Exploring children's transformative technology designs

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Abstract

This short paper presents design exemplars created by children that aim at better than "good" and transformative technologies against bullying at schools. In particular, we discuss the designs created by a group of sixth graders (12-13 old), focusing on the low fidelity prototypes and technology descriptions. We also examine the values children identified as driving their designs. While many designs emphasized individual and relational empowerment, also collective empowerment can be seen. In the ideas pictured values such as justice, protection, entertainment, and bringing about punishments, or scaring those that bully others. On the other hand, some ideas picture values such as bringing the community together, building friendships, as well as collective problem solving, and empathy for others, even those who bully others.

Keywords

empowerment, values, children, bullying, critical design, child-computer interaction

1. Introduction

Inspired by the call for the CHI community to consider how technology for children can be better than 'good' and transformative, we have explored and identified a set of designs exemplars created by children that can be considered transformative. We approach transformative technologies and designs in line with Kajamaa and Kumpulainen [8], as something that breaks away or transforms the given, taken for granted, for the purpose of serving personal or collective goals. We are particularly focusing on collective goals around empowerment of children and tackling oppression, focusing not only on individuals but on collectives (see e.g., [3,6]). We acknowledge that Child Computer Interaction (CCI) research community has invited children to design technologies that serve children's development and well-being in many different ways; their social interaction and connectedness, their learning, their expression, their play, and their personal growth [10]. We also acknowledge there is an evident interest in the CCI community to design for empowerment and emancipation of children as well as to tackle marginalization, oppression, exclusion and domination in the lives of children – as individuals and as collectives [5]. All this can be considered as design that aims at better than 'good' and at transformative technologies for children. However, we are lacking in design exemplars created by children with such design goals.

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2. The Make-A-Difference project

We examined designs created by children in the four year Make-A-Difference research project [7] that aimed at tackling bullying at school, and particularly scrutinized in which ways the designs created by children can be considered at aiming at more than 'good' and be 'transformative'.

During the project, we worked with several schools and classes of children in Oulu area in Finland. The participating children engaged in a design process involving sensitizing with the topic, ideation, design, prototyping, mobilizing the stakeholders, evaluation and reflection, see Figure 1. In the project, we invited children to collectively scrutinize the problematic current, to dream about a better future and to take action towards that.

For the purposes of this paper, we discuss designs created by a group of sixth graders (n=22, 12-13 old). We particularly focus on the outcomes of the prototyping phase (phase 5 in figure 1), while we also examine the values children identified as driving their designs during the critical analysis phase (Phase 4 in figure 1).

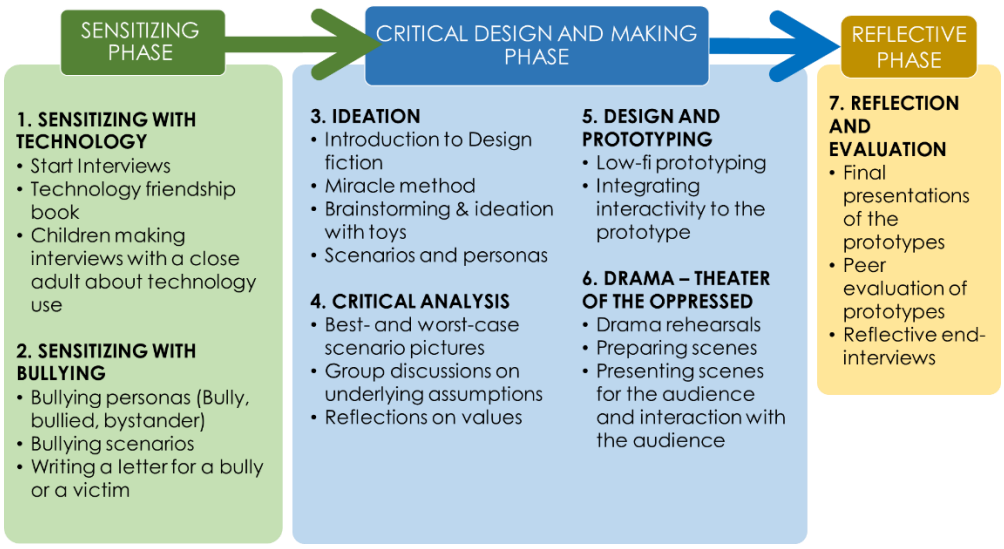

Figure 1: Design process used in the Make-A-Difference project.

3. Transformative design exemplars from children

Next, we describe the designs created by the children.

Electric Shock Robot detects bullying. It uses a teleport to transport from one place to another and punishes the bully with electric shock. It films all the bullying situations and prevents unfair punishments.

Size-changing anti-bullying police car can be called with an app. The bully can be brought into the car and the car itself comforts the victims. The app includes car location information.

Invisible pig-shaped comforting music robot recognizes bullies and sad people near it with its antennas. The robot plays music which comforts and stops the bullied from

hearing the mean things bullies say.

Robot team consists of four robots (monkey, crocodile, dog, and Santa). They can be called when bullying occurs. The robot team talks with the bully and punishes the bully. The punishment is e.g. cleaning the school. The team also rewards bullies when they stop bullying.

Empathy stamp robot is a combination of a hippo and a turtle. It stamps a heart on everyone who enters the school. It encourages bystanders to step in when someone is being bullied. The stamp deletes all negative thoughts and creates a happy environment, so that no bullying occurs at school.

During the project, the children created low-fi prototypes of their technologies using e.g. stuffed toys, crafting materials, and simple electronics. Their prototypes can be seen in Figure 2 below.

Figure 2: Children's anti-bullying technology prototypes.

4. Values driving the children's designs

We also engaged with the children in the analysis of values driving their designs. We found groups who quite heavily focused on the empowerment of individuals, in relation to bullies but also in relation to "stupid" teachers (Their designs thus featuring Individual [4,9] and relational [1,2] empowerment).

Justice emerged as one of the driving values of the children's designs, for example as the reason for recording any bullying incidents: *"Well, at least they that describes the situation. That it could... Then there's evidence that this person is bullying another", "Well, because, if there are some stupid teachers who don't believe the person being bullied", "Well, that the bullying would stop." [researcher asks: Why is it important?] "I Don't know…" [researcher asks: Is that just fair?] "Yes."*

Another driving value was the **protection of those in threat of bullying**, through an easy interface and early detection: *"I guess it's just that it's able to intervene really easily and it's easy to call", "To get it there in time, so that nothing more serious happens". "It makes me feel so nice and safe."*.

As well as **entertaining the person being bullied**: *"That there could be someone in that app that, if the other person is feeling bad and is crying and being bullied, they can press a button in that app and then the app makes some funny noises or even makes a video that is funny, you don't... You feel a little better and then the robot team comes."*

Scaring or punishing the bullies also emerged as a value in the prototypes, for example through designs that look scary, or express authority: *"Because it's kind of like a combination of a police car and a dragon", "It may scare the bullies a little, but at the same time it amuses those who are bullied.", "That they realize to stop it, and then those cops will be*

able to just take them there in the car for an interview."

Some groups concentrated more on the school community (Their ideas thus including collective empowerment [4,9]). Here, a driving value was creation of a positive atmosphere in the community e.g. through different common **activities that bring the community together and build friendships:**

"I guess you can't fit a lot of people inside [the police car] and there's room for a movie theater or a disco or something like that.", "[At the party] you can create that positive atmosphere.", " They feel good, and then everyone would have fun." "Yes [it is important to have fun], and to have someone to be with".

The children also acknowledged, that to making the whole community feel better, they need to **empathize with everyone, including the bully**: *"Well because, they need like… People need to feel good... Haha. [with the stamp] you feel good". "When you feel good, you don't think of sad things. […] If they go to school feeling sad or stuff, and get the stamp, they don't feel sad anymore", "Everyone will feel better if they don't bully."*

5. Discussion and conclusions

In the Make-A-Difference project, we aimed to enable children to collectively shape and drive technology design and development and to examine, tackle, and reflect on the problem of bullying. Working in groups, children envisioned and created low-fi prototypes to mediate and address bullying at schools.

Many technology prototypes created by the children focused on the empowerment of individuals, in relation to bullies but also in relation to for example teachers, that they thought might not believe those reporting bullying incidents anyway. In their ideas pictured values such as justice, protection, and entertainment – But also bringing about punishments, or scaring those that bully others.

On the other hand, some prototypes focused on the idea of collective empowerment instead of individuals – Their aim is to bring about a positive atmosphere for all pupils. In these ideas picture values such as bringing the community together in common activities, building friendships, as well as collective problem solving, and empathy for others, even those who bully others.

While we do not believe that the outcomes of the design process should be taken at face value, they reveal significant issues of the problem of bullying and the solving of it. While the creative freedom of children may lead to provocative results from adults' point of view, their suggestions reflect the intensity and emergency of the need for an intervention. We certainly see the ideas produced by the child groups as transformative – They encourage compassion towards others, including those bullied, but also the bullies. They promote inclusive behaviors in their school community, and aim at improving the overall happiness of all pupils. The pupils' design and values embedded in those designs reveal an intrinsic motivation and hope to make the world a better place, to make a difference.

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