

## DESIGNING TOGETHER: “VISION 2020: CO-DESIGN PROJECT”

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### INTRODUCTION

This paper aims to contribute to the growing body of evidence showing that design can contribute positively to healthcare experiences and to improve health outcomes (Jones, 2013). In particular, we unpack our experience of a ‘design for health’ co-design project carried out between different institutions: Otago Polytechnic, the University of Otago, and Tahuna Intermediate School in Dunedin New Zealand; and between the different kinds of knowledge held by occupational therapy, optometry, design, students/pupils, teachers/lecturers/professors, and parents.

The concept of ‘design for health’ has been foregrounded as something that requires a co-design approach. Design for health aims to enhance health outcomes and healthcare experiences by improving products, services and systems through design-led, human-centred approaches (Bill, Reay, & Collier, 2015). In particular, it aims to:

...better position users’ ‘voice’ in healthcare design and delivery; develop ethical frameworks to more effectively support healthcare design; develop and implement strategies to integrate design-led methodologies, methods and processes into healthcare products, services and experiences...and to use design-led frameworks to better support learning and transformation within healthcare organisation”  
(Bill et al., 2015, p. 3)

Design for health starts with a group and not just an individual (Sanders & Stappers, 2008). Gone are the days of the lonesome design hero. In recent years, the product design process has shifted from individuals to teams, and from beautifying objects to putting end-users in the centre. Further steps have also been taken where rather than designing for the user, the importance of designing with the users and specialists is being emphasised. This way of thinking and collaborative design process has been referred to as ‘co-design’. Opinions vary around who should be involved, and to what degree, in a co-design team. However, co-design aims to involve both trained designers and non-designers equally in the creative process (Sanders & Stappers, 2008).

### VISION 20/20 CO-DESIGN PROJECT

The question we were working with at the start of this project was the following: how can we develop an effective vision screening system where school age children screen each other’s vision? The concept of child-to-child vision screening was a novel idea that arose from an occupational therapy fieldwork placement. In the placement, two occupational therapy students took a vision screening toolkit into a secondary school context. They did this as a way of raising awareness of visual impairment and they organised the activity so that the children did their own screening. Following the success of this project, it was hypothesised that this process might be a useful way of doing vision screening with children (Butler, 2019).

The hypothesis was developed in response to New Zealand's current vision screening system where children are falling through the cracks (Butler, Drummond, Niimi, Ogbuehi, & Parker, 2020). For a system to be effective in screening all children across New Zealand, the system needs to be simple, cost effective and reliable. Working towards embedding a vision module in the science curriculum, to enhance student's awareness of vision and then screening each other seemed to be an ideal answer to these issues. Ethical approval was granted by the Otago Polytechnic Research Ethics Committee in September 2019 Number 822.

The project team was expanded in 2019 to include a Professor of Ophthalmology/Optometry at the University of Otago, Occupational Therapy and Product Design senior students, the Principal Lecturer of Product Design, and the principal, teachers and pupils of Tahuna Normal Intermediate School (a public school attended by pupils aged from 11 to 13). The team was lucky enough to attract funding from the Participatory Science Platform, which has a philosophy of embedding science processes into citizen projects.

In 2019, a dedicated Occupational Therapy senior student took the project lead and worked extensively with the Product Design senior student and Tahuna Intermediate teachers and pupils to develop a number of vision screening prototypes. The vision screening kit was developed with input from the Senior Optometry Lecturer. The kit consisted of a series flip chart and result recording booklet. The inclusion of the ophthalmology/optometry specialist on the co-design team was key to ongoing development of a clinically valid prototype. Each of the prototypes was tested with the school teachers and pupils for feedback and further iteration.

There was extensive dialogue in the weekly team meeting about how to record the results and to inform parents and guardians of children. At this point, we had results from all 270 children in Year 7. Ensuring follow-through of particularly the children with a failed screening became an obvious challenge.

By the end of 2019, the student pair, along with the lecturers, had visited the school seven times and had developed a dozen iterations of the vision screening kit. The students at the school had seen the iteration and improvements made over time. They commented favourably on their participation, and how they "enjoyed being heard and seeing improvement made so quickly in the next visit."

Some examples of the student feedback included: make the pages thicker, make it easier to navigate, make the instructions simpler, use colour coding for the results booklet and flipchart, work in groups of three instead of pairs. Of the 288 children who were tested, 24 needed to be referred to an optometrist. Of the 24 children who were referred, seven of them were identified as priority learners in the sense that there were below or well below other students in the areas of literacy and/or mathematics. All of these results, and the enthusiasm of the children and teachers, encouraged the team to keep working towards developing workable solutions.

## THE CO-DESIGN PROCESS

A design process usually begins with a divergent exploration process (British Design Council, n.d). In this research, the Occupational Therapy Professor and her students had a vast range of information gathered from a divergent exploration to understand four key areas.

1. Vision screening is problematic in many countries (Burnett et al., 2018) and this frustration is echoed in the national vision screening process.
2. An understanding of international precedents in various vision screening methods.
3. Identification of a vision screening toolkit developed in the UK and produced by the Pocklington Trust (the Eyes Right Toolkit) to be used by laypeople with older adults. The Occupational Therapy team had also gained copyright permission to replicate this toolkit.
4. The literature review indicated that the child-to-child vision screening approach was a genuinely novel approach.

The occupational therapists identified the idea of child-to-child vision screening in a seeming epiphany. However, in hindsight, this light-bulb-moment concept was actually a result of what is known as divergent research and design thinking. It arose from intensive research, working with the end users at the high school, and creative thinking in the previous project (Butler, 2019) and also various other settings.

Often, it seems that the co-design process involves a designer who comes on board to run workshops that sow rows of sticky notes with ideas about what else can be done. In this case, such a process would have been only to the benefit of the designers to get up to speed with the knowledge that the Occupational Therapists already had. Instead, it seemed more appropriate for the designers to listen to and respect the Occupational Therapist's prior experience and knowledge as a starting point. As a result, in the first few months of this project, the designer's role in this project was to develop tangible prototypes through communication design and embedding various areas of importance for all parties involved.

In co-design, the premise is that everyone is creative. The development of the Vision 2020 project highlighted how educators could also be effective collaborators with their students in project-based learning. There was a sense of equality and generosity in the team that could recognise the innovative nature of the students' idea about child-to-child vision screening. One of the team later reflected:

*Great ideas don't come from professors and teachers. They come from the people (and students) that we work with. And it's actually a joy when you can inspire students to be confident enough to come up with ideas like this that can morph into something bigger.*

This project is a fine example of Occupational Therapists' creativity at work.

## THE VALUE OF PROTOTYPING

By the end of 2019, the students involved in this project had completed the development of the vision screening kit for the school. The kit was created to a high standard, and it was a beautiful product. However, we gradually became aware that this prototype was filling purposes that we had not expected. It was acting as an object that enabled thinking about the significant problems associated with vision screening. The development of the prototype prompted ever more in-depth conversations. It rapidly created a situation where the team could genuinely include school pupils and teachers on a level platform.

The development of the prototype moved the whole team to a place where it became possible to articulate the values underpinning the project. These values were about wanting to meet the vision health needs of children. The student occupational therapist put this into words when she expressed her commitment to working with children:

*I've just got really passionate about wanting to help all these kids as much as possible and enthusiastic about learning to help with their vision. I'd love to stay involved and I hope that the project keeps carrying on as long as possible.*

In this case, the use of a prototype appeared to act as a participant in a play that 'brings together user and expert mindsets and helps move healthcare design from what is to what could be' (Bill et al., 2015). The prototype in this project was incredibly effective as an object that helped to refine and clarify the values underpinning the project.

At one stage, the group started to tell stories about the different ways that we were learning to approach what we were doing. One story was about the three stonemasons who are asked what they are doing. The first stonemason says that "I'm chipping these stones to make my living"; the second stonemason says "I'm chipping these stones to be the best stonemason in the country"; and the third stonemason says "I'm chipping these stones to make a cathedral."

The story of the stonemasons described how the team felt united around a single issue. There was no longer a sense that representing our individual disciplines was the most important thing, and neither was there a sense that individual egos were important. Instead, there was a trust that everyone in the team was answerable to the same issue—which was ensuring that children received vision screening.

## UNPACKING THE WICKED PROBLEM

At another level, the prototype toolkit acted as a type of 'Trojan horse' (MacDonald, 2013, cited in Bill et al., 2015). It smuggled a complexity of thinking into what had seemed like a simple goal.

As we worked through the various iterations of the prototype, we encountered problems. For example, we became aware that parents were not taking their children to the optometrist even when they got a clear message about the screening process. This difficulty with communication between home and school is something that teachers are already clearly familiar with:

*Parents don't like to say, well actually it's lack of money or lack of time. Because if they say it's lack of time, then it looks like they don't actually care about their child. But then, we say "how come you haven't gone? You said there were no barriers." And then, they say "well we haven't got round to it, we haven't had time." So clearly, time is a barrier for them, and they are trying to save face when they are speaking with you. Trying to get an accurate picture is really hard (teacher).*

Further in-depth interviews with parents revealed numerous issues with the current system in ensuring that children get glasses when they need them. For example, parents have problems getting time off from work to take children to optometrists. They also have significant levels of mistrust of optometrists, partly based on less than happy experiences. It is also partly based on the difficulty understanding the business model of optometrists, which leads to every optometrist offering different things. There were cost issues and a lack of awareness of the subsidy available to community services cardholders. Parents were also aware that glasses are inconvenient and potentially stereotyping for the children.

Over time, the vision screening prototype began to help the team to map the user journey. The team met weekly, and the conversations that unfolded following each iteration of the design began to highlight the areas for improvement and uncovered the surface of what increasingly looked like a Wicked Problem (Buchanan, 1992).

Our current understanding is that the user journey (and barriers) for a child who needs glasses at age 11 looks something like this:

1. Vision Screening occurs once before school and once at age 11-12 in school.
2. Children absent on the screening day at school will miss out.
3. Some schools might refuse the vision screening, for example if they have an arrangement with a group of optometrists.
4. Results are sent home, but parents often say that they do not remember getting them.
5. Teachers have little understanding of where to access the results.
6. Parents are relied upon to take children to optometrists, but there are many barriers to this happening.
7. Even when children get glasses, there are barriers to wearing glasses, because they are self-conscious about wearing them, or because they get broken or lost.
8. Other barriers to wearing glasses include the fact that parents, teachers and children may not be aware of the importance of wearing them.
9. Teachers do not routinely remind children to wear glasses.

This project uncovered various touchpoints where further consideration and co-design with a broader group of specialists and participants may help to fill in the answers. We know now that other stakeholders will need to be drawn into this collaboration. It is important to map out the key stakeholders for vision screening in a line that extends from children to the Ministry of Health. It needs to include the Vision Hearing Team, doctors and paediatricians. Ultimately, forming such collaborations can help to ensure that children's vision gets assessed, appropriate glasses are provided, and children wear glasses at appropriate times.

However, at a deeper level, the development of the prototype toolkit began to help us to penetrate the various contexts of the institutions in which children's problems are situated. These contexts include family, school and health, and all of these contexts are characterised in different ways by hierarchy and dominance (Foucault, as cited in Crampton & Elden, 2007). Clearly, the children's need for vision screening is not going to be met unless we can find ways to unpack the tensions between these institutions. It is a genuinely 'wicked problem' (Buchanan, 1992).

## CONCLUSION

This co-design process resulted in three key findings. Firstly, having experts from across field in co-design process meant that the project progressed at an incredible pace. At each potential stumbling block, experts presented with validation and skills to progress the project.

Secondly, this project has imparted key learning for the 288 intermediate pupils about the importance of eye health, and repetitive testing. Pupils commented about how they enjoyed being heard and their pleasure in seeing improvement being made in the next iteration. Hopefully, this helps them to understand the need for deeper thinking and that the first take is never perfect. Lastly, the prototyping and testing in large groups acted as a tool to uncover a Wicked Problem as well as to gain media attention and funding. As a result, the project is now set up to tackle the wicked problem with a broader stakeholder, and prototype results and feedback data from the co-design team of approximately 300, including the parents of the pupils.

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