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RESEARCH ARTICLE

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Navigating complexity in design for health internships to enhance student's real-world learning

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ABSTRACT

In this paper, we reflect on two internship-based learning opportunities at a New Zealand-based university for design students to engage in authentic, real-world experiences in a design for health context. We present three hospital-based case studies as examples of the projects offered to students through Work Integrated Learning (WIL) internships and Summer Studentships (SS); a medication information leaflet, an information resource for women interrupting a pregnancy due to medical reasons, and a patient journey video and oral health resources for a children's community dental service. Facilitating these real-world opportunities for design students has challenges, including building and maintaining connections and relationships with healthcare staff, careful selection of projects appropriate in scope and scale, managing and navigating expectations, and advocating for the value of design and implementation of students' design solutions. Despite these challenges, both internships offer design students an opportunity to engage in the rich and complex healthcare context, while working on meaningful design projects that challenge them to consider the value and impact of their design practice. It highlights the benefits of engaging design students in different ways to better prepare them for an industry that asks designers to navigate tricky contexts and deliver design solutions to complex issues.

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Internship; design student; real-world; design for health; authentic learning; engagement

Introduction

The future of design is rapidly moving beyond its origins as a form of craft (Norman 2016), among others, highlights that while we do not want to lose 'craft' from the field of design, future designers have the potential to bring a different kind of value – through contributions to the complex economic, political and environmental issues they are increasingly being asked to work on (Jaenichen 2017; Kiernan, White, and Morrissey 2021; Macdonald and MacLeod 2018; Peng and Kueh 2022). Consequently, there is a growing shift

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in university-based design students seeking to use their skills to do more than just craft 'beautiful things.' Yet, design curricula still prioritize the mastering of craft skills (Groeneveld et al. 2018; Norman 2016).

Design for Health offers a rich and complex context where designers can add value and contribute to meaningful change (Godbold, Lees, and Reay 2019; Peng and Kueh 2022). However, it requires design students to engage beyond traditional craft-based and technical skill-based design (Kiernan, White, and Morrissey 2021; Macdonald and MacLeod 2018; Norman 2016; Peng and Kueh 2022; Rowe, Knox, and Harvey 2020). Rather, it demands an appreciation and understanding of people and their needs, and putting these to the forefront (Godbold, Lees, and Reay 2019; Macdonald and MacLeod 2018; Norman 2016). Healthcare is rich and abundant with problems, providing many challenging but valuable opportunities for design students to contribute value they may not have previously thought possible (Reay et al. 2021b).

Through two internship-based opportunities at a New Zealand-based university, we introduced design students to the context of healthcare through several authentic learning opportunities. Specifically, we recognized the importance of 'understanding context' as the key first step towards successful collaboration between designers and healthcare (Reay et al. 2021b). As a design group with embedded relationships in healthcare, we partnered students with healthcare staff to support real-world projects. Through these Work Integrated Learning internships (WIL) and summer studentship experiences, students were exposed to and gained insight into the complexity of the bureaucratic, risk-averse organizations and systems of health (Jones 2013).

This paper builds on the learning of two previous undergraduate design courses (Potter, Reay, and Thornhill 2018; Reay et al. 2021a). The first provided students with 'a more person-centred, empathetic way of approaching design' through 12 healthcare visualization projects (Potter, Reay, and Thornhill 2018). The second provided final-year design students with an integrated, collaborative, and interdisciplinary design project in partnership with a healthcare industry partner (Reay et al. 2021a). Both courses aimed to expose students to the exciting possibility of design within a healthcare context. In this paper, we also draw comparisons with a more intensive full final year design studio course Integrated Studio (Reay et al. 2021a), which ran during the same period. In this paper, we reflect on the learning opportunities and success of three internship case studies for both the students and healthcare staff.

The learning opportunities

Work integrated learning (WIL)

Design students undertake a range of projects throughout their undergraduate degree. However, the majority of these focus more on building design

skills in a controlled environment. Through WIL, final-year communication and digital design students, are required to engage beyond the classroom environment and work in a design studio or consultancy on a real-world project (60+ hours). This is usually spaced out over the course of a semester in-between a student's studies. An aim of WIL is to provide students an opportunity to apply their learning and reflect on their competencies in a professional context (e.g. problem-solving, idea generation, design abilities and technical skills, communication and collaboration, understanding organizational roles, responsibilities and culture, professional processes and commercial realities).

Summer studentship programme

Students considering further postgraduate study are invited to apply for summer studentship scholarships in their final year of undergraduate study. The summer studentship is intended to provide students with an opportunity work alongside staff to gain introductory research experience. Normally this consists of ten weeks full-time activity (350+ hours) over the summer period. For those students who work with Good Health Design (our team), this is an opportunity to engage with real-world healthcare projects in a deeper and more focused way. As summer studentship projects have a significant research element to them, students can be better prepared for postgraduate studies. The summer studentship programme helps to establish a strong cohort of students who often maintain these relationships throughout their postgraduate studies.

Engaging students in design for health opportunities

External partners and collaborators often approach Good Health Design with requests for design assistance. As a team, we identify which requests may be suitable for internships or summer studentships, and then closely work with the external party to negotiate an appropriate project scope. We then advertise these through our website (https://www.goodhealthdesign.com/undergraduate-students), social media and via teaching staff. Potential students can browse past projects and apply for current projects via email with a portfolio, CV and cover letter. Potential students are selected and invited in for a brief interview matched up with a project that aligns with their skills and interests.

Students are normally given a brief to start, often provided by the authors as project supervisors, but sometimes through a supervised meeting with the 'client'. Students work on the brief in their own time, supported by regular (often weekly or fortnightly) progress meetings with supervisors, and with clients at key milestones, where feedback or advice may be sought.

When a project has adequate scope and scale to engage with end users (i.e. patients), this is normally facilitated by the client/stakeholders, who either already have ethics approval, or in the case of hospital-based projects, work normally falls under service improvement activities not requiring formal ethical approval. The healthcare partners have a good understanding of their context and are well equipped to support the management and facilitation of students' end-user interactions. Students usually finish the project with a final client meeting and presentation to a wider innovation and improvement team. At the conclusion of their internship/summer studentship experience, we encourage students to write up a project summary and reflect on their experience. This is often published on our website and social media, in part to acknowledge their work but also to increase the visibility of opportunities offered to future students.

Over the past six years, Good Health Design has provided 102 internships and 28 summer studentships. The following case studies were selected to help illustrate the types of opportunities offered to students. While we focus on a small selection of hospital-based projects, other projects have ranged from hospital-based to community-focused projects or involved collaboration with academic colleagues in healthcare-related areas.

Case study 1: medication information leaflet

Patient information leaflets have been well documented to aid and improve patients' understanding of their medication and support them to use their medicines effectively and safely (Hamrosi, Aslani, and Raynor 2014; Wongtaweepkij et al. 2021). However, current written medicine information is often overwhelming, text-heavy and unhelpful for patients (Hamrosi, Aslani, and Raynor 2014; Wongtaweepkij et al. 2021; Young et al. 2019). Written medicine information is often prepared by manufacturers who are bound by strict regulations and legal frameworks. Hence much of the information is only relevant and accessible to a prescribing pharmacist or healthcare professional (Hamrosi, Aslani, and Raynor 2014; Young et al. 2018). This case study was initiated by a pharmacist recognizing an opportunity for a more visual, patient-centred approach to medication information. This involved a series of three phases over a two-year period. The aim was to develop an infographic-based information leaflet for patients that communicated relevant information about what each medication was used for, the appropriate dosage, side effects and precautions. It aimed to provide information in a clear, visual way for patients with low health literacy or for whom English is a second language.

The first phase involved creating a medication leaflet for 'metoprolol' – a beta-blocker medication used to treat heart-related conditions. The intern worked to reimagine how metoprolol information could be communicated,

using both visual icons to communicate complex or medical concepts, and through the layout of visuals and text to help communicate information in smaller, more manageable sections (Figure 1).

The second and third phases were subsequently undertaken by new interns the following year, and built on the first phase through a) the iterative development of a library of visual icons to represent a range of medical conditions and side effects (based on feedback to be more inclusive and representative of a diverse population) and b) the development of the page layout, to be based on a modular system that could be easily edited and used by non-designers. This enabled the medication information leaflet to be 'templated' for use across a wide range of medications.

This project was well received by the healthcare staff who saw it as a great improvement for the benefit of patients. The metoprolol leaflet is currently available to the public through Health Navigator's website (a well-known NZ website for reliable and trustworthy health information – https://www.healthnavigator.org.nz/medicines/m/metoprolol/). The system of templates and icons developed in the second and third phases is currently undergoing user testing with consumers before Health Navigator can make a decision on their use (Figure 2).

Case study 2: supporting you through a difficult time: interrupting a pregnancy for medical reasons

The diagnosis of a foetal abnormality, in what is often a routine ultrasound examination, is a highly emotional and difficult time for parents, who may be then faced with a difficult decision on whether or not to terminate the pregnancy (Graham-Jones 2021). When faced with a diagnosis of severe foetal abnormality, many women will choose to end their pregnancy. This is a major

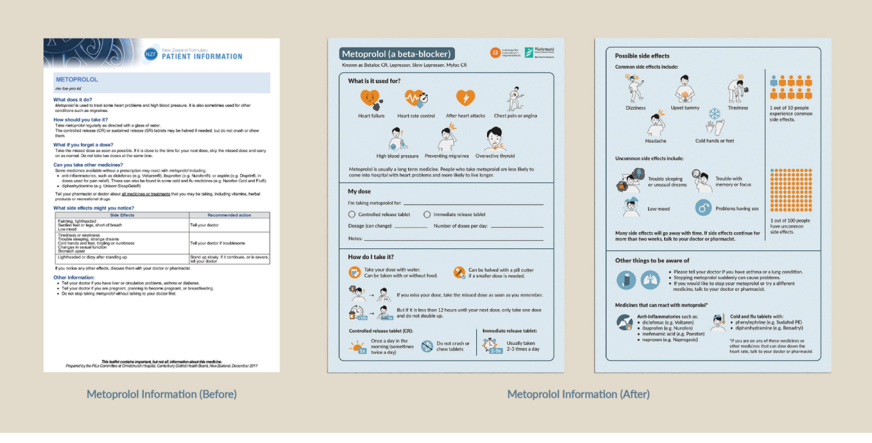

Figure 1. Metoprolol information leaflet – before (NZ Formulary 2017; left) and after by intern (middle/right).

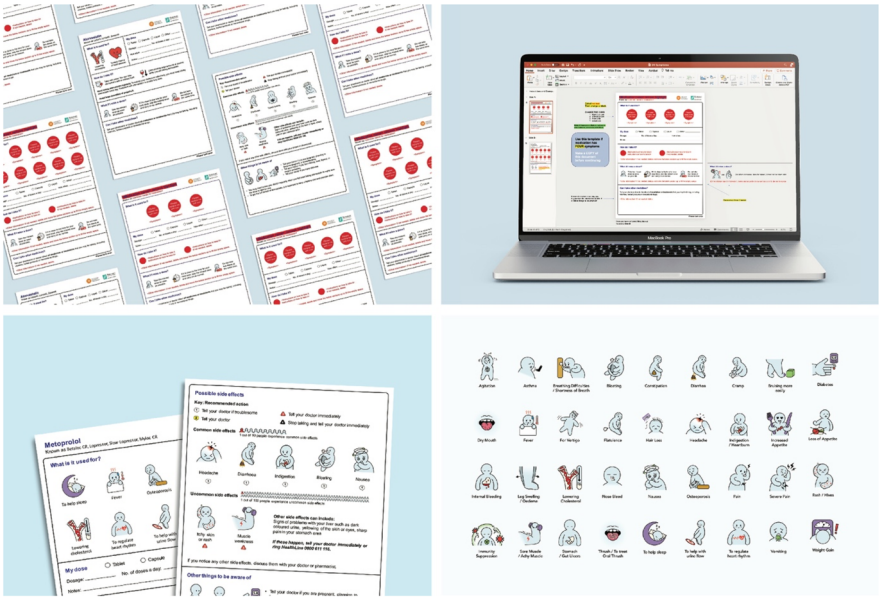

Figure 2. Medication information leaflet – (from top left) template design, PowerPoint file setup for the template, icons on template and icon bank.

life event that comes with a range of psychological and emotional consequences. This project was initiated by a Charge Nurse Manager at a local hospital who worked on a ward dealing with the interruption of pregnancy. After review, they identified the information women were given was inadequate, insensitive and unsuitable for their situations. The information given failed to acknowledge the challenges and difficulties women faced differed from the experience of an abortion for unintended pregnancy (Graham-Jones 2021). Consequently, the project aimed to provide a more sensitive, supportive and informative resource to better prepare a pregnant woman and her family for the difficult journey ahead.

An intern was supported to design the graphics and layout for the written information given to women. Clinical brochures provided to patients are often overwhelming, text-heavy and have a heavily corporate look and feel. The intern was tasked with presenting complex and challenging information in a gentle and compassionate way. Soft pastel tones and watercolour illustrations were used to help communicate information and to provide structure to more effectively space content throughout the booklet. Butterflies are commonly used to symbolize the loss of a baby – such as miscarriage, stillbirth, neonatal loss and multiple pregnancies (Embleton et al. 2016). This booklet used a butterfly both as a symbol of pregnancy loss (often representative of renewed life, and a new, beautiful and freer existence) and as a sign of hope that both the family and their child will move on to a better place.

The designed booklet was presented at a healthcare conference by the Charge Nurse Manager, who is also in the final stages of having the booklet approved and published (Figure 3).

Case study 3: children's dental service – patient journey video and oral health resources

Tooth decay is a leading cause of preventable hospital stays for New Zealand children (Ministry of Health 2016). In 2020, 41 per cent of children (by age five) had experienced tooth decay (Ministry of Health 2020). This was worse for Māori (indigenous people of New Zealand) and Pasifika children with 60 and 69 per cent of children respectively having tooth decay at age five (Ministry of Health 2020). Regular dental visits positively impact a child's quality of life as oral health problems may be treated early (Broadbent 2020; Ministry of Health 2016). Moreover, regular visits help to promote good oral health behaviours from an early age, which reduces the likelihood that a person will require costly dental care later in life (Boyd et al. 2022; Ministry of Health 2022).

A local regional children's dental service wanted to better communicate their services in order to build engagement with children and their caregivers around the importance of good oral health behaviours. Two design students were engaged in a ten-week summer studentship to explore and

Figure 3. 'Supporting your through a difficult time: Interrupting a pregnancy for medical reasons' information booklet.

develop potential solutions. The students worked closely with the service, including visiting dental clinics across the region, sitting in on appointments, and talking with children and their caregivers. They also visited a local school to get children's direct feedback on their designs. These activities allowed them to better understand the service itself, and importantly, the needs and experiences of the children and their caregivers. The first outcome was an informative video communicating key information about a patient's journey through the children's dental service. It used animal and tooth mascots designed to appeal to children and explained the journey through the service in a highly visual way. The second outcome was a set of fun educational resources to engage families and encourage the uptake of healthy oral health behaviours and habits by providing children with oral health-related education-based activities, missions, and collectables (Figure 4).

The patient journey video is currently being used on the service's website and in their dental clinics (see Figure 5). The service initiated a pilot of some of the educational resources, including a print run of 400,000 character stickers. This was a small, but significant step for the service beyond what they would normally invest in. The students had identified that dental therapists were using their own money to buy stickers as gifts/incentives when children visited the clinic. The students saw this as

Figure 4. Community children's dental service – (from top left) smile agents activity booklet, collectable mascot figurines, key Patient journey scenes featuring main characters mia and benji, service mascots 'finn the shark', 'toothy', 'spike the dinosaur' and 'peanut the dog'.

an opportunity to use dedicated, mascot-branded merchandise that helped to promote healthy oral behaviours. The stickers were well-received by children.

Reflections on engaging students in design for health projects – the benefits, challenges and learnings for students

Connections to real-world opportunities

Through our established healthcare connections and experience working on transdisciplinary design for health projects we have a unique opportunity to connect students to real-world healthcare-based projects. This exposes students to complex contexts, beyond those experienced in the classroom (Godbold, Lees, and Reay 2019) for the benefit of others (Godbold, Lees, and Reay 2019; Peng and Kueh 2022; Potter, Reay, and Thornhill 2018). By embedding design projects in a local hospital, students became excited about the possibility for design to be used in ways outside of their typical experiences (e.g. working in a design agency or freelancing for clients). In addition, healthcare staff were exposed to the potential of design and creative approaches to help improve healthcare experiences. Collaborating on the projects also supported the ongoing building of relationships with healthcare staff who were curious and interested in what design had to offer (Kiernan, White, and Morrissey 2021). Ultimately, working in a difficult context and on a project that may result in a 'meaningful impact on people's lives' (summer student) gave students a real-life experience they seldom got from undergraduate projects.

Offering for students

As with the Integrated Studio course, the internships and summer studentships required students to apply to be a part of the opportunity (Potter, Reay, and Thornhill 2018; Reay et al. 2021a). This meant there was an established desire, curiosity or interest from the student to engage in design for health. The internships and summer studentships challenged students to think more critically about the users they were designing for (Reay et al. 2021a). Students were observed to build soft skills such as interdisciplinary collaboration, communication with clients, navigating and understanding complex/tricky contexts, project management, and presentation of their ideas and solutions to stakeholders. These soft skills help better prepare students for work in tricky and complex environments and help them to be more 'match-fit' when they leave university (Peng and Kueh 2022; Reay et al. 2021a). The experience enabled students to be exposed to the potential of design within different contexts and challenged their perceptions of what design can offer (Tan, Hong, and Albert 2017). The success of design in health exposure through

the internship programme was evident with a third of our interns also applying for subsequent summer studentship opportunities.

Mentoring students through tricky topics

Healthcare can be a complex and tricky context to navigate. Design within health is increasingly attracting students looking for more meaning and purpose (Norman 2016). Past studies have reported students have found it tricky to excel within healthcare because they 'lacked knowledge of logistics/context', or because their taught skills often didn't adequately prepare them to navigate complex contexts like healthcare (Groeneveld et al. 2018; Norman 2016; Peng and Kueh 2022; Reay et al. 2021a). Being based part-time in an innovation and improvement team, the authors (CK & INK) played a key role in students' safe engagement with healthcare staff during projects, by helping to facilitate and manage any tricky or unexpected situations that arose, regardless of whether due to student inexperience, or a misunderstanding on the part of the healthcare staff (Potter, Reay, and Thornhill 2018; Reay et al. 2021a). Students found working in healthcare a 'challenging learning adventure' (summer student), acknowledging that good design in healthcare required them to be 'thoughtful and meticulous' (summer student). They reflected that while their experiences put them out of their depth in ways they didn't expect, it was an 'invaluable' and 'enriching experience' (WIL interns) that helped them think more deeply about 'who' they wanted to be. Given some topics can be sensitive, as in case study 2, we usually meet with the 'client' separately beforehand without the student and always present the project as an option (i.e. without the client and with time for them to consider) before they commit to the opportunity. This helps manage expectations with clients and gives students an opportunity to seek other options if they feel the topic isn't suitable for them. Students are always informed that they can come to their supervisor if something doesn't feel right, so it can be addressed appropriately, and they are best supported. Students appreciated the support of supervisors in guiding them through various situations, including helping them to navigate tricky situations and turning them into 'invaluable learning experiences' (summer student).

Engagement with clients

Previous courses such as Integrated Studio (Reay et al. 2021a) were facilitated by lecturers, who due to timetabling and class size set up, had pre-arranged all engagement with key stakeholders. The internships and summer studentships offered a more intimate experience, requiring greater independence from students to lead engagement with healthcare partners, with the authors

acting in a supervisory/mentoring capacity. Thus students built not only their design skills, but also their communication and collaboration skills by exposing them to different challenges and obstacles. They developed new skills to interact with clients, who often lacked design literacy (Reay et al. 2021b). This included asking questions to gain meaningful feedback in order to progress their designs – a trait they initially lacked experience in. It was helpful for them to see how their ideas were received and perceived by others, and learn how to use responses and feedback gathered from these interactions to inform or adapt their designs. Commitment often differed between clients, and usually needed to be flexible around what was feasible for healthcare staff. We often compensated for this through more mentoring and regular catch ups between supervisors and students to bridge the gap between meetings with the client. This ensured students went to client meetings with confidence and more resolved or progressed concepts. While this wasn't explicitly discussed, supervisors had a good sense of this based on previous interactions and prior established relationships.

Summer studentships offer a more immersive and collaborative experience

The internship (WIL) offered limited access for students to engage with users as projects were limited in scope and focused on short, rapid engagement using existing design skills (Reay et al. 2021a). The projects offered were communication/digital design based due to the WIL paper being limited to students from those disciplines. Student interns were assigned to a project individually or with another student. This meant fewer opportunities for interns to engage with those students working on other projects or those outside of their design discipline.

The summer studentships have been a cohort of 5–6 students each year from various design disciplines. The connections and relationships built as part of these cohorts was a significant benefit, one student reflecting that 'the other [summer students] played an integral role in helping me overcome every hurdle. The amazing support that I received on this journey allowed me to grow both as a designer and as a person.' Although summer students are assigned to one project, being part of a close-knit group meant students contributed to and became informally involved in other projects, which exposed them to variety and widened their perspectives. Furthermore, students from the summer studentship often transitioned into a Masters programme together. Their shared summer studentship experience helped to keep them connected, accountable and supportive of each other. This helped them by enabling them to grow, learn and thrive by challenging and pushing each other as a cohort in their subsequent studies (Kawulich, Ogletree, and Hoff 2016). As mentioned, the longer duration of the summer studentships better positioned students with opportunities to engage with

patients/service users. This richer and deeper immersion into the healthcare context. This was in part due to the flexibility, duration and open structure of the summer studentship, but also due to the organization's investment (funding and time) into the scholarship projects.

Stakeholders' perceptions of success

Students tend to judge the success of a project by the implementation and use of their design (Zitkus et al. 2020). However, students also saw value in the experience itself (Norman 2016). For example, one student shared they wanted to 'use design as a way of helping people, so this project perfectly aligned with my goals as a designer' (WIL intern). For healthcare staff, a successful project was one that is completed and resulted in a useable solution – although they too often acknowledged the value of working with design students and being exposed to different approaches and ways of thinking. For the authors, as facilitators between healthcare staff and students, building long-term relationships with healthcare staff, showcasing the value of design, and creating pathways to future opportunities for students is important.

Reflections on the success of the WIL and summer studentship programmes

Identifying project opportunities – the benefit of being based within a hospital improvement team

The first author (CK), as a key contact based within an innovation and improvement hospital team, has been instrumental in activating project opportunities. Being the only communication designer in the team who has delivered 100+ different projects over three years meant there was established trust in our ability to deliver quality design, with design being made available and easily accessible by word of mouth. Even when an immediate connection wasn't obvious this embedded position enabled the rapid identification of potential project opportunities as well as more open negotiation with healthcare clients with respect to student involvement.

Selection and scope of projects

Projects were carefully selected and identified from existing requests for design assistance through CK's role as described above. For internship projects (case studies 1 and 2), these needed to be of a reasonable scale and scope for learning value but able to be completed within 60 hours (for each student). It was acknowledged that while the output may take longer than an experienced designer, value also lay in the students learning and growth. Projects needed

to be flexible and fit around the students' other courses, and need minimal input from people other than the immediate healthcare client (e.g. no patient or end-user involvement due to the time constraints (Zitkus et al. 2020)). It was also important to find projects with a clear purpose/meaning. This was not only to provide the student(s) with a good experience and for the project to be portfolio-worthy (an important consideration for students preparing for work in traditional design studios (Jaenichen 2017)), but to be able to attract students in the first place. Summer student project selection (case study 3) followed similar criteria, but with a stronger research component to help prepare students for the transition into postgraduate study (Jaenichen 2017).

One of the challenges with selecting projects for interns or summer students was trying to navigate student and healthcare staff's expectations around the scope and scale of projects, in order to give students the space to explore and fully understand the project, and deliver a thorough solution. This was for the benefit of both the student and the service/client. Often, healthcare staff had little idea of what was feasible (Groeneveld et al. 2018). Communication/graphic design-based projects were viewed as being more tangible and it was easier for healthcare staff to connect to their everyday work. Other forms of design were harder to see value in, perhaps because typical solutions from other disciplines (e.g. spatial or product design) are more challenging and require larger investment for implementation.

Proving the value for implementation and use of student work

The projects provided as case studies in this paper were, for the most part, initiated by the health service or client who made a specific request for design assistance. This often resulted in better uptake or implementation of the solution. Unsurprisingly, solutions were more likely to be adopted and implemented when they aligned with what the health service or client expected from the outset (Groeneveld et al. 2018). For example, in case study 3, although the service did implement some of the design outcomes from this project (i.e. the requested patient journey video – Figure 5), there was less enthusiasm towards the full suite of educational resources. Implementation often requires designers to strongly advocate for the value of their work – as was the case here (Cunningham and Reay 2019; Groeneveld et al. 2018). While there was some interest from the service to test the suite of educational resources, a lack of funding has meant this work is yet to progress (also coinciding with the onset of COVID-19). It is not uncommon for design for health projects to not be implemented. The best chance of success requires a well-connected healthcare champion to pursue it within their organization (Cunningham and Reay 2019; Groeneveld et al. 2018; Nakarada-Kordic et al. 2020).

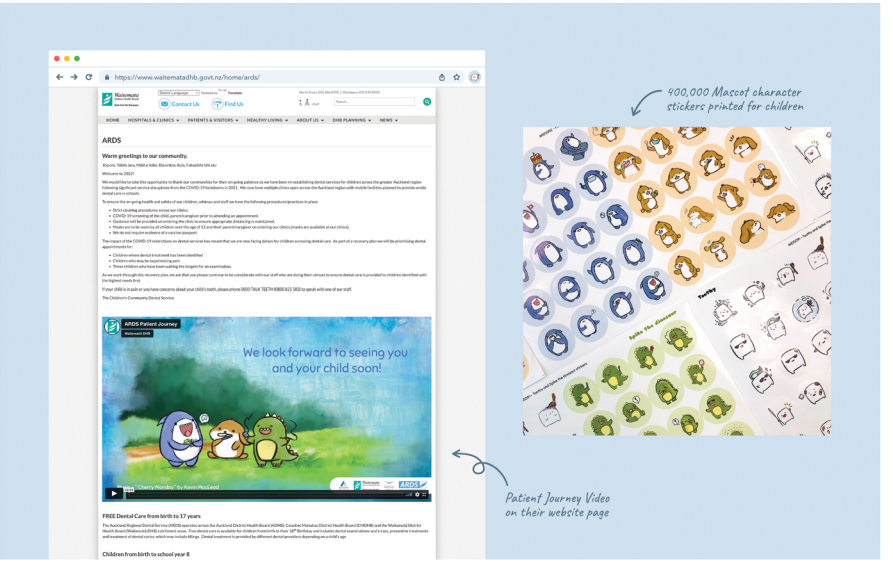

Figure 5. Patient journey video on the children's dental service website (left) and 400,000 mascot character stickers printed to give to children at dental appointments (right).

Despite the need or request for improvement often coming from a service or client, design is often viewed as a nice-to-have, with priority for its implementation often being low for staff (Cunningham and Reay 2019; Nakarada-Kordic et al. 2020). From our experience, it often takes longer than year after the student has finished before solutions are implemented (if implemented at all). Such timelines seem to be common within healthcare projects — this is often the case for projects we have worked on and seems to also be a challenge for other designers working in this space (Chamberlain and Craig 2017; Groeneveld et al. 2018; Kiess 2020; Norman and Stappers 2015). Long delays can be frustrating, especially for students who often expect their work to be used right away – especially when they perceive that the work of their peers (who have interned at fast-paced design studios or commercial organizations) are already being. It has been important to reinforce to students that their work is valued, and to set clear expectations at the start, particularly for more explorative or experimental projects (Groeneveld et al. 2018; Zitkus et al. 2020). In these cases, the value may be in exploring new ideas to showcase different ways of doing and thinking.

Visibility is key for ongoing relationships with healthcare staff and the continuation of projects

The projects chosen for our students were often low-risk, low-priority projects for the healthcare service or client. However, they were often a stepping stone from which to build ongoing relationships with staff around the

value of design. Projects often helped establish further opportunities for collaboration with a particular service (and with colleagues in similar services). These opportunities also opened doors for a wider pool of students through other courses and students outside of the internship and studentship programmes.

An important aspect of visibility of design into the healthcare services has been through student presentations of projects through existing forums (focussing on both the process and the design outcome). This has helped to ensure the engagement of staff who are curious and interested in design, but also those who would not normally engage with these kinds of projects (Reay et al. 2021a). These presentations have increased the visibility and awareness of the value of design for health (Kiernan, White, and Morrissey 2021). Without these presentations showcasing tangible examples of what design and design students can offer it would be difficult to generate ongoing opportunities. Staff enjoy the design presentations in part because they are different, yet relevant, to their everyday work. Student projects are also archived (https://goodhealthdesign.com/undergraduate-students) and shared via social media to further increase the visibility and value of design for health (Kiernan, White, and Morrissey 2021).

Conclusion

Design for health offers a rich and complex context for design students to engage in authentic learning opportunities and actively contribute value and meaningful change for the benefit and wellbeing of others. Understanding context is important when working in these complex and tricky spaces. WIL internships and summer studentship opportunities were offered to expose design students to such contexts, in challenging but safe ways. Through this exposure, students were exposed to the potential for design to be used in ways they had seldom previously considered.

Facilitating real-world opportunities for design students has its challenges. Connections and ongoing relationships with healthcare staff are important to identify and collaborate on real-world projects. Projects must be carefully selected, negotiating scope and scale as appropriate while still being engaging and meaningful. Implementation is highly valued by design students, but take a long time and is usually tricky to navigate within healthcare, due to the bureaucratic, risk-averse nature of the system. Expectations of both students and healthcare staff must be carefully managed to ensure mutually beneficial outcomes. Despite these challenges, design for health offers great opportunities to better prepare design students to be well prepared and ready for the world after graduation. Getting design students involved in healthcare projects also has value for healthcare. Increasing awareness and visibility through collaborations with design students and presentations of

their work helps to challenge healthcare staff to further consider the value of design to help improve their services.

The WIL internships and summer studentship opportunities outlined in this paper were a good starting point used to expose design students to the context of healthcare. Increasing interest from design students to engage in more meaningful and purposeful design (e.g. design for health and wellbeing) suggests undergraduate degrees can offer more courses and opportunities for design students in related areas. In doing so, future generations of designers will be better equipped to deal with and tackle the complex problems of the future.

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Disclosure statement

No potential competing interest was reported by the author(s).

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Cassie Khoo is a communication designer and researcher working at AUT's Good Health Design. Her background is in communication design, specifically in branding and information visualization. Her research focus is in design for health, with a particular interest in the use of co-design to improve communication of information in healthcare.

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