

Best Practice: Massive Online Courses at the BTU Cottbus-Senftenberg “ECO-Campus”

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ABSTRACT

The limits of digital teaching in the academic education and training are today in times of MOOCs, not only set to the own university. At the BTU Cottbus-Senftenberg in the project “ECO-Campus” different digitization concepts were developed. The Project is supported by the Federal Ministry for Economic Cooperation and Development (BMZ). The goal of the project is to share university content on sustainability with international partner universities and to establish the subject especially in the curricula of courses which traditionally pay little attention to sustainability concepts. The Eco Campus platform forms the link between the students and these materials. Due to the high number of international students, who use the newly created and customized Moodle instance, there is a high degree of heterogeneity.

At the same time at each partner university lecturers from different disciplines and cultural backgrounds are teaching, so that the materials for the envisaged Flipped Classroom concept must be provided flexibly. The portfolio of digital tools within the learning platform is diverse. The instance includes different scenarios for synchronous and asynchronous communication and collaboration. In addition, various formative and video-based assessments, gamification approaches and various Video formats are used. The methods follow at the macro level (total of all courses) Bruner's approach of the spiral curriculum and in the micro-level (a course) Kolb's experiential learning cycle.

Keywords: Assessments, Training, Distant Learning, Educational technology, Engineering education

1. INTRODUCTION

University teachers complain regularly the lack of knowledge of their students. This is not a new problem. Rather, it points to an ongoing conflict between generations. [1] This conflict is based on the usual methods of knowledge acquisition. For example, teachers and students in the past have rather relied on print media due to the lack of alternatives. The development of digital media, also in higher education is rapid and it will probably be in the future. The current generation of students has therefore innately another media usage and related affinities to developed media than the previous. So the goal of the “ECO-Campus” project is to share digitized university content on sustainability with international partner universities and to establish the subject especially in the curricula of courses which traditionally pay little attention to sustainability concepts.

So in addition to the already existing Moodle learning platform for students at BTU [2] a new Moodle platform was adapted so that the information can be easily exchanged. In this paper we name examples within the platform and describe development potentials.

2. MEDIA USAGE IN GERMANY

The theme group "Innovations in learning and teaching scenarios" has determined from a sample size of 27,000 students at 153 universities the following shares of media use [3]:

- 22% micro-blogging (like Twitter; a still small but steadily growing share)
- 66% forums
- 69% subject-specific databases
- 78% Wikis
- 82% Social Networks
- 92% Digital Presentation Tools (e.g. .: Online PowerPoint presentations)
- 98% Digital texts (almost all students)

About 80% of our students is learning with mobile devices such as tablet or smartphone, this has resulted in a BTU internal survey on the use of E-learning. [4] The desire of students to digital and location independent media is underlined here clearly. In addition to the aforementioned digital media also electronic exercises or assessments with 60% of the usage and videos have been established with a frequency of use of 70% among students. Both are media formats, which are already incorporated within the ECO-Campus platform and are constantly enhanced. The SWR2 knowledge-author Silvia Plahl notes that in both learning scenarios, the way the interactions of learners has grown steadily with the media. [5] As a possible result may be noted that already 33% of the students work with pure interactive tools.

Another result from videos and Assessment is a mixed form of a video-based assessment. The learners are encouraged to participate by themselves by placed in a learning video questions and answering these questions independently. The learner becomes so the active protagonists instead of the receptive participant.

3. VIDEOS AND DEVELOPMENT POTENTIALS

First of all some basic didactic considerations. In the development of instructional videos the maxim: “As short as possible and as long as necessary” applies. This is due to the average attention span of video learners. A possible target for presentation videos represent a maximum of 20 minutes. [6] Now the question is: How we can implement this in the existing or future developed videos? One possibility would be the further subdivision of the videos in subtopics. Furthermore, a navigation can be integrated within the video, so the learner can jump more accurately to his desired contents. (See Fig. 1)

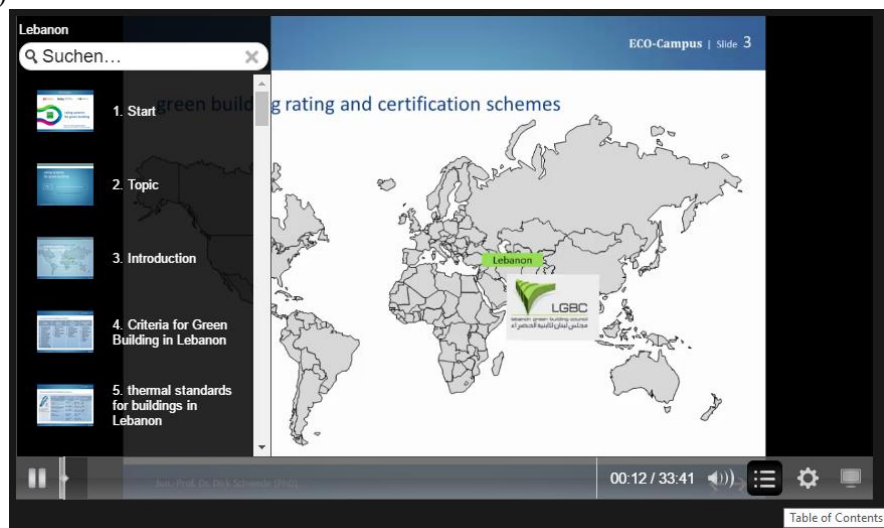


Figure 1 Video with navigation bar

This is especially relevant by an interruption or re-watching of learning videos. Moreover, the videos can be enriched by animations, so the attention can be kept more constant during each slide. Another way to hold the attention and to give the students feedback on the understanding represent videobased assessments.

4. VIDEOBASED ASSESSMENTS

Videobased assessments are normal learning videos, which stop at certain set time stamps and the learner has the possibility for himself to enter answers. There is direct feedback whether the answer is right or wrong. After a certain time or properly enter the video continues automatically. Professor Dongdong Zhang has empirically demonstrated that well-placed interactions for learning outcomes are beneficial. [7] Nevertheless, it is a balancing act. Poorly thought out or misplaced actions can bring no added value for learning outcomes. The learning process can be even hindered by false information. Another problem of learning videos represents linearity. In this case, it is meant that learning videos illustrate generally an issue with examples. Understanding the learner is tested by an interactive quiz at best, and a possible solution presented. Complete software for creating such videos are Camtasia Studio 8 or Capira Socrates.

In addition to integrated assessments, within a video integrated hypertexts are another way to enrich the existing content with interactive content.

5. INTEGRATED HYPERTEXTS

When talking about a hypertext video, is meant that within the videos are links to other pages within the platform or external sites. The internal references can be used for further navigation within the platform. The external however offer themselves to refer to other knowledge databases. Both internal links as well as external have the possibility of changing the address. This must be observed constantly. Intern, this can be as far as possible influenced, so there should be no major changes within the video. When referring to external pages whose address URL changes, the whole videos need to be reworked. The advantages of hyper videos are that they can cause curiosity and motivation as innovative technologies among students. In addition to the substantive discussion of the teaching material, media literacy- particularly in the area visual literacy - is promoted. [8] Hyper videos are particularly suitable for active, constructive learning. Hyper videos are complex media. The working and learning with hyper videos is therefore simply not always and places high demands on the cognitive skills of the user. Here is the special potential, but also potential problems such as a cognitive overload when the receptionists. Compromised may especially result from that losing users in a highly linked environment and already retrieved content may not found again.

6. VIDEO SURROUNDINGS

Professor Rolf Schulmeister set the foundation for developing digital knowledge environments, with its triangle of virtual learning. It consists of cognitive, communication and collaboration. [9] So far, we covered with the persecuted scenarios within the ECO-Campus platform only the points of cognition and communication, with a clear focus is on the construction of knowledge. This represents an imbalance, which can be compensated by different measures. In order to redress this imbalance, the scenarios described below can be used.

7. DISCUSSION BOARD AND VIDEO FEEDBACK

The easiest to be implemented tool is a discussion forum. This is an asynchronous form of communication. A synchronous would e.g. a chat, in which, however, a higher support effort is associated. Forums already exist in the platform, but they were rarely used. This is a common problem. Learners do not associate the different materials with each other when they are visually not linked directly. For this reason Forums (incl. posts) can be listed directly below the video. At the same time a user-centered quality control is enabled, in which the learner can point out errors or outdated content within the forums. To increase collaboration activities further, it is possible to end the training videos with a task, which must be carried out in a forum. For example: "Discuss a topic, which was affected only in the presentation." So the final step of the AIDA (Awareness, Interest, Desire, Action) would be fulfilled.

In addition to video, the self-assessments (knowledge tests) take up a large part of the recent didactic concept of the ECO-Campus platform. This is mostly multiple choice or free-text tasks with a feedback. Often the contents of the tests relate directly to a respective slide of the presentation video.

For this reason it offers to export the dubbed Slides as a separate video and add it alongside the existing short response as feedback. In this way we stimulate the visual and the auditory learners more.

8. EXPERIENCE BASED LEARNING UNITS (EBLU)

Based on Kolb's experiential learning approach [9], we have formed a triad of normal learning video, video-based assessment and adapted formative assessment. In the first video the students gets the theoretical access to a particular topic. Here the concrete experience and observation and reflection takes place. In the video-based assessment the learner is activated and he shall begin to think independently abstract. The adaptive assessment consists of one or more test questions which are generated from a pool of questions randomly. The tests got a detailed feedback function. The final phase may repeated as often as the learner wants. Due to the dynamically generated tasks and feedback the learner can demonstrate and examine how far he has carried out the contents. Here is the phase of the active experimenting. This approach is especially useful in natural and engineering sciences. Here are many, but relatively fixed solutions, but the accuracy of the results can be easily compared. However, there is also potential transfer to the economic science, even medical and legal subjects use nowadays MCQs as audit evidence, in some disciplines. This is more difficult in the human sciences, where a high abstraction potential is required. This E-learning scenario is not only a linear structure. Learners can skip content, but return to the previous again if necessary. Also the entrance in the scenario is also not specified. (See Fig. 2)

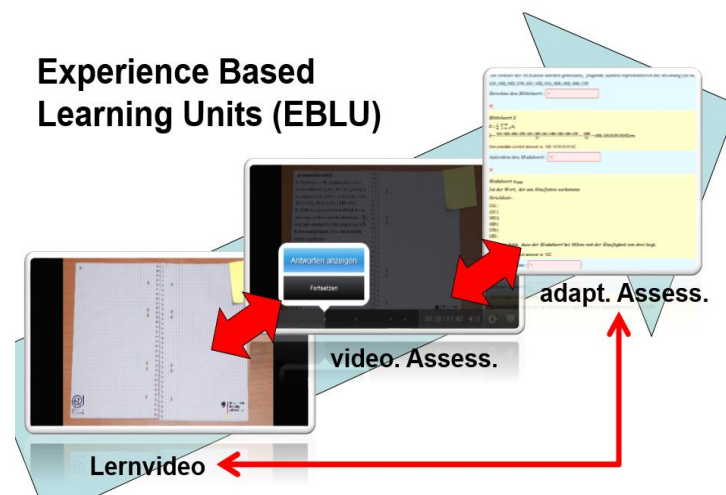


Figure 2 Scheme Experience Based Learning Units

This scenario is quite complex built in practice. The part just described is merely the micro level. Other Experience Based Learning Units are linked together logically within a macro level. Following Bruner [10] spiral curriculum to EBLUs put together so that the result is a structure of knowledge about basic skills to more complex knowledge. However, this represents only one strand.

Furthermore, classroom sessions should still take place (at every university in ECO Campus composite) The Units adapt accordingly so that two spirals with connections (for example, references to lecture or Elearning material), similar to the double-stranded helix of DNA are formed. For this purpose, should further logic connection (e.g.: Direct redirects within our units) be integrated, to create more cross-references to previous- or continuing related topics.

9. FUTURE UNIT DESIGN AND MOTIVATION METHODS

It has been thought about a new course design and introducing feedback scales for students. It is possible to prepare the course content in the form of a lesson with progress bar. Learners so have a better overview of the current status of its processing of a lesson. At the same time as an extrinsic motivation arises in that learners want to accomplish 100% of a lesson when the steps required to be disclosed transparently. This is also an approach of gamification (Learning through play; not to be confused with serious games!) Students can also go to Moodle in theory between the lesson format and traditional course format.

Another interesting approach in the field of gamification would be to give students badges. Here certain actions of the learners are recognized within the learning platform and by performing these learners receive such a badge. The badges are included as a kind of partial performance, behind which certain competences of Learners receiving it should have. This badge, of a learner can also use outside the learning platform Moodle and used in some area as a reference. So another certification system in addition to the certificates is created.

10. RESEARCH APPROACHES

The ECO-Campus platform itself is in practical a research project in which teaching and learning content can be researched. The following hypotheses have been made:

In different countries, there is a different use of digital media. Admittedly, this approach has already been partially researched in adult education and affirmed [11] (it depends strongly on the child's early education from which considered but culturally significant differences having), nevertheless arises why large open online learning platforms utilize similar concepts and materials the question.

The next research question focuses on the collaborations between different nations in the learning platform. The economist Hofstede holds various cultural dimensions between collaborations companies from different countries, which affect the successful completion of this cooperation significantly. Basically, a collaborations is nothing but a cooperation and thus comparable to the collaborative learning. Therefore, can be detected in a first step whether similar effects as occurring from Hofstede also in collaborative learning processes. [11] If this is the case, the criteria of Hofstede can be examined of congruence or new criteria may be added.

As last research point it would be important to examine, how far the translation into the native language influences the learning success. This effect should our assumptions be very positive.

11. ACKNOWLEDGMENT

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