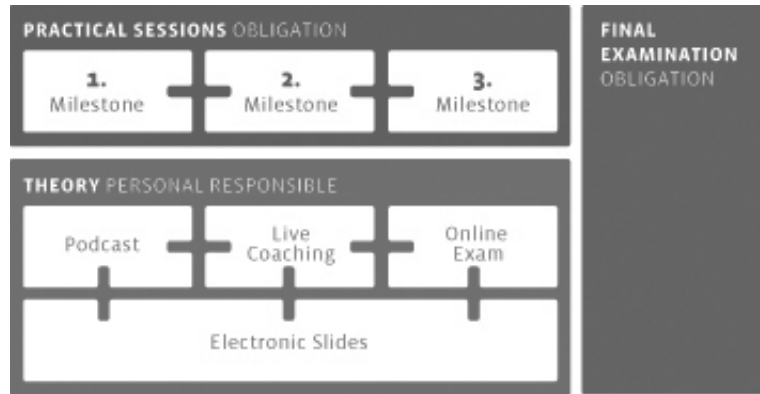
Figure 1. Building Blocks of the didactical concept

3. The coaching sessions are / are not a relevant part to me, because...

4. I make regular / irregular use of the coaching sessions, because...

5. I do / do not use the provided podcast, 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 / cannot 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 / cannot help myself, because...

10. Generally I do / do not feel motivated by the lectures concept, because...

An 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 the test persons 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 students arguments were classified independently by two persons. Categories were built up in which the arguments have been again independently assigned and validated by a third person. This procedure was chosen in order to ensure the objectivity of the categorization.

3.3. Supervision in Usability Lab

In addition to the questionnaire, some of the students have been observed in a usability lab while working on an exercise sheet of the online exam. In order not to hinder the use of electronic learning media the exercise sheet was given to the students in printed form on paper. The test persons worked 30 minutes on the sheet. The goal was to filter out characteristics and certain structures of the individual learning strategy. Therefore 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 view data with an eye tracking system Tobii 1750. The observation and recording of the test persons should lead to insights about the way of working with the provided conventional and digital media.

The way of working with the digital media can be differentiated through the analysis of the eye tracking data. The recorded eye tracking 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. These eye tracking data have been analyzed interpretatively as well. By means of patterns from eye tracking we separated reception of information (reading; figures focused), interactions (jumping from one page to the others via the table of contents; search functions in the document) and orientation time (switch 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.

4. 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 [5].

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

4.1. Usage of learning media in the supervision scenario

The purpose of the students observation during the supervision scenario was to find out in which way they use the learning media in a problem solving context. The recorded data showed that while working on the test the students prefer the electronic slides as information source. This fact might be due to the possibilities of the quick navigation and the possibility to do a full text search in the documents. 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 and 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. Therefore observing how the slides were used made most sense in understanding how contents were realized. One could realize that charts, lists and pictures in the slides get fixed very rarely. During the exercise-solving process the graphical explanation and examples seemed not to be that helpful. During the work with the slides most of the time was used for effective reading, which therefore especially helped solving the exercises.

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

4.2. Results from the analysis regarding the lectures concept

The analysis of the questionnaire from 3.2 shows that positive arguments concerning the lectures concept predominate (see figure 2). Value added issues as well as dangers of the lectures concept were noticed and will be summarized below.

4.3. Value added issues

One main issue concerning the concepts acceptance is the freedom of choice regarding handling and usage of the learning units. The flexibility in learning-time and -place is especially guaranteed by the podcast and online exam but also by the practical part which is organized in several milestones. Furthermore, 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 by deciding where, when, for how long and with which methods learning shall take place. Also the students stressed the advantages of doing research and repeating contents concurrently something a classic lecture does not offer.

Furthermore the positive values are the support of continuous learning and the offered controls of learning targets. This relates to the online exam 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. Participation in the coaching sessions is voluntary, which means that self-responsibility has to be taken for granted. The students valued this aspect quite astonishing very positively.

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 this context. Other positive comments made on the course are that its interesting, different and that it motivates the students and therefore improves their learning behavior. Podcast episodes were judged positively in combination with slides and are sometimes even seen as a substitute for lectures. The use of other information sources widens the understanding.

4.4. Dangers

Many of the negative arguments were basically related to a general preference for the classic lecture style. One of the main reasons was that spontaneous questions couldnt be answered directly by the professor in a recorded lecture context. If any questions remain, students will have to wait for the next coaching session. With this the affect to ask a question at the time of the presentation is missing. An interesting aspect to this is that even though the lecturer well communicated his willingness to communicate with the students neither the offered internet-forum nor any direct email contact with the lecturer was made use of to get help with problems occurring.
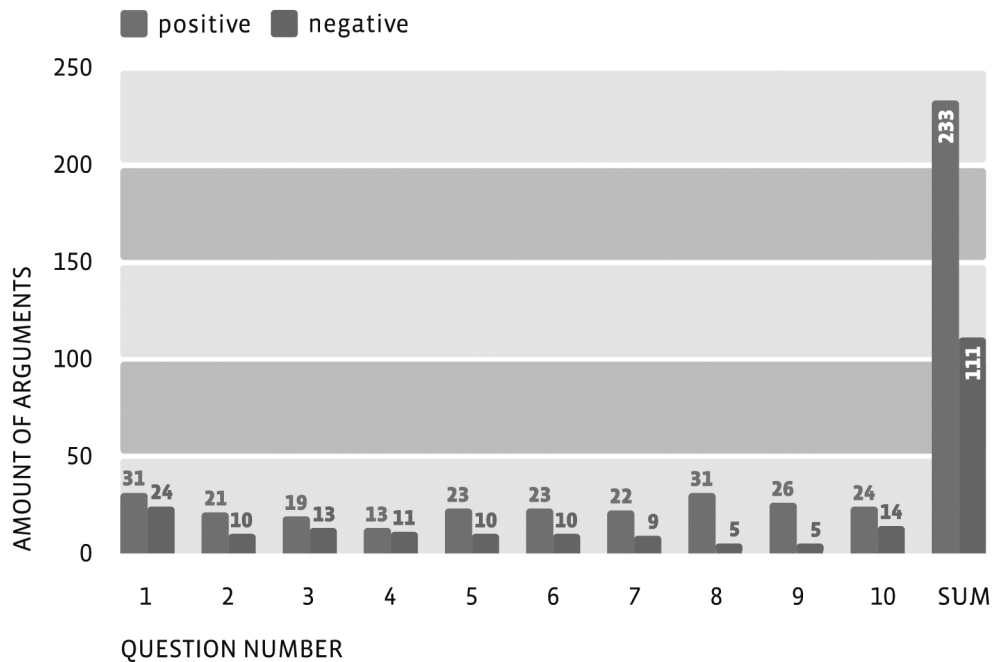
Figure 2. Amount of positive and negative arguments

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, which leads to a greater effort in time compared to classic lecture settings. It does not surprise that the students value this negatively. The reasons for this feeling might be due to a certain lack of experience with self-organized learning.

Another point of criticism concerns the online exams. 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 based on existing knowledge. Not only was the formulation of questions in the online exams 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 material. 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.

5. Concluding Remarks

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 time management and therefore provide short study times. Only a small program of optional courses is offered. Although this study structure has some advantages (especially from the organizational point of view), 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 students 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 lecture concept. It is necessary to explain the usage and the inherent benefits of the selectable 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.

A critical reflection shows that the dialogue between learner and teacher, the individual responsibility and an adequate understanding of media literacy within self-organised learn process is very important. The investigation has shown some deficits herein. Reasons for that might be of structural nature:

5.1. Isolated Applications

The introduction of learning concepts which require the students' self-responsibilty cannot lead to a sustained improvement of self-organisation abilities and readiness if they are stand-alone in a study program. These soft-skill training concepts must be implemented in the curriculum from the first semester on. The loss in flexibility concerning the choice of modules and the compact structure of a study program produce a position of defense from the students against the self-responsibility of their academic studies. Many students have a passive position compared with learning contexts: To reach the short term learning goals without to much efforts and in a minimum of time. The consciousness with self-organised learning and the necessary media literacy can be trained by daily use only.

5.2. Digital Naives

The students under investigation were students in media informatics, a study program of computer science and media technology. Interestingly and astonishingly these students have shown some deficits in media literacy. Doebli [2] created the notion of *Digital Naives* from the Digital Natives and tries to describe the fact that young people have not enough criticism against media and tend to a cursorily usage of media. This can be seen in the study group under investigation. It was no problem for them to work with the material on a technical level. But it wasn't recognized that this material offers the possibility for an in-depth learning process. Contrary a kind of self deceit by a wrong usage of the learning material was mentioned by the students themselves in the questionnaire.

5.3. Characteristics

Self-organized learning includes the open exposure to individual deficits in understanding. The learner must have

the courage, to fill his or her gap in knowledge by asking in the live coaching. The traditional classroom lecture has no culture for lot of discussions and many questions from the students. Singular lectures with a different concept cannot lead to a corresponding cultural change. Finally, a self-organised learning can only be seen, if the students have a personal interest in the content of the course. However, this is often negatively associated with being a nerd or geek.

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