'The inclusive way' hackathon: inclusive wayfinding and pedagogy

Hackathon de maneira inclusiva:
orientação e pedagogia inclusiva

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hackathons, inclusive design, pedagogy, wayfinding

This paper discusses the opportunities and challenges for learning about and building skills for inclusive practice through a two-day, multidisciplinary, collaborative hackathon. 'The inclusive way' brought together students and staff from different disciplines and study levels, people with disabilities and industry professionals. Working on-site, project teams explored an inclusive wayfinding brief, developing and appraising prototypes for inclusive practice in response to the physical site and its immediate surroundings. This presentation reflects on the hackathon as a pedagogic approach, highlighting its potential and limitations for communication and information design education in the 21st century.

hackathon, design inclusivo, pedagogia, orientação

Este artigo discute oportunidades e desafios na aprendizagem e no desenvolvimento de competências para práticas inclusivas por meio de um hackathon colaborativo, multidisciplinar de dois dias. 'A forma inclusiva' reuniu estudantes e profissionais de diferentes disciplinas e níveis de ensino, pessoas com deficiência e profissionais da indústria. As equipas do projeto exploraram a trabalhar no local um briefing inclusivo de orientação, desenvolvendo e avaliando protótipos para práticas inclusivas em resposta ao local físico e o seu ambiente imediato. Esta apresentação reflete sobre o hackathon como abordagem pedagógica, destacando o seu potencial e limitações para a educação em comunicação e design de informação no século XXI.

1 Introduction

Hackathons are not new to design practice or education. Their role in design research is also growing (Flus & Hurst, 2021). Examples of hackathons in engineering, product, software, systems and user experience design are well documented (e.g., Flus & Hurst, 2021). They are similarly widely used in information design as demonstrated by The Simplification Centre's (n.d.) series of Simple Actions, wayfinding initiatives (e.g., Connecting Cambridgeshire, 2017; Devpost, 2015) and various examples of data visualisation hackathons. Hackathons are

also established activities in research units that focus on inclusive design (e.g., the Helen Hamlyn Centre for Design and the Inclusive Design Research Centre).

The pedagogic opportunities and challenges for hackathons are often discussed within papers that either focus on evaluating the use of hackathons across a discipline or presenting a specific disciplinary case study (e.g., Scott et al., 2018 focus on architecture). In contrast, 'the inclusive way' case study presented here, is a multidisciplinary initiative bringing together students from a range of programmes. Given the importance of collaboration and transformation in design education (Wilde, 2020), alongside current global educational challenges, the paper reflects on the ways in which this kind of event might embed key skills for design education in the 21st century. In particular, it considers the implications for communication and information design.

2 Contextual foundations

Design education needs to evolve new ways to contribute to social transformation in the 21st century (Wilde, 2020). At the same time, design education is also under pressure to respond to a number of challenges in higher education. Cezzar (2020) highlights that these mainly arise in response to globalisation, digitisation and marketisation. In many communication design programmes across the world, cohort sizes are increasing and the diversity of individuals within these cohorts is shifting. Cultural diversity within cohorts presents new opportunities and responsibilities for communication design education to evolve and develop more global cultural relevance. However, it also means that there is significant variety within a cohort's frames of reference and their career aspirations, as Cezzar (2020) notes. Combined with less homogeneity in prior learning and expectations for particular modes of learning, communication design educators need to respond innovatively to these uneven foundations and provide learning opportunities that develop skills for the breadth of careers that are evolving. Cezzar (2020, p. 219) advocates that, rather than trying to even out the foundations and work towards a common "finish line", design educators need to embrace the reality of this diversity.

Within higher education, there is currently much discussion about the importance of embedding transferable skills, equipping graduates to respond to social challenges and addressing issues of equality, diversity and inclusion in curricula and pedagogy. These themes are mirrored in design education. For example, Wilde (2020, p. 171) states that design has a critical role to play in social transformation. Similarly, Cezzar (2020, p. 225) argues that communication design has "an opportunity to build a more conceptual, integrative, and inclusive discipline" that can contribute to "better humans, not just better designers".

However, this perspective can be particularly challenging for students who may be used to seeing creative practice as subjective expression and

an intuitive, aesthetic response rather than as a complex, problem-solving activity. Graphic communication's reputation as a less robust discipline than other design disciplines and commonly held public perceptions about what communication design entails and why students might elect to study it, does mean that these outdated views of communication design are nevertheless persistent (Corazzo et al., 2014). In this respect, it can be challenging to get students to engage with the depth and complexity of a brief to move beyond superficial and subjective responses. As Weil and Mayfield (2020, p. 161) elucidate: "This simplistic approach is increasingly problematic in our field, as the issues design addresses today go far beyond one person's experience and instincts."

This paper describes and reflects on 'the inclusive way' with a view to considering how it might demonstrate constructive ways to respond to these disciplinary and social challenges and opportunities.

3 Approach

3.1 Breaking down Barriers (BdB)

'The inclusive way' was planned in 2019–20 as an initiative within the Breaking down Barriers (BdB) project. BdB is a multidisciplinary teaching and learning initiative that began at the University of Reading (UK) in 2015. The project set out to champion embedding inclusive design in curricula across the university. The project team has grown over the years and represents a range of schools and disciplines including team members from Architecture, Arts & Communication Design, Biomedical Engineering, Built Environment, Modern Languages, and Real Estate and Planning. BdB activities have included student-facing initiatives, helping colleagues in other schools embed inclusive design within their programmes through collaboration and training, and dissemination activities beyond the home institution.

Before 'the inclusive way' hackathon, BdB initiatives often shared staff expertise and inclusive design learning activities across programmes. However, the team wanted to provide opportunities for collaboration between students on different programmes. Plans for cross-programme field trips to industry partners in previous years had been disrupted by external factors. Thus, 'the inclusive way' hackathon in February 2020 was the first BdB cross-school collaboration that involved students from different schools and levels of study working together on the same brief.

BdB initiatives often embedded opportunities for students to learn from people with disabilities and inspired many students to conduct research with people with disabilities for dissertations and final projects. However, the hackathon was the first group-learning project activity that adopted a co-design approach. In this respect, our team drew inspiration from the Helen Hamlyn Centre for Design's Inclusive Design Challenges.

Typically, hackathons are discussed in terms of three phases: pre-hackathon, hackathon and post-hackathon (e.g., Page et al., 2016). This paper presents an overview of the event using these three phases and then extends the discussion to reflect on the wider pedagogic implications arising from the project.

3.2 Pre-hackathon

The hackathon was awarded internal funding from the University of Reading's Diversity and Inclusion Initiatives Fund and carried out following ethical review and favourable opinion in accordance with the procedures of the University Research Ethics Committee.

The primary aim of the hackathon was to provide opportunities for co-design and experiential learning as key pathways to developing empathy and knowledge for inclusive practice in wayfinding. The secondary aims were to involve students from a range of disciplines and programmes and to give them opportunities to engage with industry partners.

Undertaken as a pilot for future multidisciplinary teaching and learning endeavours, the hackathon was primarily an extra-curricular activity. However, some students were able to draw on this experience to develop and submit extended outcomes for assessed modules.

Students from all disciplines and years of study were invited to take part. Accordingly, the event was scheduled for the spring semester 'reading week' to ensure timetabling restrictions did not prohibit some students from taking part. We acknowledge that students who need to use this time for paid work may be less likely to take part in extra-curricular projects and thus this timing is not fully inclusive. However, as a pilot activity to explore how we might embed cross-programme collaboration within curricula, we accepted this limitation but would seek to redress this for long-term implementation.

3.3 Hackathon

'The inclusive way' brought together students and staff from different disciplines and study levels, people with disabilities and industry professionals. Working on-site, project teams explored an inclusive wayfinding brief, developing and appraising prototypes for inclusive practice.

'The inclusive way' was a two-day hackathon. Fifteen students took part, including undergraduates and postgraduates from programmes within Architecture, Biomedical Engineering, Construction Management, Graphic Communication, Information Design, Modern Languages, and Real Estate and Planning. Their familiarity with inclusive design principles and practice was varied in relation to their disciplinary focus, level of study and individual connections or experience.

Students worked with five design partners from our alumni community and staff disability network who have physical and/or cognitive disabilities and were willing to share their lived experience. Design partners shared their experience of wayfinding with conditions such as ADHD, dyslexia and dyspraxia, Becker muscular dystrophy, blindness, among other kinds of disabilities.

Opportunities to engage with industry partners were also embedded. Zoe Partington from DisOrdinary Architecture joined us remotely at the outset of Day 1. Information design and wayfinding experts joined us on Day 2, including George Sidaoui and Ellie Baker (both from Applied Wayfinding) and Rachel Warner (Rachel Warner Design).

The hackathon was a site-specific activity using the University's London Road campus and its immediate public realm surroundings and transport links to consider problem-solving for lived experience and diverse user needs. This small site is used for a range of events that include both the University community and members of the public. Students were allocated to multidisciplinary teams with different design partners. Across the activities of the two days, each team was encouraged to collaboratively identify what aspects of the site and its links to the immediate urban environment might present challenges for inclusive access and propose and evaluate potential solutions to these challenges. Students worked with the design partners to co-design solutions, while also having opportunities to learn from the design partners' first-hand experience of living with different kinds of disabilities.

To enable teams to build familiarity with the campus and its surrounds, the first day commenced with an accessibility treasure hunt. Essentially an auditing activity, the treasure hunt provided opportunities for teams to appraise the site in relation to both lived experience and regulations for inclusive environments. The team findings were then shared among the wider group in a debriefing discussion. This was then followed by an online presentation from industry partner, Zoe Partington (DisOrdinary Architecture) and perspectives on living with disabilities from the design partners. This extended the discussion to build links to lived experience, industry initiatives, principles and gaps and explore these from a range of perspectives.

Thereafter, teams were introduced to the main wayfinding brief for the hackathon. The brief included an event scenario so that the project teams could explore ways in which inclusive design initiatives might improve accessibility and wayfinding on the site. They were encouraged to consider physical, cognitive and cultural accessibility for people with different levels of familiarity with the site, identifying and appraising both challenges and solutions in relation to a range of user needs. In particular, teams were encouraged to consider values, challenges and tools in their design approach (Figure 1). Time was dedicated for in-depth discussion, exploration and evaluation of initial ideas, which were pitched for feedback at the end of the day. Day 2 focused on the prototyping of ideas, with specific engagement on accessibility, materials and texture (Figure 2).
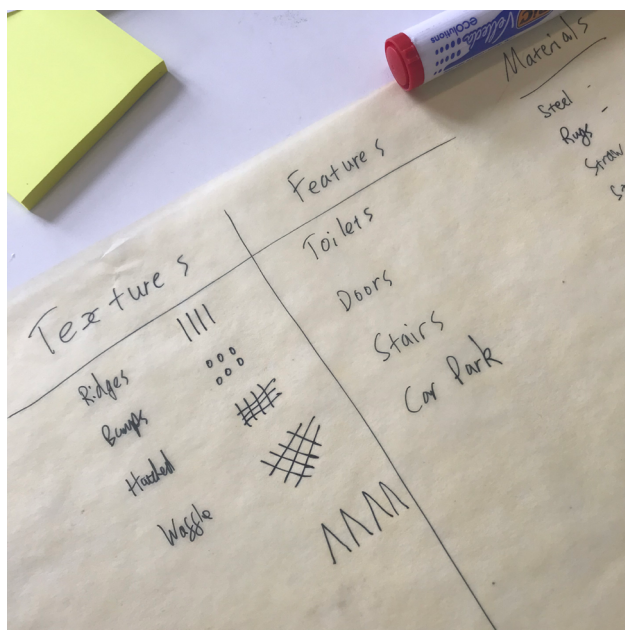
Figure 1 Ideation.

Figure 2 An example showing a team's focus on texture.

Participants were able to incorporate a range of design tools into this process. In particular, a user-scenario design cube (created in collaboration with Avanti Avanti and the Universal Design Foundation and brought to the workshop by our guests from Applied Wayfinding) was helpful to appraise ideas and prototypes across a range of scenarios and consider different combinations of user needs and priorities. As a student participant reflected in a blog: "they showed us that it was not necessarily just a case of designing for a particular disability such as a partially sighted person, but that a person could also have mental health issues or other particular circumstances, temporary or long-term, which may need to be considered" (Slater, 2020).

Throughout the process, opportunities to discuss and share walk-throughs, ideas and prototypes were included. At the end of the event, the design solutions were presented and reflections shared. Participants were also asked to complete an evaluation survey with a rating scale and open questions.
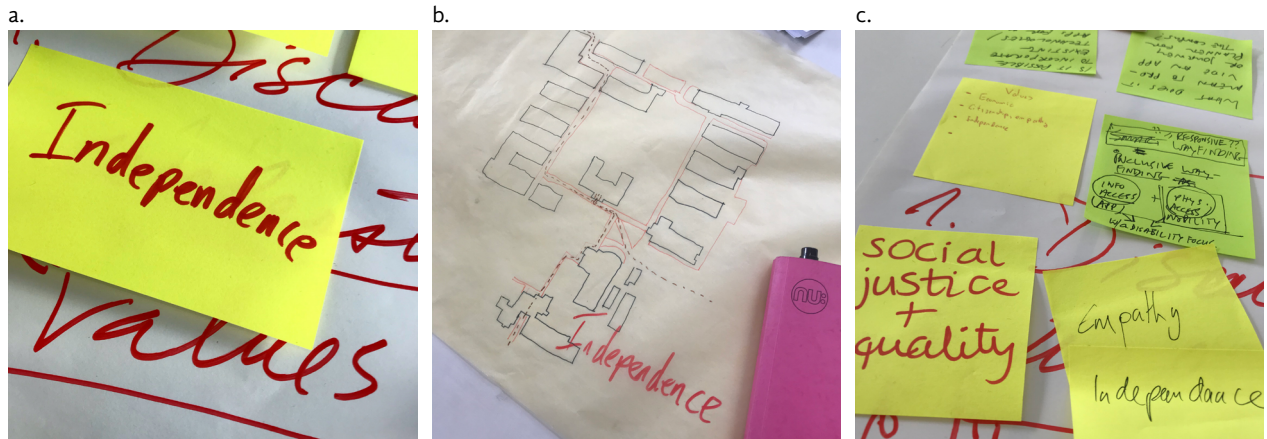
a. b. c.

Figure 3 (a–c): Independence emerged as an important priority in inclusive design.

A key theme that emerged on the first day was the importance of designing to enable independence and the teams' design solutions aimed to address this priority. Proposed solutions encompassed digital solutions to support decision-making before and during a visit to the campus and physical solutions that included auditory and tactile cues for the built environment. Within these proposed systems, teams considered both conventional wayfinding aids (e.g., apps, icons, maps, tactile paving) and unconventional aids (e.g., windchimes). Prototypes were presented through sketches, digital and physical mock-ups using a range of materials, as shown in Figure 4.

3.4 Post-hackathon

The BdB team met after the hackathon to review the feedback and discuss forward planning.

The evaluations indicated that participants valued this learning opportunity. All star rating scale responses to the question "Overall, how would you rate the hackathon?" indicated either 4 (20%) or 5 (80%) stars. The written responses to questions about what they enjoyed or found most interesting and what they learned or gained from participating indicated that the primary aims were achieved. As the responses in Table 1 show, participants consistently valued learning first hand from design partners and working collaboratively across disciplines.
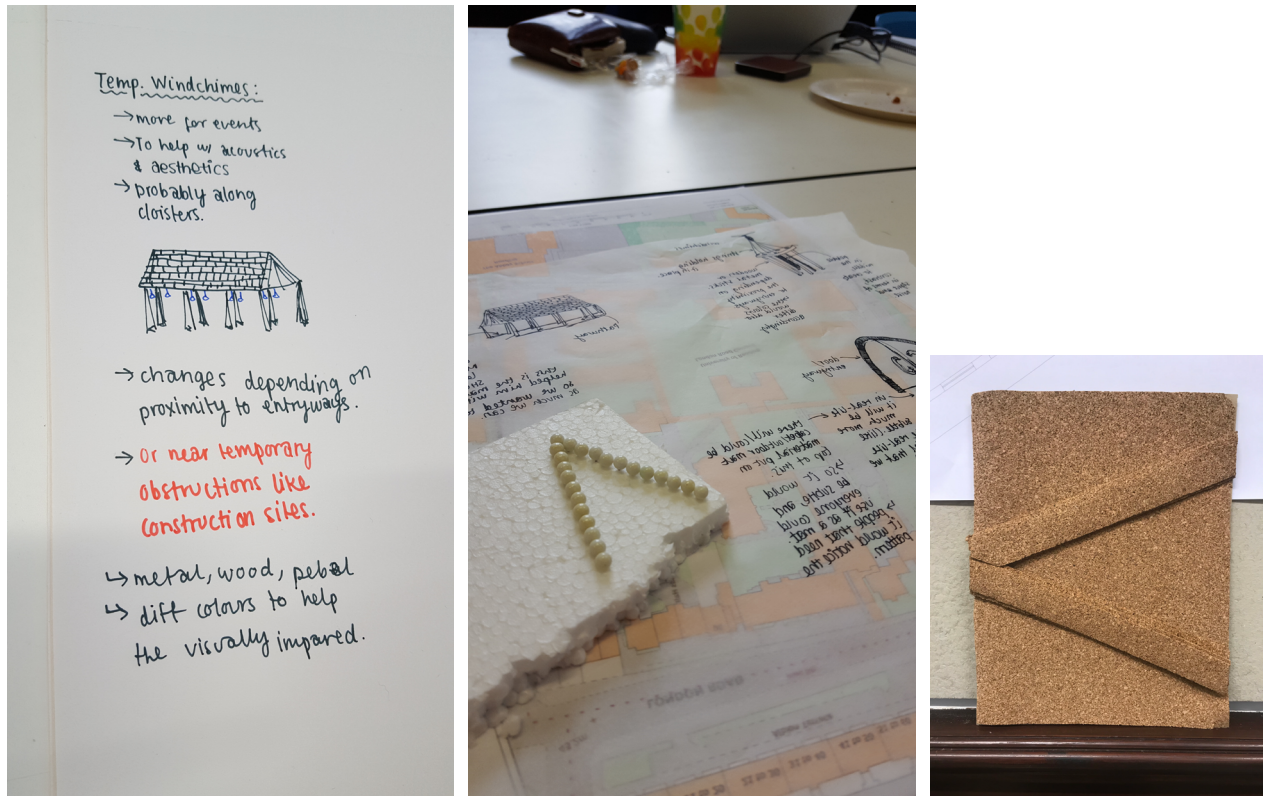
Figure 4 Examples of design prototypes created on Day 2.

Table 1 Participant responses.

What did you find most interesting or enjoyable about the event?	What are the most useful things you have learned or gained from participating in this event?
The involvement of the design partners	The difficulty of working in this area from a consideration of different needs to the way we question/debate universal design solutions – equality versus equity
The diversity of the participants and guests	The opinions and experiences of the user has shaped my own attitude to inclusivity
student engagement in the project peer feedback diverse contribution from different department	Live experience in real context of wayfinding for people with different disabilities
1 the fact that the hackathon was on the subject of inclusivity and not data 2 the fact that it was not only tackling the theme of inclusivity through projects but also by involving an inclusive group of people (partners specifically)	Inclusive design is not an add-on inclusivity it is part of our everyday fabric we should respond to it
Great that cross disciplinary collaboration is encouraged and valued this reflects professional practice & is a vital skill	Nothing can replace the understanding slash insight of left experience & understanding this through the hackathon promotes respect & inclusive thinking
Finding out different views and learning new things And being able to practically make things it wasn't all lectures we got to design & make.	Finding out different viewpoints and working with people in different disciplines as well as people in a professional workspace

Table 1 Participant responses.   (conclusion)

What did you find most interesting or enjoyable about the event?	What are the most useful things you have learned or gained from participating in this event?
Interacting with people who live(d) with disabilities and understand their lived experience I enjoyed the group work with other students and the input from university staff	I gained a more thorough understanding of different approaches to working with disability
Interaction with professionals and disabled people for their opinions	Knowledge of how to design for blind / visually impaired people
Talking to the people most affected by these issues raised and getting first hand experience of problems in architecture as well as how people work around them	Changing the way in which I design normally it feels like another parameter for design but it was really helpful to get a shocking reminder that actually people are fundamentally affected by design and architecture can be helpful in remedying that
Learn something about the design for disable(d) people	To communicate with the disable(d) people to know their lifestyle
Finding more about the many disabilities and impairments that are affected by the environment	The ability to find the main problems that affect disabilities when wayfinding
Meeting with the design partners and understanding their view on life	Inclusivity (in cooperating) Delegation Awareness Working with different disciplines Leadership
Experience shared by disabled people knowledge about disabled people / design for disabled	Accessible issues could be for everyone Don't make imagination before asking question; experiencing where they experience doing test
I enjoyed meeting —, —, — and — and finding out about how they live their lives with a disability	The most useful part was when our group was able to sit down with — and freely ask him questions about life being visually impaired this gave us a huge insight into what product to develop
Working with design partners to gain new perspective speaking to people who are passionate about inclusive design working with people with different backgrounds and experience levels	Learning about the different resource is available was very useful

In terms of what participants liked least, their feedback can be grouped into four areas:

- 8 participants either did not note anything they did not enjoy or stated explicitly that they had nothing they did not value;
- 3 participants commented on the brief – one suggesting that it was too vague and that a clearer outcome could be given, another suggested that more direction on the first day would be helpful and a third said that it would be good to extend the activity beyond the London Road campus;
- 3 participants commented on the audit activity, one suggesting that the debrief of the activity was less helpful and they would prefer to debrief a case study, one simply noting it as less enjoyable and one suggesting that it could be shortened;

▪ 1 participant noted that the hybrid session with an online speaker was less effective than the in-person activities.

Suggestions for improvement primarily included ways in which to extend the engagement with design partners. For example, students suggested: more design partners representing a greater range of disabilities, more time spent with different design partners (as groups tended to work closely with one partner), more involvement of design partners in the final presentations or testing of prototypes (not all design partners were able to stay for the whole event).

Students also suggested ways of scaling up the event to include more participants, make it longer or work with a live brief that could be implemented. One participant suggested more access to materials and another recommended more case studies and examples of good practice needs to be shared.

The BdB team reflections highlighted the value of learning about colleagues' different disciplinary approaches and facilities. For example, we found it valuable to learn more about audits and regulations and how these can inform how we teach students about inclusive design and how different workspaces have a particular atmosphere and may lend themselves to specific kinds of learning. The architecture studio, for example, lends itself to an emphasis on tangible making. It was also reassuring that our design partners and industry partners shared perspectives and advice that validated what we are aiming to teach our students.

We observed how students from different programmes approached the brief, their idea generation, the sorts of tools they were inclined to use to support their design process and present ideas, and the way they described and evaluated their outcomes. Building on this observation, we would like to consider for future multidisciplinary learning activities how we might encourage students to (1) reflect at the outset what their habitual approaches might be and (2) consciously explore opportunities for evolving their own working processes. This could be particularly important for learning activities with more participants where differences in individual confidence may influence the approaches taken and the range of learning that might occur. Given Cezzar's (2020) call to embrace the reality of diversity within design cohorts, and the need for design graduates to have competencies for working in teams and across different sectors, this kind of multidisciplinary learning experience could be very valuable.

Overall, the hackathon achieved our initial goals and provided useful feedback that can be used for future events. Unfortunately, immediate plans for a second hackathon were disrupted by the Covid pandemic.

We also began to explore possibilities for a multidisciplinary module in inclusive design. We were mindful that the hackathon was resource-intensive for a very small number of students and we were keen to develop the scalability of this event. As an interdisciplinary pilot it was feasible to host the hackathon as an extra-curricular activity during a

week when standard timetables were suspended. In the long run, it would be better to embed these kinds of activities into the curricula so that more students can take part. Extracurricular activities can be difficult for students who are struggling with their coursework or undertaking part-time work to pay their bills to attend, and so it would be advisable to consider alternative scheduling options to make the event more inclusive. Nevertheless, it was very rewarding to observe the enthusiasm with which students engaged with their team members from other disciples, and with the design partners – evidence that students can and will engage in this kind of learning and do it as a 'voluntary' activity.

When planning future events, we would also endeavour to carry out some pre- and post- activity data collection to assess learning gain (which we typically do for BdB learning activities embedded within modules) and reflect strategically on our roles and the extent to which we might be observers, facilitators or participants within a learning hackathon.

4 Pedagogic implications

Hackathons are already recognised as good for building students' experience of collaboration and gaining experiential learning. The participants' positive responses to working in multidisciplinary teams indicates that this might have significant benefits for building foundations for inclusive learning in diverse cohorts (both within and across programmes). The multidisciplinary approach has the potential to build more realistic experiences of group work and collaborative problem-solving. It may also enable students to recognise their disciplinary competencies and prior learning more readily than working in teams with their programme peers. It would be beneficial to explore this possibility further, given the importance of collaboration as a skill and the well-known challenges of group work within higher education.

The feedback from 'the inclusive way' participants consistently indicated that participants valued the opportunities to co-design with design partners and gain first hand insight into the lived experience of people with disabilities, work in multidisciplinary teams and, gain feedback from industry experts and tutors from different disciplines. The diversity of participants was appreciated and made the learning experience seem more "real".

A challenge within design education is the need to help students develop skills and personal attributes for creative thinking and working with uncertainty. It is not uncommon for students to want more direction, and design educators to leave outcomes undefined to encourage creative responses (Giloi & Du Toit, 2013). Participant feedback indicating that they might find more direction helpful could be addressed through their other suggestions about sharing more examples of good practice.

Hackathons are reputed to be good for rapid ideation (Flus & Hurst, 2021). With the increasing diversity of graduate careers and the rapidly evolving technological change in industry, it is increasingly important to

provide project briefs that enable independent interpretation and scope for students to align projects to their specific interests. However, in parallel, the "boundless" (Suominen, et al., 2018) brief can be problematic. Without sufficient parameters, students' learning may lack focus and depth. In this respect, hackathons can work well to provide a sufficiently concrete learning experience with clear parameters while retaining the scope for independent interpretation and creative problem-solving.

'The inclusive way' also worked well because project teams were given a site-specific brief to enable them to engage deeply with the context of use and had opportunities for discussion with end users to understand user needs and experience. The teams worked on problem identification and prototyping solutions but with sufficiently tangible parameters to work within. The brief enabled groups to collectively build skills that map to the three key competencies that Weil and Mayfield (2020, p. 159) identify for design: "embracing complexity", "cultivating possibilities", and "driving impactful change".

In addition, working collaboratively and engaging both with users and the environment ensured that project teams were able to engage with "the problem space" (Weil and Mayfield. 2020, p. 161) in meaningful ways. This suggests that this kind of approach might be useful for deepening learning and engagement with the complexity of real-world problems. We had anticipated that engaging with the design partners would support pathways to empathy and the participant feedback suggests that this was the case. There is scope however, for future initiatives, to evaluate more explicitly how the site-specific hackathon as a pedagogic tool might develop competencies for engaging with complexity. There is also potential to consider the benefits of site-specific learning, particularly for learners who will have experienced significant periods of purely online learning during the pandemic. Might the site-specific hackathon be useful for developing new learning behaviours and problem-solving skills for a new generation of learners?

Despite these benefits, the hackathon is potentially a time- and resource-intensive pedagogic tool. And for site-specific learning, there are space considerations too. In higher education, there are already pressures on time and space which impact how learning happens. However, our findings suggest that rather than dismiss the hackathon as too resource intensive, it is important to see this as an important pedagogic tool that can enable deep and meaningful learning. If educators work collaboratively and industry partners invest time in these kinds of learning opportunities, there is significant potential for building new foundations for design education that prioritise experiential learning and engagement with complex problems. This foundation would importantly recognise both the diversity of learners and the diversity of human experience we are designing for.

What was particularly useful about combining co-design with design partners who live with disabilities and a site-specific project was the shift in emphasis from *what* teams are designing to *how* it is experienced. This is a desirable shift. Students often seem to be preoccupied with what

they are going to design and how it looks, rather than how it will be used. They may acknowledge the importance of user-centred design and express a desire for their desire to effect social change but often may not explore these beyond a superficial level. We observe that this approach might help scaffold ways in which students in our disciplines might build necessary skills for dealing with complexity in user-centred design for social change.

5 Conclusion

This paper advocates for educators and industry partners to work together to provide more opportunities for experiential learning. The higher education sector faces significant challenges in relation to the marketisation of education, changes in education policy and funding. Design educators are committed in principle to evolving practice but often change is significantly hampered by time, resourcing and other pressures. There are many ways in which our practices need to evolve to address issues of social justice for new generations of designers whose learning styles are substantially different and rapidly evolving.

Acknowledgment

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