Half Ice No Sugar

Team Report

Zhi Han Mo

Sean Lim Han Ming

Fardeen Rashid

Yun-Tung Shen

Semester 1, 2020

Index

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Zihan Mo - 44482570
Sean Lim Han Ming - 45054965
Fardeen Rashid- 44848998
Yun-Tung Shen- 44482691

Physical computing & Interaction Design Studio Final Team Report

12 June 2020

Team Problem Space

The increasing advancement of technology has led to an increase in mankind being more tech savvy. This increased exposure to technology is causing heavy reliance on technological products which reduces the need to use our fine motor skills. This has put the younger generation at risk of lagging behind in achieving the learning milestone. The current technological era was leading to the loss of more traditional childhood pursuits that plays a crucial part in motor skills development.According to researchers, 85% of school age children are kinesthetics learners, this means that kids learn better through hands on learning rather than explicit learning. Therefore it is important for resources and development in children's learning activities to be focused on developing their fine motor skills.

Reflections on the concepts

In consideration of the problem space, our team has explored different possibilities of assisting children to have a more engaging and fun learning experience. According to the problem space research, children learn better by doing hands on activities rather than through traditional learning. Fine motor skills play a very crucial part in performing everyday tasks, it is important for children to practice and refine their fine motor skills.

Without the ability to complete these simple tasks using fine motor skills, a child's self esteem can suffer, their academic performance can be compromised and their play options become very limited [1].

Understanding this, as a team we determined the type of interaction mode that is most suitable for children and we have decided to simulate certain smaller movements such as pressing, shaking, colour recognition and dexterity.

These learning contents focus on incorporating multi-sensory learning that encourages children to use more than 1 senses to engage with learning. Each prototype utilises the sense of touch, hearing and vision to assist with children's learning experience. Learning contents provided for children will be accustomed according to their age, this is to ensure progressive learning as they gain new knowledge throughout their learning journey.

This article states that toys help to foster children's social and emotional development as toys provide lessons in sharing and cooperation. Toys also provide opportunities to develop children's motor skills. Playing with the same toy over and over again helps children to refine their movements over time [3]. Knowing the benefits of how toys are able to develop children's overall growth, we have decided to use a soft teddy bear as the physical form of the prototype. This prototype is suitable for our target user's age group and it is portable for them to bring it to any places, allowing learning to be accessible everywhere.

Insights and opportunities

Our team has explored the problem space by working on different learning contents. Each of us have gained useful insights, future opportunities and detailed consideration in our focus areas over the semester. Sean and Fardeen are focusing on colour recognition and audio output respectively and are working collaboratively on the prototype. Sheryl is exploring developing children's basic skills such as memory, whereas ZIhan is focusing on math and colour fields.

Sean's current concept only allows users to learn about colour, this was done by allowing the user to bring an object with a specific colour for Itsy. Itsy will use its colour sensor to detect the right colour, audio feedback will be provided to notify the user if the right colour is being detected. As users are required to use random colour objects for Itsy to detect the colour, future improvement of the concept might include shape identification to make learning more engaging and challenging for them. There will be progressive learning stages where children will first learn about colours, shapes and finally integrating both colours and shapes together. These learning phases will be implemented based on the children's learning progress. Itsy will have a resemblance of an artificial intelligence robot where it will be able to track children's learning progress through the mistakes they make.

Future Itsy will also be able to assist children with ADHD. Learning disability such as ADHD can make it difficult and sometimes impossible for a child to achieve the same result as compared to his or her peers. Having alternative learning approaches, strategies and tools can help children that are diagnosed with ADHD achieve their full learning

potential. Breaking tasks into manageable tasks based on each learning phase will be able to prevent them from being overwhelmed by the tasks load.

Fardeen explored audio output and physical interaction. For this aspect of the prototype there are many future opportunities. One feature that would be really interesting to see in the future is to have voice detection built into ITSY, so it can understand the children's voice and help them speak more clearly while giving auditory prompts like a virtual assistant such as Siri, Google Assistant or Amazon Alexa.

Contextual voice output can be incorporated with all the other features from the other team members. Instead of it see showing text it can give realistic voice prompts which the children can follow and even talkback.

Sheryl was exploring the problem space by allowing children to practice their basic skills and physical activities. The difficulties of the prototype may be reconsidered as it may negatively impact the children’s confidence due to continuous failure of the game. Furthermore, the tone of the prototype can be more friendly and encouraging and recursively practicing children’s basic skills may enhance children’s learning performance. Future opportunities of the concept is about the logical design of the prototype successfully presenting the concept and the games for children to further practice their basic skills can be seen as the future opportunity within the toy industry.

Zihan was exploring the problem space by helping children learn math, he found that it is difficult for children 3-5 to learn math through traditional learning techniques such as teacher-centered instruction, and the prototype helps children learn math through visual approaches which enhance kids’ understanding of mathematical concepts . Future opportunities of the concept can be adding more color and holes on the backpack which let users try more difficulty levels of the game. The learning math can also be incorporated with learning shapes by making different shapes of holes on the backpack, and users can put different shapes of blocks inside the holes which let them learn math, color and shapes at the same time.Furthermore, feedback of incorrect response or no response need to be reconsidered to make the prototype more accessible to the kids.

Reflections on the work under pandemic situation

Form of exhibition

As compared to previous year’s exhibition, this year’s exhibition was completely different due to the current pandemic. This caused the entire cohort to be deeply affected by the pandemic. Despite the unfortunate situation and the limited resources that we currently have access to, we managed to pull through together. Difficulties such as technical issues

and short exhibition time prevented us from getting sufficient feedback from the visitors. Feedbacks given could be further elaborated if visitors could experience and engage with the prototype in first-hand.

We would like to thank the people who have taken the time to visit our discord channels and looked at what we have achieved through the semester. Feedbacks given did help to boost the morale of the entire team.

Difficulties to Access to our main target groups

User testing was quite difficult to do as for the majority of the semester as we are not allowed to visit our families and friends, furthermore, our target audiences are of a younger age group. Despite not being able to test with a specific target audience group, Fardeen was able to visit his cousin once the restriction was slightly lifted and Sean, Zhi Han and Sheryl were able to gather some feedback through online calls with his friends. This allows them to gain some feedback and perspective on how users might react and features to improve for their prototype.

For contextual inquiry, we tried to maximise every resource we have and were able to gather sufficient data through online interviews and online Youtube Videos. Even though we are working on different prototypes, having similar target audiences allows us to share information regarding data we have collected from the various methods we have used for contextual inquiry. This is to ensure that we are on the same page to provide an engaging learning experience for our target users.

Team communication

The ongoing pandemic has definitely imposed a challenge in regards to team communication. It took quite a while for everyone to grow accustomed to the new method of communicating through online platforms. At the beginning, the communication was not as fluent and frequent as it would have been in person. However, we did improve by the end of the semester by having frequent zoom meetings regularly. Having social platforms such as Facebook messenger and Slack did succour in times of this stressful period.

We managed to keep each other on track despite only meeting each other for the first four weeks but the friendship that flourished throughout the semester was what kept us going as a team during this pandemic.

Workshop support

It was quite frustrating for the team at the beginning to tackle the uncertainty. When developing the prototype, the team does not have full access to the workshop to design a better and higher fidelity prototype. However, the team shared our resources and supported each other and we did manage to deliver our best prototypes with limited equipment. The team members also actively reached out to the teaching team for feedback and suggestions to further improve our project. The teaching team was supportive during this semester by guiding us into the right direction.

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