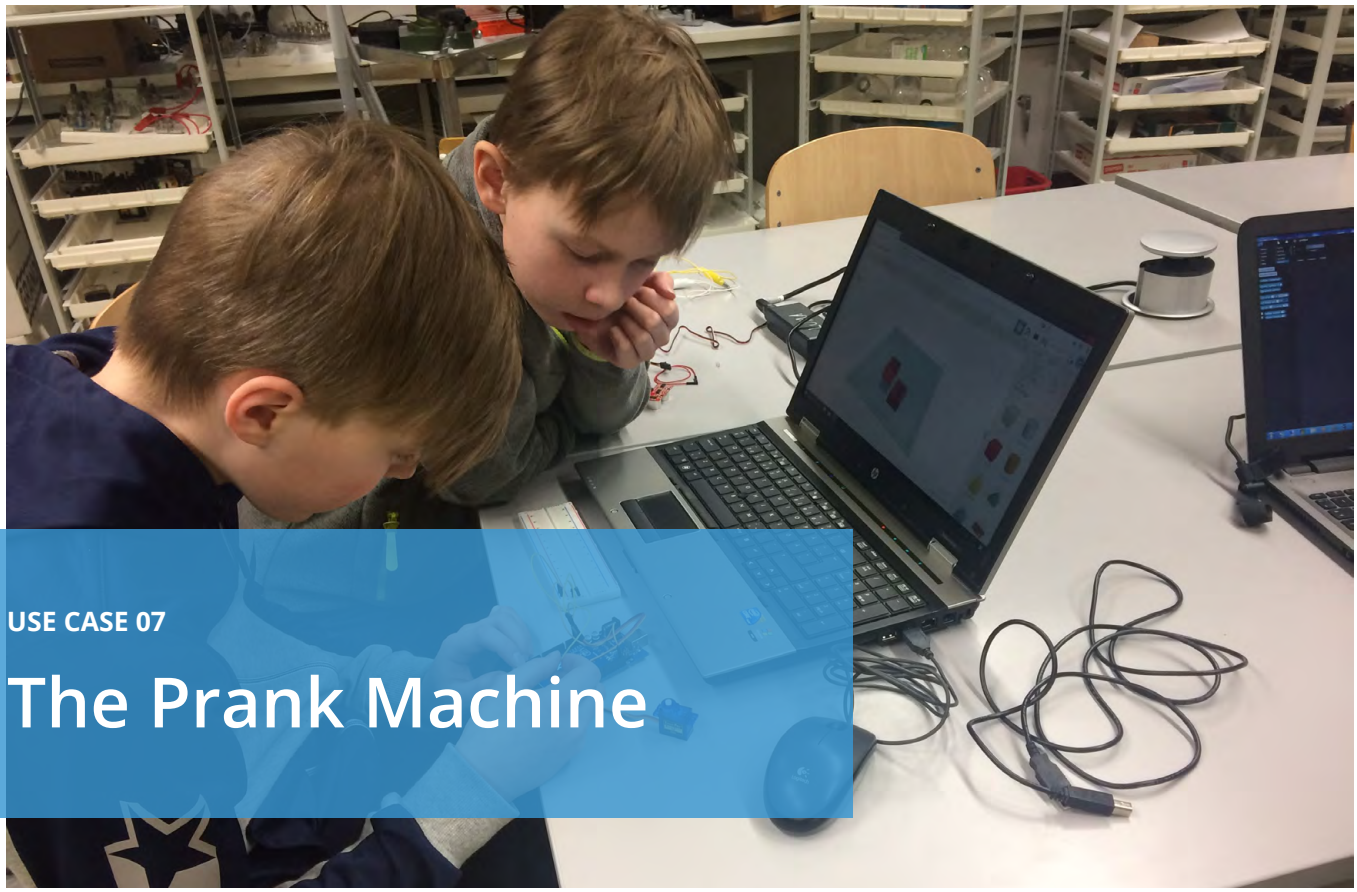

USE CASE 07

The Prank Machine

Age & Level

Elias, Finland
Student
14 years old

Elias is a 14-year-old student in Helsinki. He has a hard time concentrating in the classroom, and has started to skip some classes to hang out with friends around town. His main hobby is playing online video games with his friends. Since he has a lot of experience that he is also good at sharing, he is the leader of two MMORPG guilds. He has his own game oriented YouTube channel, and has gained around 200 followers since he started a year ago.

Primary Actor and Main Goal

His technology teacher has started to introduce the class to Arduino. To her surprise, Elias who has stopped attending her Physics class, is excelling at Arduino and electronics. Although he is dyslexic, he seems to have little trouble programming in the Arduino IDE.

Topic and Content

As Elias's teacher had the students create their own technology projects, she noticed Elias' ideas were standing out, but seemed very complex to carry out. She still wanted to find a way to support his enthusiasm. Since he learned so fast, she made him and another one of his classmates, mentors for the other students.

Description of Environment and Possible Pre-conditions

The teacher plans it so that her students can come up with concepts 6 months before the deadline in December. Although she does have a small lab with basic electronics components that she started to build up two years ago, she knows final projects often meant materials had to be ordered. Since some components had to be ordered from China, sometimes with weeks of shipping time, she made sure to collect material lists as early as possible.

This year, as she had started to collaborate with the woodwork teacher, she had a bigger budget for materials, and planned on buying some soldering irons, wire strippers, as well as a laser cutter. After some lessons learned from the previous year, they had decided to collaborate later in the project, to make sure everything got finished in time for Christmas.

Preparatory Work

The teacher asks the students to prepare a sort of 'concept' that outlines the idea behind, the usage, the materials and skills as well as knowledge they will need. As Elias is planned to help out with a range of his classmates projects, he also agrees to simplify his own idea.

While other classmates are planning to create functional projects, Elias wants to create something fun. His teacher had something different in mind, but decides to avoid discouraging Elias, now that he is finally enthusiastic about a school topic. Elias wants to create a prank machine, so that he can film his prank victims for his Youtube channel.

His teacher helps him discard offensive pranks as well as pranks that are too technically complex for the time at hand. In the end, the idea is to create a machine that senses when someone comes close to the school Christmas tree, and that triggers the song 'Last Christmas' at the same time as the Christmas lights start to animate in disco-like patterns.

Description of Activity

As students are doing research on components needed, some have to change their concepts based on technical limitations and material cost. One project planning to use five servo motors and three ultrasonic sensors is completely discarded. Although it is expensive, Elias wants to order an mp3 shield for his project. His teacher knows that the best way to easily control several LED lamps is through using an addressable LED strip, so she helps him order addressable LED christmas lights.

As the ordered materials arrive, the students prototype and test them to learn more about the components they are planning to use. Elias is quite disappointed as he notices the mp3 shield uses so many pins on his Arduino board that he can't fit the other components and functions he wants in his project. He decides to use two Arduino boards, and brings the one he has personally brought to school.

Starting out, he tries out the mp3 shield with a special code library he has found online. Once he gets it working, since he found there to be few pins and power left for the sensor he had planned, he decides he will craft his own push button to trigger the song. The teacher helps him find tutorials online, and makes sure the textile teacher can allocate some time to help out ordering materials and sewing the button. Elias then finds resources online for how to connect and control the addressable LEDs he has ordered. He uses a PIR sensor to trigger a light animation when someone was close to the Christmas tree. The e-textile push button is made to be a carpet in front of the christmas tree.

Other Stakeholders and their Possible Interests

As Christmas break is approaching, Elias has his Christmas prank installed in the school's main hall. One day he decides to film the reactions, and edits a compilation of the best reactions. With the consent of the ones depicted, Elias then shares the compilation on his Youtube channel. It is spread locally in the school, giving him more followers, and it is suddenly shared on a famous blog authored by a "Maker".

Success and Condition

After some time, Elias starts to explore a new identity as a Maker. He contacts the blogger, and continues to expand his network as well as work on more advanced projects.

Failure and Conditions

It is being challenging for the teacher to evaluate the student projects according to the learning goals. Since the student projects are not framed by neither theme/topic nor technical solution, the variation of outcomes might make them challenging to realize and evaluate.

Variations

The brief given was kept open, but could have been tied to specific technical solutions or related to certain theoretical topics.