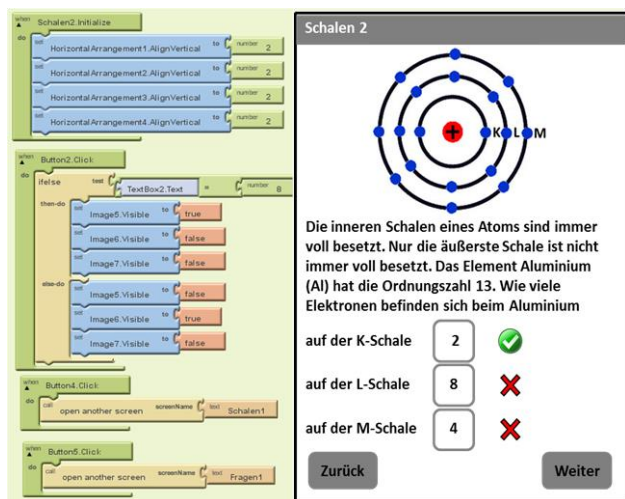


Mobile Learning Scenarios

Developing Learning Programs for Smartphones

OSZ II Barnim, Abteilung Berufliches Gymnasium

Advanced Course on Electrical Engineering



The Oberstufenzentrum II Barnim is a vocational training school where students can get their A-level diploma (qualifying for university admission) after 3 years of secondary school. The project was developed with pupils in 13th grade with a specialised course in electrical engineering. The programming guidelines were implemented using the *MIT App Inventor* by the working group “computer science”.

Description

Learning programmes were developed as smartphone-applications for Android operation software. At first investigations were made about learning programmes in electrical engineering for smartphones and their acceptance and feasibility as well. Finally prototypes were developed taking the study results into account.

Preparation

First of all the term “courseware” was defined within the framework of the project. Thus courseware should support the user to understand and learn about the subject-related context in an interactive way. Core elements in courseware are:

- Knowledge transfer
- Query knowledge and the understanding of subject-related connections
- Test the user’s knowledge

Investigations revealed that there is no courseware on electrical engineering so far. Courseware specified for one subject that can be worked through in 10 to 15 minutes is more likely to be accepted by pupils. Interactivity and animations are enhancing this effect. However courseware can’t substitute real lessons but can support private study during idle times. The *MIT App Inventor* was the easiest tool to implement the courseware and with its help it was possible to develop a courseware focusing on the atom model by Niels Bohr.

Technical and organisational Preconditions

Hardware requirements: PC with internet access

Software needed: Browser (e.g. Chrome), graphic editing software (e.g. PowerPoint)

Organisational Preconditions: A Google-account needs to be created to work with the *MIT App Inventor*.

Technical knowledge required

In order to work with the *MIT App Inventor* pupils should know and be able to apply the following details about data flow control:

- Input/Output
- Conditional directives
- Loops

Step 1 A topic has to be defined that can be finished a specified period of time.

Step 2 Simple courseware is a sequence of different screens in which the following details are implemented:

- Pictures and animations (Image)
- Movies (VideoPlayer)
- Text (Label)
- Input method (Button, CheckBox, ListPicker, TextBox)

At first the different screens have to be developed in content and graphically. The software MS PowerPoint was used during the project to deal with that task. Developing the screens is very good for pupils to fortify their knowledge.

Step 3 Implementation using the *MIT App Inventor* and test

Step 4 Distribution

Opportunities

Developing courseware is a very good possibility to deal with the subject matter.

Because programming is very popular among pupils it is relatively easy to teach basics of data flow control.

Using courseware helps to deepen and train your knowledge.

Challenges

Working with the *MIT App Inventor* is only possible online which causes problems with internet capacity and installed firewalls. If pictures and videos are used copyright regulations have to be considered.