FILMLETS FOR DOING MATHEMATICAL MODELLING IN SECONDARY SCHOOL

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THE IDEA OF MATHEMATICAL FILMLETS

In consequence of the idea of situated-learning and situated-cognition, the Cognition and Technology Group at Vanderbilt (cf. CTGV, 1997) developed the instructional design of the Anchored Instruction that uses the medium of filmlets for learning mathematics (e.g. the adventures of Jasper Woodbury). In their research, Schnotz and Bannert (2003) for example present a model how learning with animations supports learning.

Now due to the concept of mobile learning (cf. Döring & Kleeberg, 2006 and Fischer, Mandl & Todorova, 2009) new possibilities for learning in classrooms, for example by mobile handhelds like the iPod-Touch, are given. However, a huge number of semi-professional videoclips with mathematical contents are available on different internetplatforms like “youtube.com” or “sofatutor.com” to the students. Besides, it is important that filmlets can convey different intentions, Ludwig and Xu (2010) for example use filmlets to present modelling tasks.

RESEARCH OBJECTIVES

Our aim is to find answers to the following research objectives:

1. How can mathematical filmlets support learning with modelling tasks?
2. Can different patterns be identified for learning with mathematical filmlets in the context of modelling by using mobile handhelds?

DESIGN AND CONSTRUCTION OF THE MATHEMATICAL FILMLETS FOR DOING MODELLING

Mathematical filmlets consist of real sequences, animations or a mixture of both. At the current state of development, there is the idea of splitting them into several short clips: the first one presents the task only while the following clips give hints for solving the problem. The student or the small group of students decide on their own wheather they want to see the hints but if they do so the hierarchy must be kept. According to the use of filmlets in foreign languages (cf. Liebelt, 1998), the time period should be limited to approximately five minutes (the sequence of all clips).

For the presentation and adoption of these filmlets two different modes are possible: The first option is that all students use a laptop or a computer; the second alternative is the use of mobile handhelds (e.g. the iPod-Touch). Besides, the students can use

the laptop/computer or the mobile handhelds as a multi-tool which combines different tools like a calculator, spreadsheet or a functionplotter.

PROCEEDING

In order to answer the research questions, the proceedings will go forward as follows: the focus of the field study will most probably be a sample class (grade 9) in either middle-track or high-track school. Furthermore, several students of this class will be picked out for a more detailed analysis (case study). The study will take place in ordinary lessons over a time period of approximately seven weeks. This time is necessary for the students to get familiar with the mobile handhelds (e.g. iPod-Touch). The storyboards, concepts, shooting and production of the filmlets in question (up to 10 different modelling tasks) will be done by our research group.

First experiences with the usage of the iPod-Touch have already been made in grade 10 in the field of graph/curve sketching. As a result of previous observations it is noticeable that students have hardly any difficulties in using the iPod-Touch. Nonetheless, the display of the “mathematical apps” (e.g. functionplotter) which are unfamiliar for most students cause difficulties for them.

PRESENTATION

The content of the poster will be presented in a graphical format. Furthermore, the iPod-Touch given (approximately 12 devices) will demonstrate the scientists how to watch filmlets on them in order to experience the potential of such mobile handhelds.

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