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Final Report, November 30th 2009

Engineer Your Sound! (EYS)
Participatory technology design using the
example of music. Secondary-school
students developing didactical concepts for
interdisciplinary engineering education

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Engineer Your Sound!
Participatory technology design using the example of music

Project description

The daily use of information and communication technology devices leads to the assumption that young women and men seem to be basically interested in these kinds of technologies. Nevertheless only a few of them consider this field in their choice for future occupation. One difficulty in getting young people excited about technological professions lies in the task to encourage users of technologies to participate creatively in the designing process. The project *Engineer Your Sound!* (EYS) answered to this challenge by using music as a participative approach to technology. Music is considered to allow an easy access to technology and to be a rather gender-independent field of interest, thus, especially girls should be addressed. The second objective was the development of didactic concepts enabling young people who have no respective skills to become musically creative.

Course of the project

The project was structured in four stages: In the beginning, twenty young women and eight young men of the 12th grade of the Musikgymnasium Dreihackengasse, a high school with focus on music education in Graz, were introduced to the scope of music-related technologies by visiting the Institute of Electronic Music and Acoustics (IEM) and a workshop including respective inputs. In the second stage, groups were formed in which the students developed and realised their own ideas. In this process they were coached by a female sound engineer graduand of the IEM who supported them in the acquisition of technical competencies. In the third stage, the learning experience of the students was used as input for the development of didactic concepts. The final stage consisted of various presentations of the results at conferences and events. One of these events was organized by the participating students themselves which marked the official end of EYS. When asked about the highlights of the project a young woman stated, "The recording studio was a monster-cool experience." And a male student said, "What I liked about it was that we could produce our own ideas."

The students' projects

At the second stage of the project, five groups of students developed and realized their project ideas under self-defined group names. This part was the core of the participative designing process of EYS. The group "Emotions" wanted to test the influence of music on the mood of scenes in films. The young women filmed three enacted scenes and chose songs which were supposed to either convey melancholic or happy mood. At the sound studio of the Technical University of Graz the students recorded these songs, reworked the recordings on the computer and added them to the short films.

The group "Hintergrund im Vordergrund" ("Background to the Foreground") worked with film- and sound recordings as well. In this project the students wanted to bring a selection of background noises to the foreground. They filmed scenes in public places and reworked the audio track on the computer. They took

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it even further by replacing original noises by related sounds, they found in databases from the Internet. Thus, for example, the use of a pocket lighter sounds like a flame thrower.

The students of the group "Just Danube" developed an air instrument which is based on the technology of a Nintendo® Wii-remote control. The instrument consists of a circuit board on which a field of infrared emitting diodes is arranged and supplied with electricity. Reflecting material attached to the player's fingers sends the emitted infrared rays back to an infrared camera (in this case the Wii-remote) in the middle of the circuit board. These signals are passed on to a computer, where the information is processed. In the program PureData the positions of the reflecting material in front of the camera previously were virtually associated with certain notes. These notes can be programmed with sounds of any instrument – the three young women of this group decided for the sound of a piano.

The group "Soundexperience" wanted to experiment with their own recorded sounds. For the material, the students composed a song and recorded it together with other songs in the sound studio with support of the coach. The recordings were reworked on the computer and remixed with effects.

All these project activities were documented in photographs, videos and interviews taken by the fifth group "Die Spitzel" ("The Spies"). From this material the students produced a documentary to which they also attached a soundtrack.

The didactic concepts
From a collection of different ideas generated in a workshop in the second semester the students chose two central themes and again worked on them in groups. In a few steps the groups reflected on their experience and thus firmed up the concept ideas. Both concepts share the principles of recording and reworking audio(-visual) impressions.

One team focused on the topic "Was die Straßen uns erzählen..." ("Stories told by the streets...") which proposes to send students into the streets with recording devices (mobile phone, MP3-Player, digital camera, voice recorder etc.) in order to record music of various street artists. This activity and the recordings could be further processed in different subjects, e.g. into a documentary film or a new piece of music.

The project group "Natur- und Alltagsgeräusche" ("Sounds from the environment and everyday life") worked on the idea to have students record various environmental sounds and noises from every day life and thus create a sound collection. These sounds could be used for example to produce a rhythmic piece of music or the sound track of animated cartoons.

Websites:
http://www.ifz.tugraz.at/eys
http://eys.twoday.net/

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