USE CASE 06

Greenhouse

Primary Actor and Main Goal

At school she has been introduced to programming and basic electronics, but since she didn't understand it instantly it affected her self-confidence. Jenna, having a perception of herself as a fast learner, is starting to think this is not her subject. She has also noticed that some commonly low performing students in her class seems to excel at these subjects. She wants to prove herself, but at the same time relate it to her interests to make it more motivating and meaningful for her.

Age & Level

Jenna, Finland
Student
13 years old

Jenna is a 13-year-old student in Helsinki. She cares deeply about the environment, and loves to take care of plants and animals. Her favourite school subjects are all related to natural sciences, and she is an independent learner who reads a lot about things she finds interesting in her spare time.

Topic and Content

Jenna's teachers, one technology teacher and one math teacher, want the students to work more cross curricular. This is the first year that they try to involve electronics and programming in their work together, and none of them have much experience.

Description of Environment and Possible Pre-conditions

The students are asked to work in pairs to realize their projects. Jenna wants to work with her best friend, Aina. They share similar interests, and as they have been introduced to Arduino and programming, they have also asked their parents to buy electronics to that they can learn at their own pace at home. Soon, Jenna and Aina agree that they want to build an automated greenhouse.

Preparatory Work

The teachers are not sure how to help them, they have only bought some kits with components and are not sure their idea can be realized. Most students have much simpler ideas, that the teachers can help to realize. Aina's father, who works in IT, knows about Arduino and Raspberry Pi, so he decides to help the girls order the material needed. He is later contacted by the teachers, so that he can share his knowledge on where to find components and educational resources with them.

Description of Activity

Once the material has arrived, Jenna and Aina have a systematic approach towards testing them and putting everything together. As per Aina's father's advice, they split their problem into small parts, and test the solutions separately. Since they are both independent learners, they can find most information needed to build and code the core parts of their project by themselves. They test the light sensor first, to learn what values they receive in different light conditions. They then try the temperature sensor, and explore different way to build your own humidity sensor. Aina's father helps them to filter the captured data to make the values more stable.

Other Stakeholders and their Possible Interests

After spending some time realizing their spare time project, they decide to bring it to school to show it to their teachers. The teachers are impressed, and have Aina and Jenna present their project to the class. They also try to understand what resources and knowledge will be needed for themselves to support similar student projects to be created in school.

Success and Condition

The teachers learn that Aina and Jenna were able to build a more complex project not only because they had Aina's father as a support, but because they came into the project with no idea of how feasible it was. They were also able to realize the project independently as they did it at their own pace, driven by their own motivation and interest in the final result, and since they were both independent learners. In the end, Jenna and Aina had as much electronics knowledge and skills as the high performing students in the same subject.

Failure and Conditions

Without Aina's father helping out, the girls would not have had the support needed to finalize their project. The challenge for the school would be to make this visible, and provide the appropriate support. Jenna and Aina would perhaps not have had the opportunity to understand that they were as able as their other classmates in regards to hands-on technology. The eCraft2Learn systems ability to put the learners in direct contact with experts would make this scenario possible for more students.