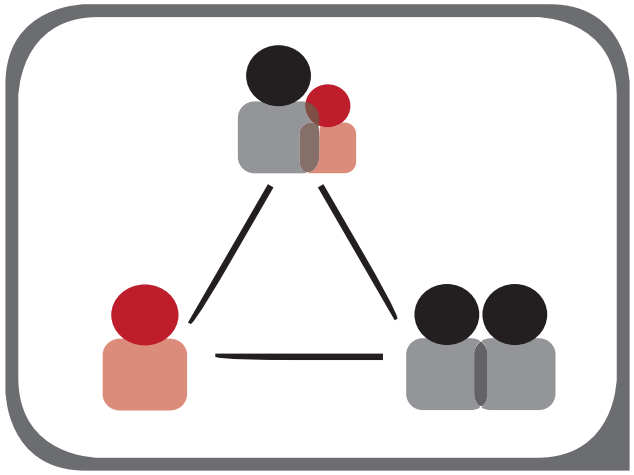

B.O.B

Students:
Desie van den Belt 0847388
Donovan Lewis 0811658
Job van Gennip 0875923

Coach:
Saskia Bakker

Date:
June 12, 2014

Table of Context

Introduction

Tools for teaching

This project is about making new tools for teachers. In the everyday world there is an increasing amount of technology present. What we see is that schools are staying behind at the technology development. The only big change, in the way schools educate the children, is the presence and usage of smart boards in class. Still there is a teacher in front of the class, but the question is; is this the best and efficient way to teach children something? Maybe children would benefit more from having the teacher stand in the middle of the class and have the children sit around them.
The teachers have also a lot of workload, this was the main goal of the project, to reduce the workload of the teachers. Despite that the project was intended to reduce the workload of the teacher, we also gave another meaning to this project. We were looking at how to improve the educational system for the children. What is in the best interest of the children, we feel that the system is there for the children, the next generation. We were searching for something that could help the children learn better, or to understand the world around them better.

Approach

We used different brainstorm techniques and ideation tools to generate some first ideas. Doing user-tests and having a Quick and dirty prototyping session are two examples of different techniques we used to get a better understanding of our user and to get some first ideas. Since these were so important for shaping our product to what it is today we will elaborate later on them. First we are going to tell in a short description what steps we have been through.

The steps we went through were:
- Research
- Pressure cooker
- Observation (User test)
- Quick- and Dirty Prototyping
- User test
- Business canvas model
- User test

At the beginning of the project we started immediately with the pressure cooker. When the pressure cooker was going, we did some research on the project that we had. Furthermore, we did research on what kind of educations where out there. We have looked at “passend onderwijs” [6] and to the country with the best educational system Finland [7].
The pressure cooker was meant as an warming-up to the design process, but also to the project [Image 1].

Secondly, we then went to a school to observe how the situation in a class is. We went to the primary school Reigerlaan, in Eindhoven. We have look at children from the age of six till seven.
After this observation we had a workshop from Saskia Bakker and Katrien Ploegmakers. This workshop was a new way of idea generating. This was the Quick and Dirty prototyping workshop [Image 2].

After the workshop we had a new idea and we wanted to look at what people would think about it and if our idea was in a good direction. That is why we did a usertest, the usertest was with students of the TUe.

Furthermore, after the user test we wanted to have a clear view on the business aspect of our concept. Who is going to pay what? We are working with schools and we realize that they have a limited amount of money to spend on each child. At last, we did an final user test. Because of this usertest we made some drastic changes and came to our final concept.

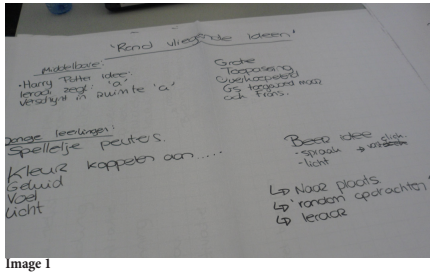

Image 1


Image 2

Prototypes and Process

The prototypes are the best way to look at the progress of our project. By building prototypes you can experience your idea or thoughts in real life before deciding what to do next. Prototyping is a crucial activity in the design process, because you gain many insights by actually trying things out. Trying out different forms, shapes, weights and materials helps you to decide which way to go. We made four prototypes before we got to our final prototype. We worked in an iterative work style, where we reflect (sometimes with our coach) on each prototype to determine the best next step.
At the end we got to our final concept, that concept is what we presented at the Final Demo Day [Image 3]. How we are going to explain our process is by going in a chronical order through our process. We tell what happend at what stage of the process. So there would be a clear overview of our project.

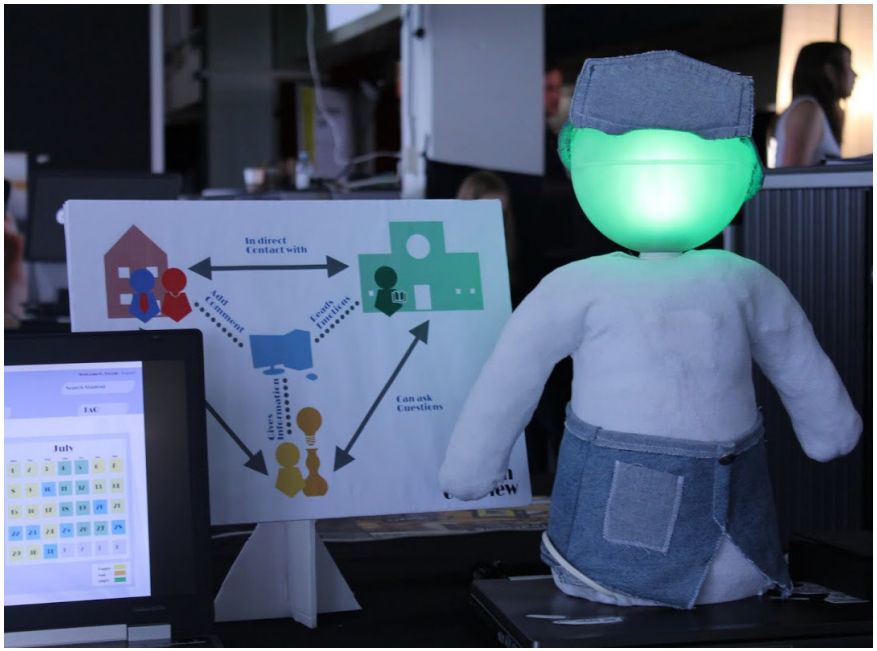

Image 3

Research and Pressure cooker

Research

Research is an important part of a project. You can't ever make a thoughtful decisions and/or concept without proper researching. What is already out there? What are they working on? What does other countries do? What do people think of this topic? These are some question which easily can be answered with doing research.

The question, we tried to answer were:
How does the current educational system in the netherlands work on the elementary school?
What is "passend onderwijs" and how does this change our current understanding of the educational system ?
What makes the Finland's education system the best in the world.

We already understand how the educational system worked, because we once also were children who were part of this system. The research which we did was more to get an confirmation of that we understand this. There was some new insights in all the different school models that are available today, but we found nothing special in particular which changed our concepts drastically.

The "passend onderwijs" concept of the government of the netherlands was something we were not familiar with. Passend onderwijs is a concept that children which need special care/attention, because they have an handicap for example will in the future be placed in normal classes. They do this to save money. This results in that some children get more attention than others. Even when the other children actually also need this attention. This influenced our thinking a lot. We decided that we wanted to create a tool which helps the teacher to give possibility to more equally "distribute" attention among the children.

Doing research to the Finland's education system lead to the believe that we need to increase the respect to the teacher. Because a teacher in Finland is seen as equally important as a surgeon, teacher have a lot more respect. Somehow this level of respects helps to inspire children to develop themselves. Although, teachers in Finland have a far more difficult program to become a certified teacher. This also affects the quality of the lessons. This research set us thinking. How could our product/service, create such a level of respect so children would get inspired to work hard for good results.

Pressure Cooker

As a warming-up to the design process we did a pressure cooker. The goal of a pressure cooker is when you run through the whole design process in one week to fresh up your understanding of the design process. Besides that, we also believe that a pressure cooker is there to getting to know your team you are working with and to get rid of those easy to think of concepts.

The first thing we actually started with, before starting on the pressure cooker, was talking with each other about what we want to achieve during this project and what our strengths and weaknesses are. We later-on divided task among each other as best to fulfill each wishes.

When doing the pressure cooker, everybody was familiar with the design process. So it was a good repetition before we started for "real".

This technique began to flourish when we were brainstorming. Many of the ideas which first seem to be very original or interesting were actually after some thinking not that interesting. This often is caused by the excitement which influence your ability to critically discuss the concepts form a not subjectively point of view. This helps us to come up with original ideas, which will also be interesting after a long time.

Prototype 1

The concept

Our first prototype was Mr. Token. The idea behind Mr. Token was that children could let their teacher know what they thought about the subject with a small gesture. The children could choose between 3 buttons, one for when it was too hard, one for when they had a question and one for when it was too easy. We incorporated these three buttons in a pen. The teacher then could see on a tablet what the children thought about the subject and if they needed extra help or extra challenges.

How did we get to this?

We got to this idea after a lot of brainstorming in the first week [Image 4]. We just named a few ideas that came to mind. One of them was a token, that children check into a certain topic like grammar or math. We changed this idea more to the pen idea, because the children at the age of 7-8 need to be at their desk. We wanted to be anonymous and that children could let their teacher know what they find hard or easy. Instead of a teacher only grading their tests.

Why did we make certain decisions?

There were two major decisions that shaped the project, the shape and the buttons functions [Image 5]. For the shape we chose for a pen. We did this so the children wouldn't get yet another object and therefore minimize children playing with the device. Because it is a small object the children can press a button without everyone seeing this. This was important for us because we didn't want the children to get ashamed when pressing the button. For the buttons we chose to keep it simple. We didn't want too many buttons but we did want to have enough functionality. That is why we went for these 3 buttons.

Feedback

One of the most important parts of feedback we got was that the children really needed a reason to press one of the buttons. We had to give them feedback when they acted. We also got feedback from children. They told us that they didn't understand what button they had to press.

What is the next step?

We really believed in this concept. We believed in this concept, because everyone was positive about our project and we managed to come up with a concept which doesn't add another item to the classroom. This was also one of our goals we set at the beginning of the project. Although, there was some criticism that our project was just a "camouflaged" clicker, but then for children. This was also one of the main reasons we decided to brainstorm some more to see if we could come up with other ideas which are maybe more interesting. Our coach also said the same, that it is important to look for other opportunities which are more interesting. We decided that we will try to do this by attending to the workshop Quick and dirty prototyping where we will brainstorm on a different way than we first did.

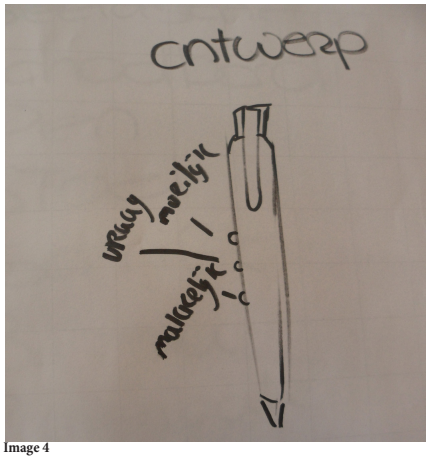

Image 4


Image 5

Observation and Quick- and Dirty Prototyping

Observation (user test one)

We did three user tests at different stages of our project. The first user test was more of an observation. We visited the third grade of the Reigerlaan primary school in Eindhoven. We chose children around the age of seven (third grade) as our target group, because that is the age children start to develop their emotions and start learning. From that moment on there is something from them expected, they need to sit in chairs behind desks [Image 6]. Furthermore, they have to learn to read, do math and even write. This is a lot of pressure on a child that is just coming from two classes where there was only playtime. During this observation we found some interesting things. We found that children had trouble sitting down in their chairs, this due to the fact that a year ago they could sit wherever they wanted. There were some rules, but not as much as in the third grade. Another improvement point was the toilets, they were not hygienic, even the teachers asked us to do something about that.
Furthermore, there was also a problem with preservation of the documents. They have a lot of folders and files they need to save.Our observations was that there was an opportunity to make this much more efficient. We also had a look in there software system, they said to us that they did not understand how it worked. It had changed during the summer and they had to adjust to this. They found that all the buttons and options they had to use where confusing.
At last they said to use that they were quite curious to know how the home situation of children is. They said that this influenced the child's way of communicating in school. We used this feedback as foundation for our concept, because our users (teachers) showed us that they have specific needs and wishes.

Quick - and dirty prototyping

Quick and dirty prototyping was a workshop for students set up by Saskia Bakker and Katrien Ploegmakers. The goal of this workshop was to teach us how to make quick mockups to find out what shapes weight and sizes fitted best to your product [Image 7]. We also set as a challenge to come up with new ideas. During this workshop we came up with a number of new ideas. This is also where the first iteration of B.O.B. appeared. This workshop helped us to come to different concepts on a rather creative way. Also it was a way for us to get out of the first prototype idea, we were clamping on to that idea. This workshop was an ideal way for us to explore more concepts and to have more iterations to the concept we already had. This totally different way of working therefore led to totally different concepts than our original concepts. The ideas that came out of this process where that the teacher should have something they can always carry around, it should be light weighted and have some clear graphics. Also the concept we went further with, was B.O.B. At that time it was more a superhero with multiple options. We still took our first concept, with the token into the iterations. B.O.B consisted of the functions easy, hard, question. Furthermore, because we drew a face on B.O.B we came up with the idea to also have emotions of the child play a role in our idea.

Image 6

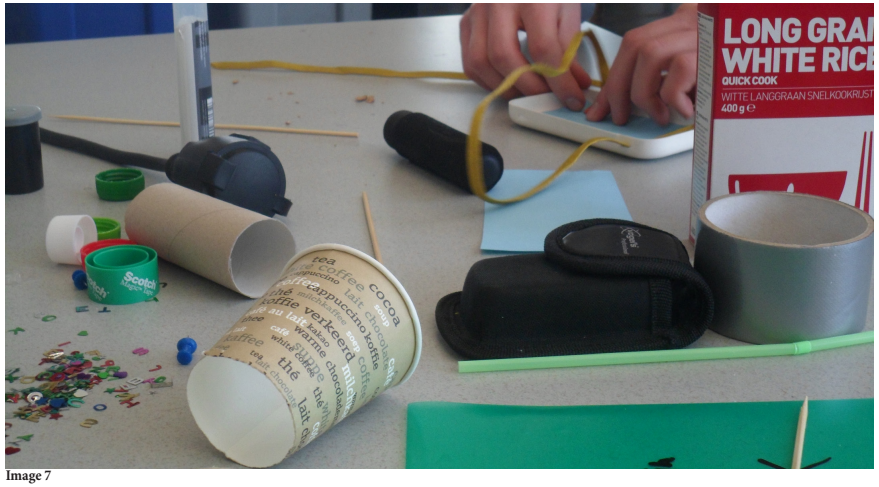

Image 7

Prototype 2

The concept

The second concept that we made was developed during the workshop Quick and Dirty prototyping. [Image 8] [Image 10] The product was called B.O.B. a.k.a. Basischool Onderwijs Buddy. B.O.B. is a doll where a block of foam (the head) had the functions the pen had earlier. We also added a function so a child could also indicate their emotions by turning the block so that you would see a smiley face or a sad face. While the pupils are at school the functionalities changed to easy and hard. These functions where linked with a green and a red panel.

How did we get to this?

We went to a school to observe our target group which are pupils around the age of 7 years. We found some interesting things to work with. In addition a teacher came to us with the remark that she would like to have more insides at the home situation of the children. There already exist such a concept, where a teacher pays a visit to the home of a child when they are 4 years old and want to register at the specific school which we visited . They write a report about this visit which will never be updated again. This is where we saw an opportunity which requires more investigation. This could be done more often better and more extensive.

Why did we make certain decisions?

We chose the concept of B.O.B. because we think that this is a more interesting concept than our first concept which involves the pen [Image 9]. We wanted to create something which is actually new. Mr. Token (our first concept) already exist in a slightly similar way, namly the clicker. Also we wanted to explore a rather unusual side of education, namely the impact of emotional well being on school results.

Feedback

We showed our second prototype to people that were in the workshop Quick and Dirty prototyping. The feedback that we got from them, was that the part of children indicating their emotions was a nice and relevant topic. But only happy and sad were not enough emotions, because a child experiences a lot of emotions and to bring that down to only two is not representative to the actual feelings of the child. Also the idea of children carrying a block around to everywhere they go was seen as maybe a little bit much to ask from a child.

What is the next step?

We wanted to create a sturdier prototype so that we could do a user test without the children worrying about being careful with the prototype. Experimenting with size and weight of the prototype was also something we thought may be a step in the right direction. We also would like to do a user test to test the way children and teachers will interact with our concept.

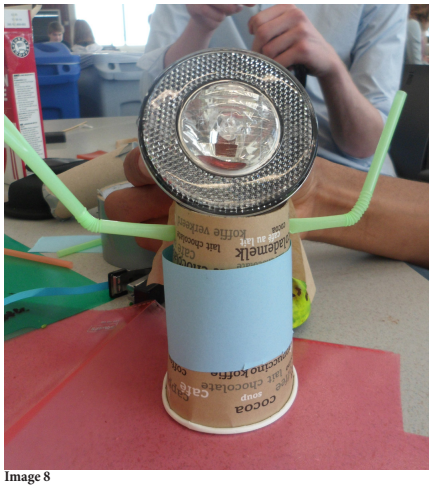

Image 8

Image 9

Image 10

User test

User test two

This user test was important, because it was important to know the mapping (which interaction will be translated to which emotion) [Image 11]. We hoped for people to show how to would express their emotion on a physical object. We needed to know how people express their emotions in a physical way. We needed the users to feel free that is why we chose to show them everything using a powerpoint and gave them a very abstract shape.

We saw some clear patterns emerge when doing this user test.
- Happy people mostly seem to hug the object.
- Sad people mostly try to find comfort at the object.
- People don't have a general thing when being jeal ous.
- When people regret something they bury their face in it.

When proud they mostly lift the object.
Angry people's movements are much faster.
These insights can be used when we are going to shape our product. We need an object that makes sure these patterns won't be broken. Also for choosing a material these new found insisghts will come in nice, because we clearly need to use a soft material for the product in order to make sure children won't hurt themselves during the interaction.

Image 11

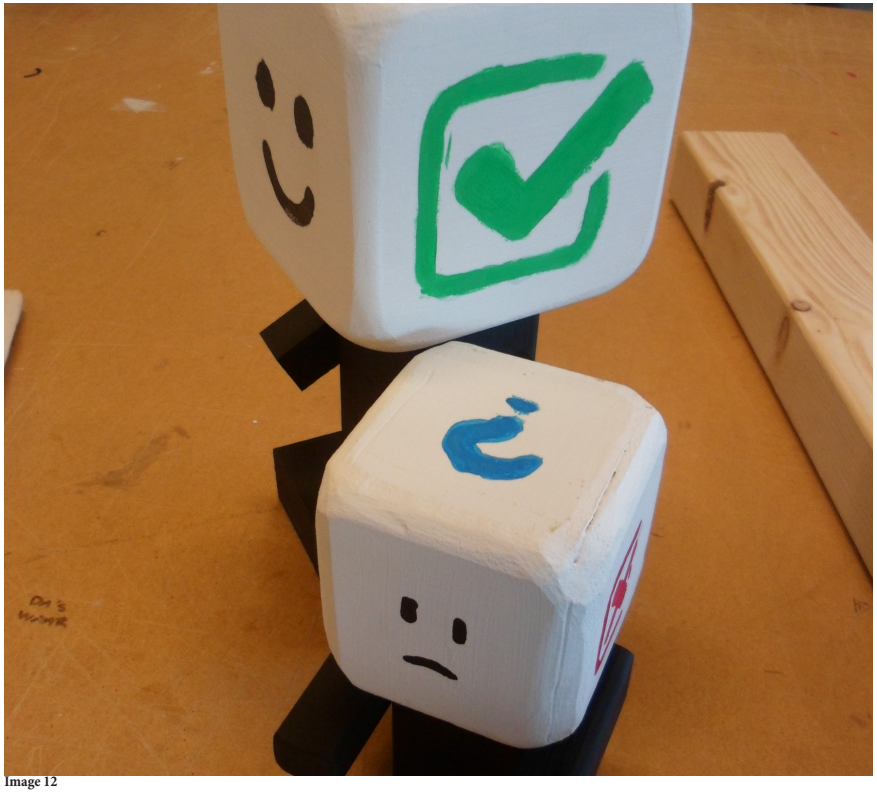

Image 12

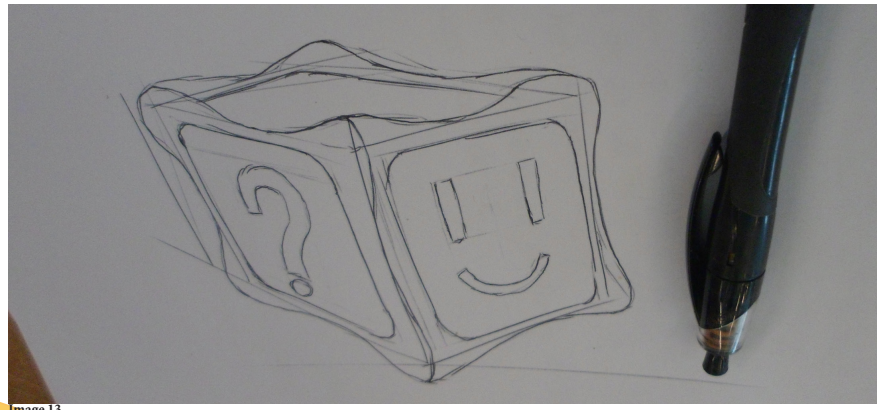

Image 13

Prototype 3

The concept
This concept is more or less the same as prototype 2. The head of a doll is a block, you can turn the head block. The options in this concept for the children are happy, sad, hard, easy and question [Image 12]. You leave the body of the doll at home, this body is also the charger of the head. The children can take the head with them for instance to school. At school they can use the functions hard, easy and question. When children finished an exercise they can say what they thought about the difficulty level, the teacher then can see their rankings on a device (ipad/laptop). We thought of a device which is easy to carry around in the classroom, so the teach won't need to go to his/her desk to look for information. The teacher can see an overview of these rankings. When they do not understand a certain subject the teacher can help them individually. When a teacher sees that a big part of the class has trouble with a certain subject, the teacher can put them together and give the group separate attention.

After a school day the block goes with the children back home. Where they can use the happy and sad options. If there is something wrong in the home situation the teacher will be able to spot this with the happy/sad rankings.

How did we get to this?
Prototype 3 is the prototype that we got after we improved and thought more about the ideas we got at the workshop quick and dirty prototyping. This prototype was meant to be a stronger version of a product we made during this workshop so children would not break it [Image 13]. We wanted to try out what it would look like and how it would feel. We also wanted the symbols to be clearer and to try all these things out. We could not get a usertest, with the school we already been to the first observation.

Why did we make certain decisions?
We wanted to have a stronger prototype one we could bring to user tests. We first made a head that we thought would be big enough to let children use it when they needed it and not use it to play with, but the first one we made was too big to hold for us, so it was too big for the children and their bags. So we made a new one that was much smaller.

Feedback
We got the feedback on B.O.B that the emotions were not that elebrative, the only two we had were sad and happy. Children have more emotions than only those two.

The feedback that we got next was that we actually have 2 concepts in one product. The first one is the 'Token idea' where children in the class can say if they find an exercise easy or hard. The second concept is the showing of the emotions of the child and if we were to go for this concept we should elaborate more emotions.

What is the next step?
Our next step is to choose one of the two concepts. We decided to further develop the idea which involves emotions. We choose this idea, because we were curious about this specific influence on education. We also thought that this concept offers a lot more design opportunities then the other concept.

Prototype 4

The concept
This concept was the last one before our final concept. We decided using the feedback that we got on prototype 3 that we should go on with detecting and registering the emotions of children. We especially choose for detecting and registering the emotions, so that the children will be less influenced by external factors in contrast to just asking how children feel. Factors as, do you like the person or being able to make yourself clear about how you feel when it isn't actually the right time could affect the outcome of such question. We also thought it would be practical that both the parents as teachers, can see the emotions the child indicates. That way we prevent some miscommunication. The product that we made was only a small part of the whole concept. The product that we made was a simple cone shaped doll with a ball on top. This was a simple doll, the doll has a lamp in this head. When you perform an action with the doll the light will turn on in a certain color. The colour would be chosen according to the emotion. We did this in such a way that the negative emotions get weakened and the positive emotions get strengthened. After some time (10 minutes) the light slowly fades. This is to support the child in processing his emotions.

How did we get to this?
We got to this concept because our coach pointed out to us that we had 2 concepts in one products and that this would clash and we had to make a decision between two different concepts. Monitoring children at school or at home and eventually we chose for monitoring the children at home. We also altered the shape a bit in order to make it less like a person because this would become too subjective in our opinion.

Why did we make certain decisions?
We chose this concept because the emotions of a child has a deep impact on their schoolwork and young children are also still in the process of learning how to deal with their emotions.
We decided to make this prototype into a wizard of oz. This was a very important decision because this meant we would focus more on the concept and less on the technical part of the concept. Since the concept is the most important aspect of our product. This also gave us the room to focus on user aspects instead of functionality.

Feedback
The feedback that we got on this concept was that our second user tests, which was about trying to find out what physical interaction was the best to express an emotion, was not really reliable, because we didn't ask users from our target group. The user test we did before the midterm Demo Day was with people of our age [Image 14] [Image 15]. Not with children of the age 7-8 which can have different perspectives and act more spontaneously. Feedback on the whole concept was good, they found that it was very socially active now. The feedback that we mostly used was 'what is the motivation of the child to use the prototype'. We had to think of a feedback mechanism that the child would trigger to use the doll. The first thing we thought was light, when we did a little bit of research we found out that light has influence on our state of mind. We incorporated this in our prototype. We developed our prototype 4 after the midterm Demo Day. Also we tried to get a usertest going with children of age 7-8.

What is the next step?
We were trying to arrange an usertest with our actual users after the midterm Demo Day, because then we can determine our mapping for the emotions. We wanted to do a usertest and find out how the mapping would be, and if the children would have a motivation to use our product. Also we would like to make an appointment with teachers we went to in the observation.

Image 14

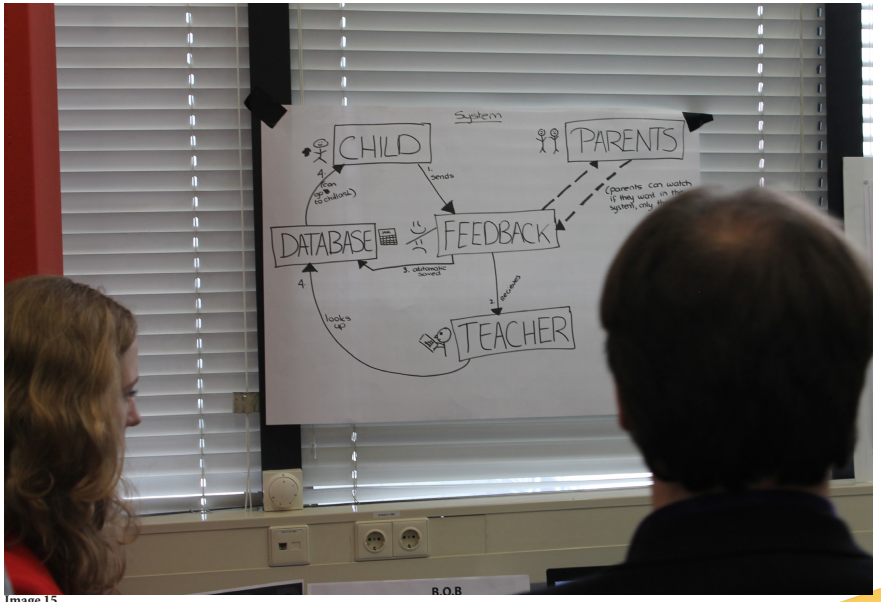

Image 15

Busness Canvas Model and Usertest

Business canvas model

Making a business canvas model was something we decided to do, because we wanted to investigate the way our project would be used. We also wanted to investigate who would buy what. This was also very useful for researching what the total product will cost and if the party responsible for the buying is willing to pay the amounts of money needed.
The most important reason why we wanted to do this is because we wanted to learn who our clients, our key partners and what our revenue streams will be. The most important for us was setting straight what our key activities, key resources and value propositions were [Image 16]. As a extra we came up with the idea to only use the subscription fee (which will be paid by the government) to subside for the cost. The use of it will mostly be in the future where we will use this when making important decisions in the future. We now have the basics of our product totally clear for ourselves. We know who is going to pay what and who will be the user of what part of the product. This is an easy point to work out all of our future concepts.

User test 3

We chose to do this user test because of two major reasons. We wanted to know what children thought about our design and we wanted to know if children would interact in the way we thought. We weren't sure if their mapping was the same [Image 17]
The user test has been held on the the Korein Kinderplein childcare. We asked each time two children some questions about emotions and to interact with our prototype.

We saw some clear patterns here too.
- Happy, mad and sad are expressed in very similar ways by every child.
- B.O.B. should look more like a person, because why would you talk to a lamp?
- The lamp lighting up stimulated children to interact.
- When asked why they have a certain emotion the cause most of the times is mentioned in the first sentence.

This will be very useful for finishing our product and finetuning the interaction with B.O.B.. We can now build the final prototype according to the wishes of the child. We also now know what sensors we need to put where.

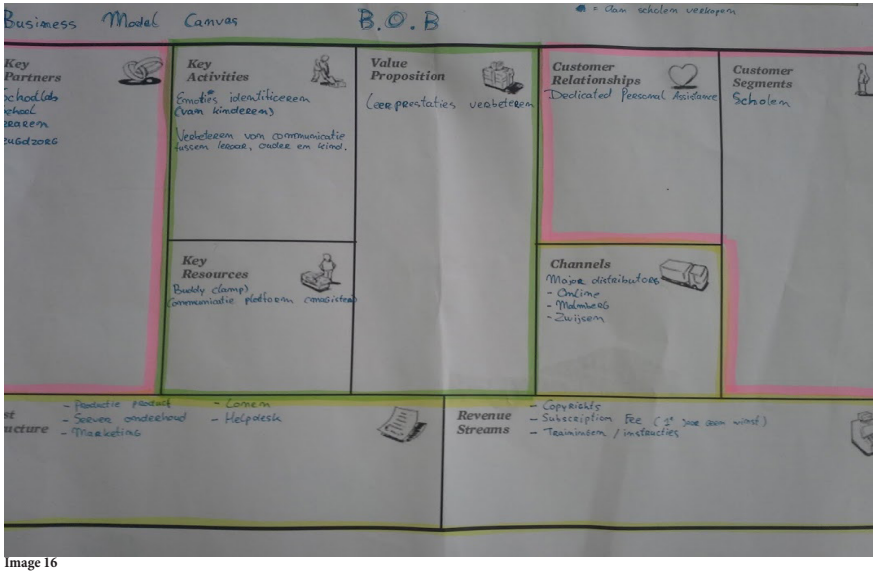

Image 16


Image 17

Prototype 5 (Final Prototype)

The concept

This is our last concept [Image 18]. We made a doll which had broader shoulders and had arms. This is something that we changed from our last concept. Also this concept had extra options for clothing. You could for example make a fireman of him by adding a firefighter helmet and firefighter pants.
It still kept the basic functions of recognizing the emotions of a child. Also we still used the light to let them know we got the feedback and to help them process their emotions. But we also added two things. A speaker and a microphone. This way the doll could ask why they had a certain emotion and then record what the child answered.

How did we get to this?

We did an usertest and what we wanted to get from this user test is the way the children use the doll to let their feelings known. We found that they found Jealousy and Regret very hard to show, so that is why we decided to change the emotions. We have only the emotions happy, sad and angry, because even the youngest children knew what those feelings where.

We also did additional research and found that an emotion is a reaction on a feeling. The basic emotions are for example sad, happy and angry. The feelings that trigger these emotion are for example, being jealous, being proud or having regret. For example a kid is jealous and because of this feeling he gets the emotion sad. Not only did the children cuddle, punch or comfort it, they also talked to the dolls. That is how we came up with the talking part.

Why did we make certain decisions?

Our prototype now has arms and shoulders, because we found that the children thought the doll we had in concept 4 was too abstract. So we added arms this speaks more to the imagination of the children. We added the function of asking the children about their emotion because, the emotion they have is angry, but the underlying feeling can be jealous or proud. This is what we wanted the parents and teacher to read, when it is something serious they can ask the child what is going on.


Image 18

Final Concept

Our goal is to create an triangular relationship between teachers, parents and their children to be able to decide what is best for the children. We want to create this special relationship, because nowaday there are on most schools only one or two parent meetings in a year. We believe that this is far too little, because the people which are (partially) responsible for the education of the child need to collaborate/ communicate more to be able to give children the opportunity to develop themselves to the fullest.

Own research and research from others have also proven that teachers have need for this information. Research done by the American Federation of Teachers (2007) agreed that there should be a close relation between parent and teacher, they say;. "Many teachers say that they don't often receive information from parents about problems at home. Many parents say that they don't know what the school expects from their children-or from them. Sharing information is essential and both teachers and parents are responsible for making it happen. Here are some steps you can take to develop a strong partnership with your child's teachers" [2]. Also during an user observation we did on a primary school, teachers said "I would like to get some more insights in the home situation of a child, because now children only get visited once when they are in the first year of school and this report stays with them throughout the whole 8 years." We try to make this connection by offering a service which consists out of an online platform where parents and teachers easily can communicate and a product which give children an way to express their feelings. The data that is collected from the product will then be visible for both teachers and parents. The emotions are indicated by a physical input on the product. This product should become a childs buddy.

Our product can register emotions. The emotions that our product can register are angry, happy and sad. These are the basic emotions children of all ages understand and experience and we think are important factors which can influence the school results [5]. The causes of these emotions can lie in different feelings. Immediately after this input there is a colored light shining from the head of the doll. The color of the light depends on the emotion of the child. We try to pick this color so we weaken bad emotions and strengthen good emotions. The doll also has a speaking function. It can choose from a couple of prerecorded lines to ask the child to explain why they are sad. We found at the usertest that children always start a sentence with; "I am angry, because he hit me." After that sentence the children will only explain more about their problem. The information the child says is written in the website, which parents and the teacher can read. Each text can only hold up about 100 words. This way the text is not to big and the parents or the teacher see if their really is a problem and then could ask the child what has happened.

At first the light shine bright but after 5 minutes the light slowly fades. The ideal situation would be that the child goes to sleep after or during the fading of the light. The color of the light depends on the emotion the child expresses. If it is an good emotion like proud or happy, the emotion gets a colour that enhances the emotion. If it is a bad emotion like anger, regret or sadness the light gets a color that tries to counter the emotion and helps the child with processing their emotions. Don Campbell, a researcher on the University of Toronto Scarborough, had done research (2014) on what influence light has on your emotions. It appears that bright light enhances your emotions.[3] The university of Liege has done a research on the effectiveness of the difference in color of the light on your emotions, they say; "The results of their study, published in Proceedings of the National Academy of Sciences,show that the colour of light influences the way the brain processes emotional stimuli."[1]

When the child has indicated which emotions was the overall emotion of the day, there is a signal sent from the doll to the website. On the website the teacher can see an overview of the emotions of the child. Which you can see in the picture underneath here. The teacher sees which emotions are mostly indicated, but also sees an overview of the whole month. The overview of the month is there to see a pattern of the emotions. Maybe a child is always sad on a wednesday, then the teacher can ask why that is the case.

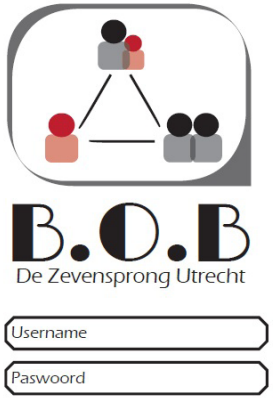

Image 19

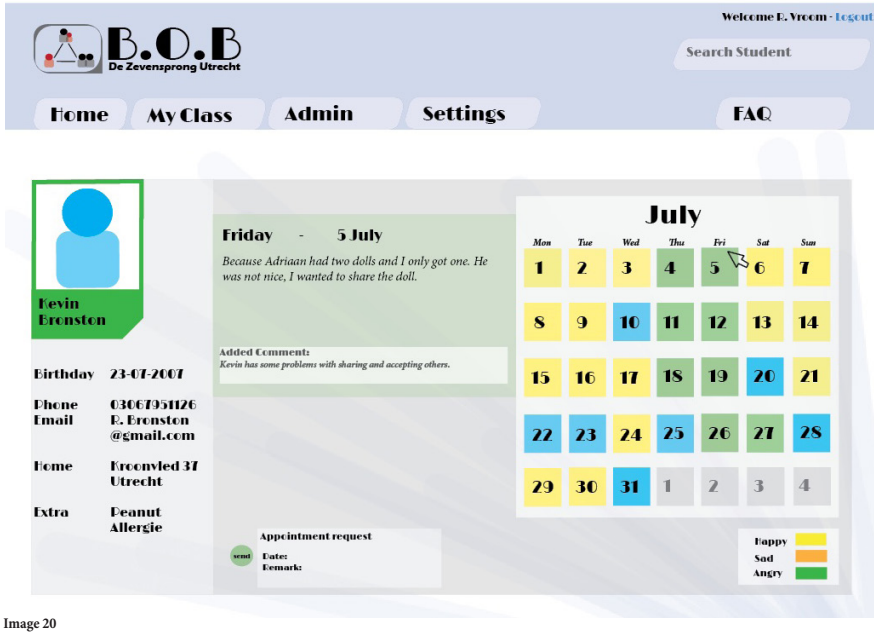

Image 20

Not only teachers have the insights in a child's emotions, parents also are able to see what emotions the child indicates [Image 19]. Parents have then the possibility to add some information about the situation of the child and to communicate easily with the teacher [Image 20]. This way their is not only a fast communication between parent and teacher, they can now collaborative choose what is best for the child.

On the platform there are also options to put documents of the child, reports, grades and homework [Image 21]. This is because than only one platform is needed to have all the information about the child. Parents no longer have to gather bits and pieces of information.We think this will work, because of the feedback we got from the user tests that this would be handy.

The next challenge was; how do we motivate the children to give feedback, without it becoming another boring task? That is why we thought of the feedback and the motivation for the child to indicate their emotions. This was one of the most difficult parts when making the product. The solution we found in a light that changes colour according to your emotion and a speech function. Which make it feel like a living doll straight out of a fairytale.

The platform is based on other platforms that schools already use (Magister,Questi, Schoudercom). Our platform has the same functionality as these platform, but we also added the function of the emotions indication that teachers can see in a graph. Also there's an option to make an easy connection between teacher and parent.

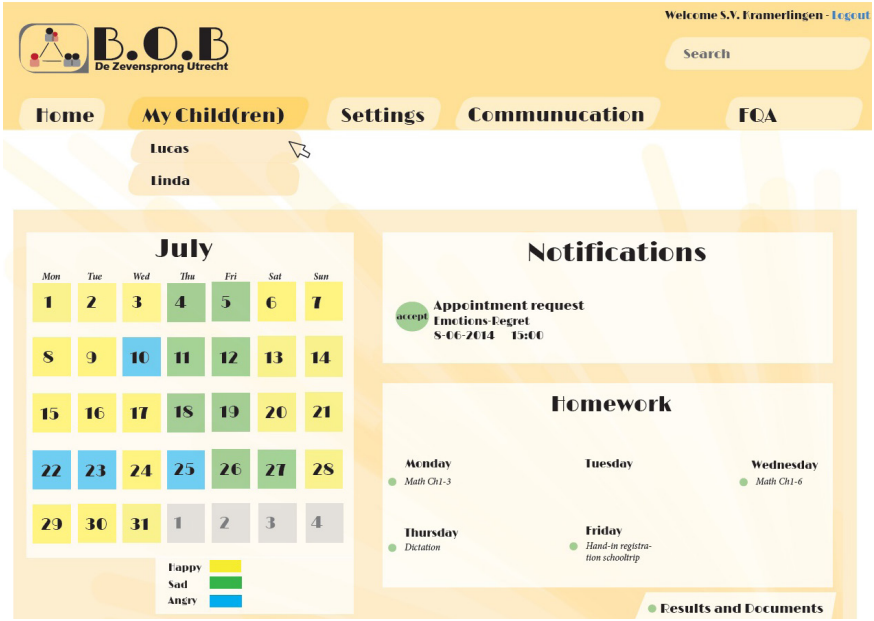

Image 21

Technical aspects

What we made for the Demo Day is an almost working prototype. We wanted to show our concept and how the product that the children use would work [Image 22]. For the light in the head we used a light of philips that can change colour using a remote control. In the real working product this would be six RGB LED's in the head that light up when a child has interaction with the prototype. The sensors that would be in the prototype could be just pressure buttons, but also an accelerometer to measure how the product moves in the space. When it is lifted then this sensor knows that it is being lifted. We did not use this in our prototype, because programming these sensors is a lot of work and almost impossible to do in the time we had left.

What we did have in our product is a pressure button that activates the speaking functions of our doll. The speaking function has 3 options to play, for every emotion he can ask why you feel that way. Then the child is going to speak and say what is bothering him, he will tell a story which is going to be recorded and send to the website we have made. The website transfers the speech into text. This would make it easier to read for the teachers and parents.

The recording and transferring function is something we have not made, this because we haven't got a working website to put it on. The recording could be done by the speaker that also transfers the question, it could record the speaking of the child and then send it by Wifi to the server of the website. Nowadays there's a lot of technology that transfers speech into text, so we need to get our hands on this kind of program and implement that into our website.

Our product should be steady and not easily breakable. That is why the structure of the doll is made out of styrofoam which is not easy to break. Then to make the doll softer we used recycled plastic. The head of the doll is a round hard plastic which protects the lightbulb from breaking. With the real prototype we would use led lights which are much more flexible and smaller. So then soft plastic can be used for the head. Then to make our doll a little bit more lifelike we used fabrics. White fabric to cover the base of the doll and denim trousers to make it look like a person. For the boys we have a hat and denim trousers. For the girls we have a bow and a tutu.

We calculated the cost of the product and the cost of our product will be around 15 euro's. We know this because we had to build the first prototype ourselves and we monitored the cost. With mass production we expect this doll will be around 10 euro to produce or even less. We found out that the parts of our product are cheaper if you get them in big amounts. This also counts for the fabrics that are being used with our product.

We also have a website, this will need a server to let the website run. For one primary school with 200 children we estimate than the server will be around 4000 euro's. Other costs like electricity are hard to calculate, but those will also be in the costs. We got this number after doing some research about the costs of servers [8].

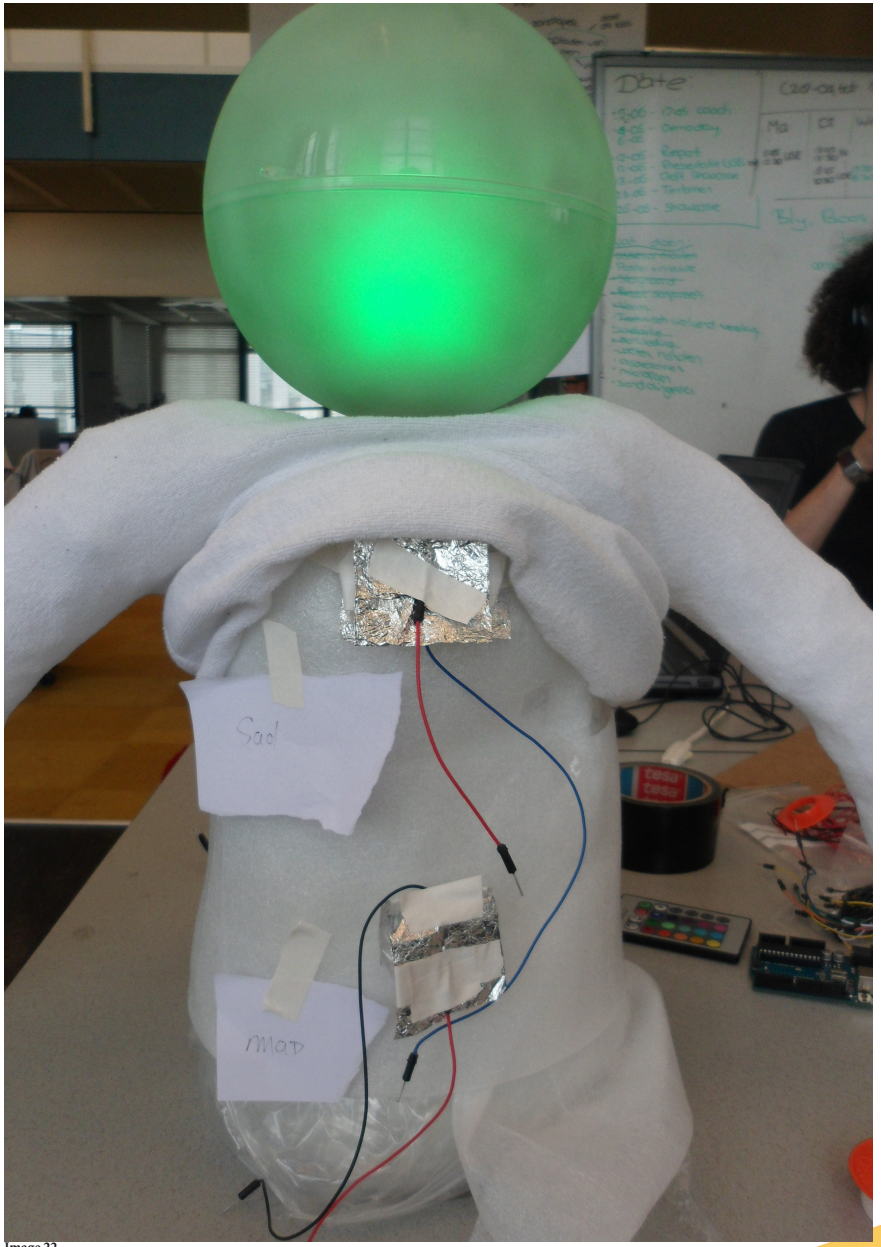

Image 22

Conclusion

Our project aims to provide teachers with insights in the home situation of children. This concept sure has some difficult ethical question regarding privacy. For example, does a child know what the consequences are of their teacher knowing how they are feeling [Image 23]. Also other questions will arise. Does a teacher need to take some responsibility for the raising of the child or moreover, does a teacher in the first place have any tasks regarding raising children. These are questions which arise, because he/she is one of the key adults a child has to deal with while growing up. Not even mentioning that a teacher is one of the adults a child is seeing the most during the day, sometimes even more than their own parents.

Could we really improve the education by changing the way we teach? Does introducing new teaching techniques improve the school results from the children? While doing research we came across an article about the influence from parenting on academic results [9]. Research shows that children whose parents show great interest in the school career, help them with doing their homework and have an actively relationship with the school tend to have better academic results.

This because this shows that parents value their children, which again is an extra stimulation and help for the child to gain the best academic results. So maybe we need to look into other areas, such as raising children to get a better understanding in how to improve the education (system).

Our concept has some ethical difficulties, but we think that it is important to think ahead. it is already normal that parents and teachers know everything about the child regarding school results, absence and misbehaviour. All this information is shared between themselves to determine what's best for the child. We think that our concept can contribute to this goal by also offering insights in the emotional state of the children. The teachers can then adapt their lessons if necessary, because emotions have a great impact on the school results of children. They could also contact the parents if he/she believe this is the best for the child.

Image 23

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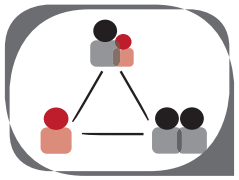

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