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Engaging with Challenges in Design Education
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Learning Remotely Through Diversity and Social Awareness

The Grand Challenge Approach to Tackle Social Issues Through Diversity and Creative Thinking

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Covid-19 has brought unprecedented and unthinkable transformations that have drawn uncertainty across the world, in particular regarding the strategies that could most effectively help the global population undertake substantial behavioural changes. To reflect and generate a response to the societal flaws in safety procedures the pandemic has exposed politics, communications, logistics, and global economies, the Royal College of Art School of Design launched a Grand Challenge on Design for Safety which enquired the design capacity to draw behavioural propositions that leverage diversity, creativity and, generally, attitudes for addressing societal challenges proactively. This was explored by engaging a community of multidisciplinary and multicultural postgraduate designers, working remotely away from the studios, to think beyond solutions and imagine unthinkable ways to innovate. This diverse community of designers and thinkers became an asset for developing design strategies that, mirroring the initial hypothesis, generate knowledge for design to learn from the dramatic changes the world has experienced through the pandemic to inform more sustainable and equitable futures.

Keywords: design for behaviour; remote working; collaboration; interdisciplinarity

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1.0 Introduction

Figure 1. Grand Challenge of Design for Safety outline. Inspired by Laura Spinney's book "Pale Rider. The Spanish Flu of 1918 and How it Changed the World" the research engaged a community of 388 postgraduate designers of different disciplines and cultures in thinking of design solutions beyond the pandemic. This community working remotely across the globe was an asset for the research for the experimentation of different models of research and training developed upon the exchange of knowledge between experts and young designers to tackle complex societal issues. The diagram introduces a colour code system which helps the navigation of the different methods and tools implemented across the research (see more in section 3.0).

2.0 Grand Challenge

2.1 Grand Challenge Brief

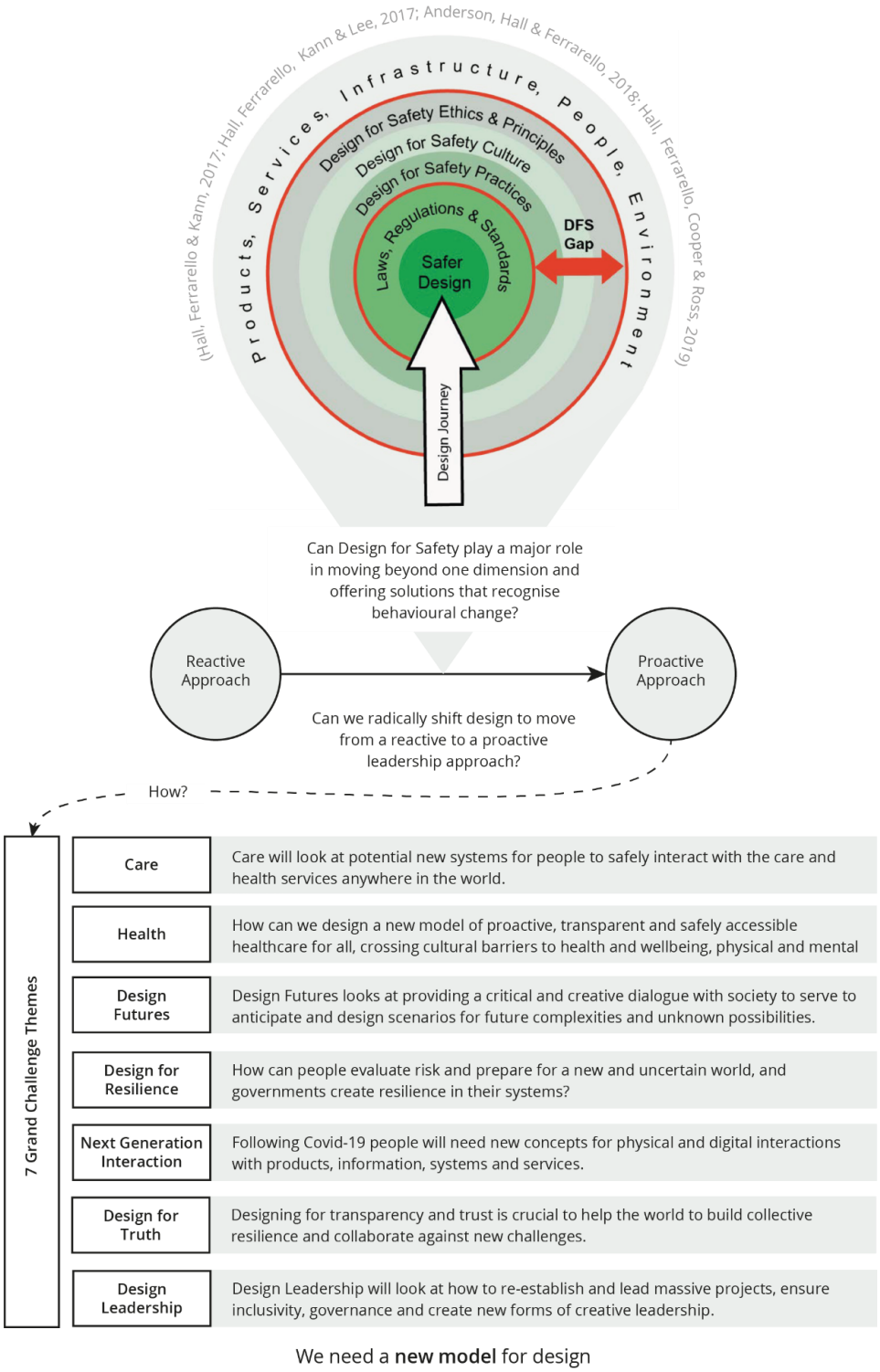

Figure 2. Grand Challenge Briefing. To reach the objective of developing a new model for design able to address, and include, the complexity of social challenges, the Grand Challenge (GC) engaged with seven themes - Care, Health, Design Future, Design for Truth, Design for Leadership, Design for Resilience and Next Generation of Interactions. The research project builds from previous work conducted by the authors, which explored what role design can play in mitigating risks for improving safety.

2.2 Student Locations

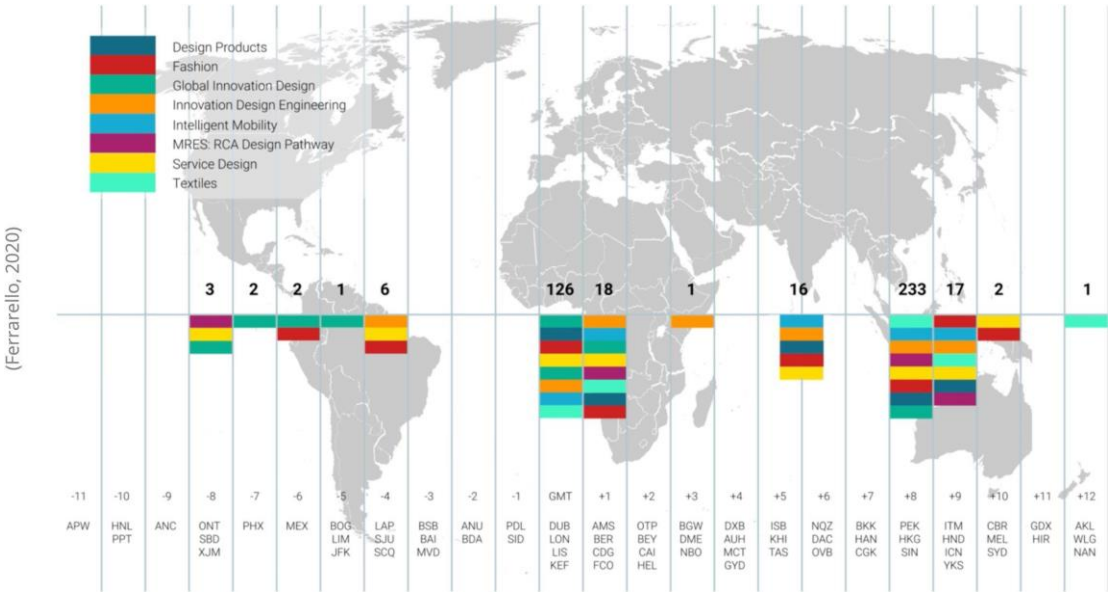

Figure 3. Student Locations and Programme Distribution. This infographic depicts the students' distribution. The Grand Challenge had students participating from 7 different programmes, located in 21 countries and collaborating across 13 different time zones. It is estimated that over the four-week period, teams devoted 64,000 hours to the grand challenge.

2.3 Student Location Diversity

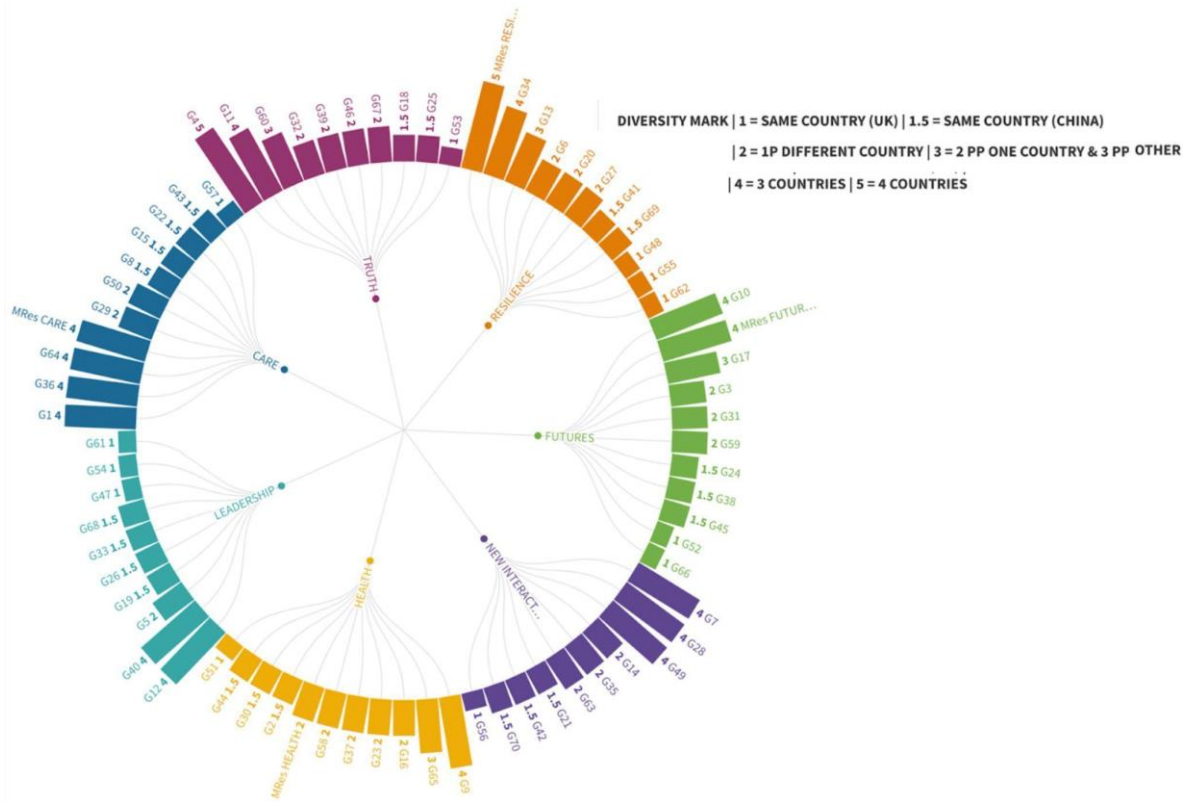

Figure 4. Student Location Diversity. To ensure sustainable and collaborative teamwork, groups were composed of designers within similar time zones. The diagram is a representation of the distribution of student groups across different locations. Unfortunately, this data did not allow us to fully comprehend the influence of diversity on students' design approaches due to students being located in countries other than their national countries.

2.4 Grand Challenge Timeline

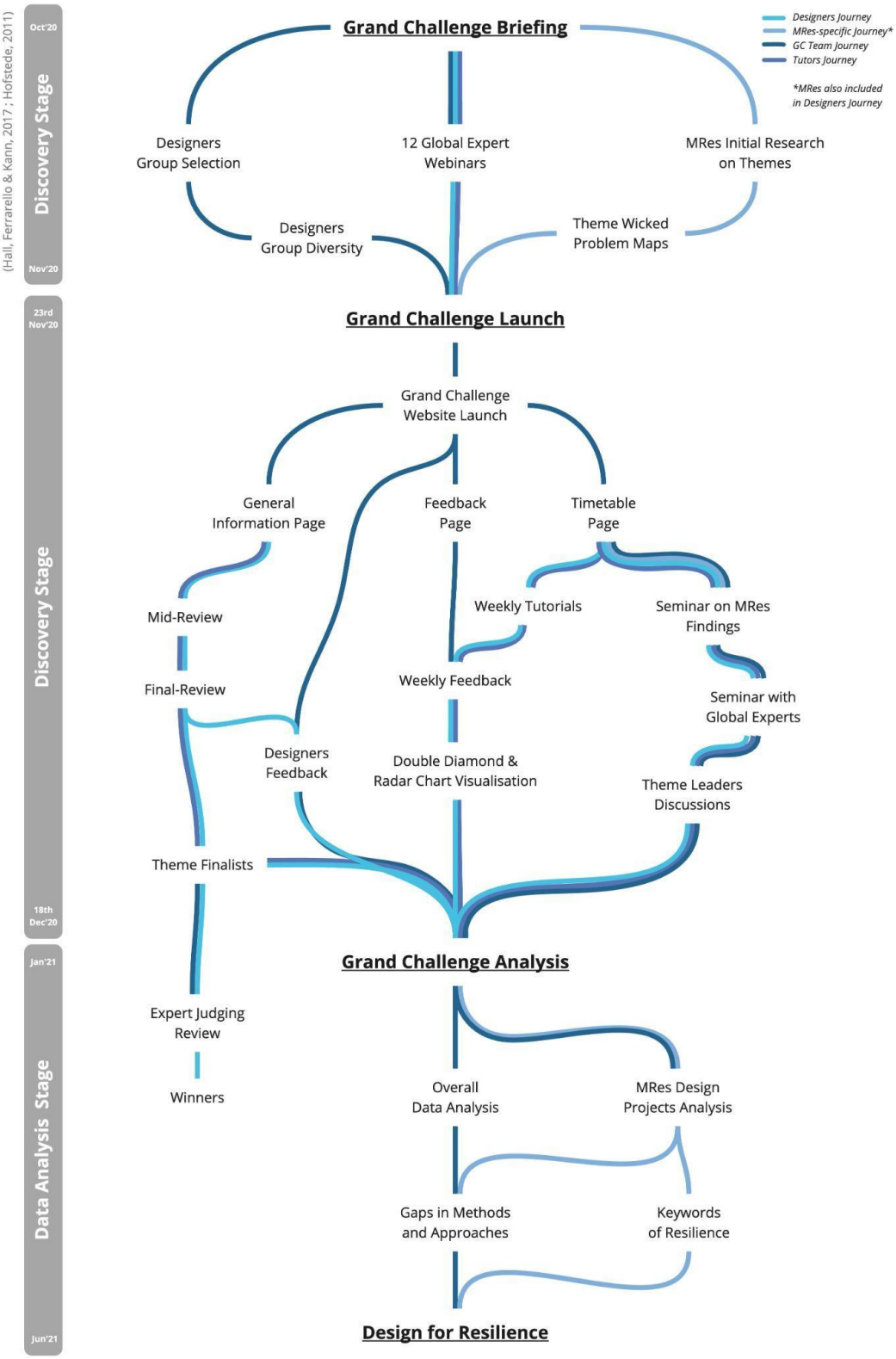

Figure 5. Grand Challenge Timeline. The project was developed over a period of three months. In the first phase, we launched a series of panel discussions through which the students could discuss with global experts across sectors about the challenges related to the seven themes. During this phase, a group of students from the MRes in Design developed a literature review that helped identify key issues per theme. In the second phase, the groups had to translate any concept and insight into design proposals; and in the last phase, the research team analysed the data.

3.0 Methodology

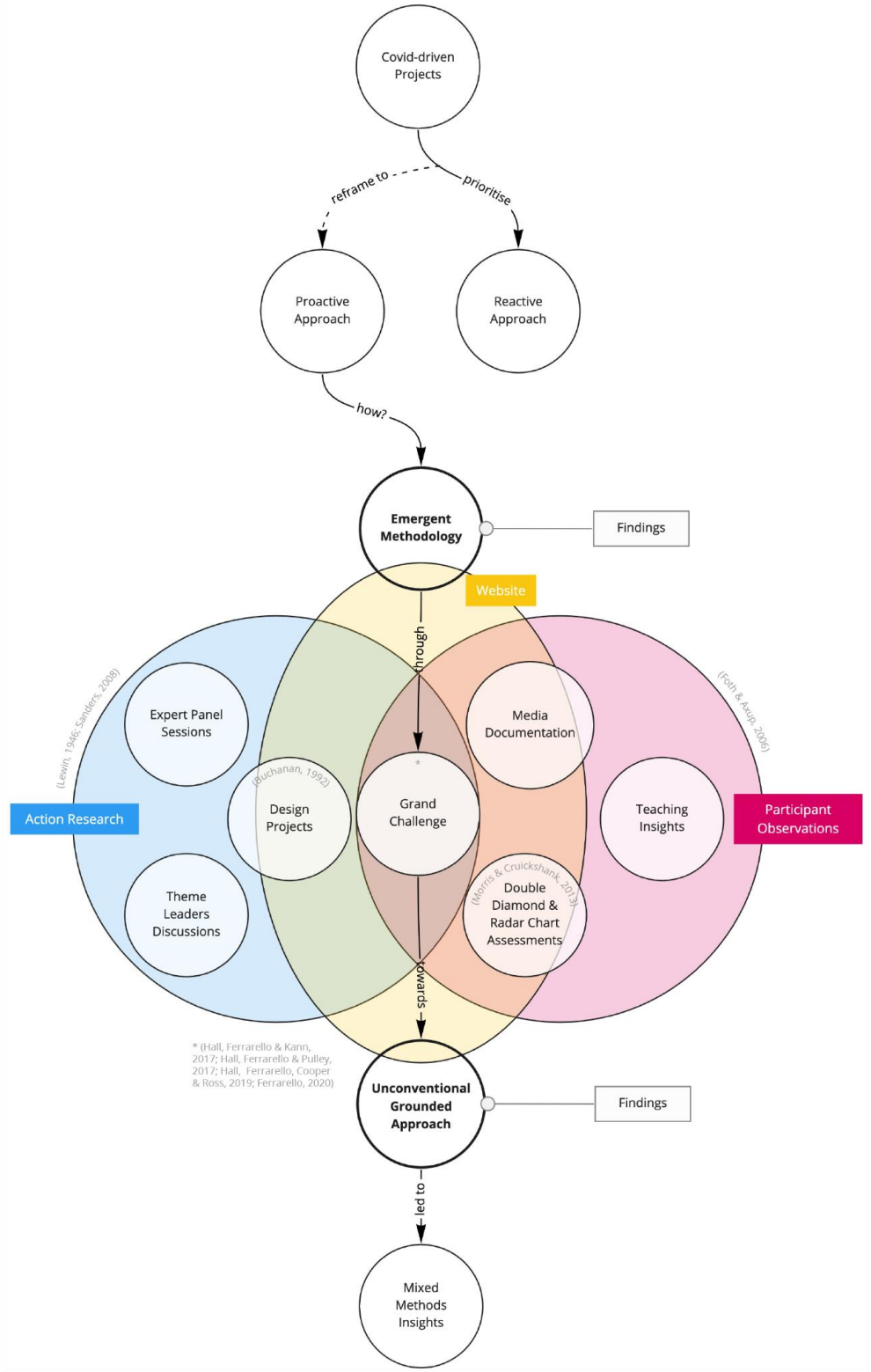

Figure 6. Methodology. The research's motivation started from recognising the need to reframe the way designers have operated during the covid-19 pandemic, from reactive to proactive. To respond to this, we undertook research primarily driven by action and participant observation to explore an unconventional grounded approach where we were able to start codifying clusters of insights from qualitative (double diamond process group analysis) and quantitative (design projects, teaching insights, expert panel sessions and a panel where researcher theme leaders discussed their combined conclusion) mixed methods insights.

3.1 Designing the Website

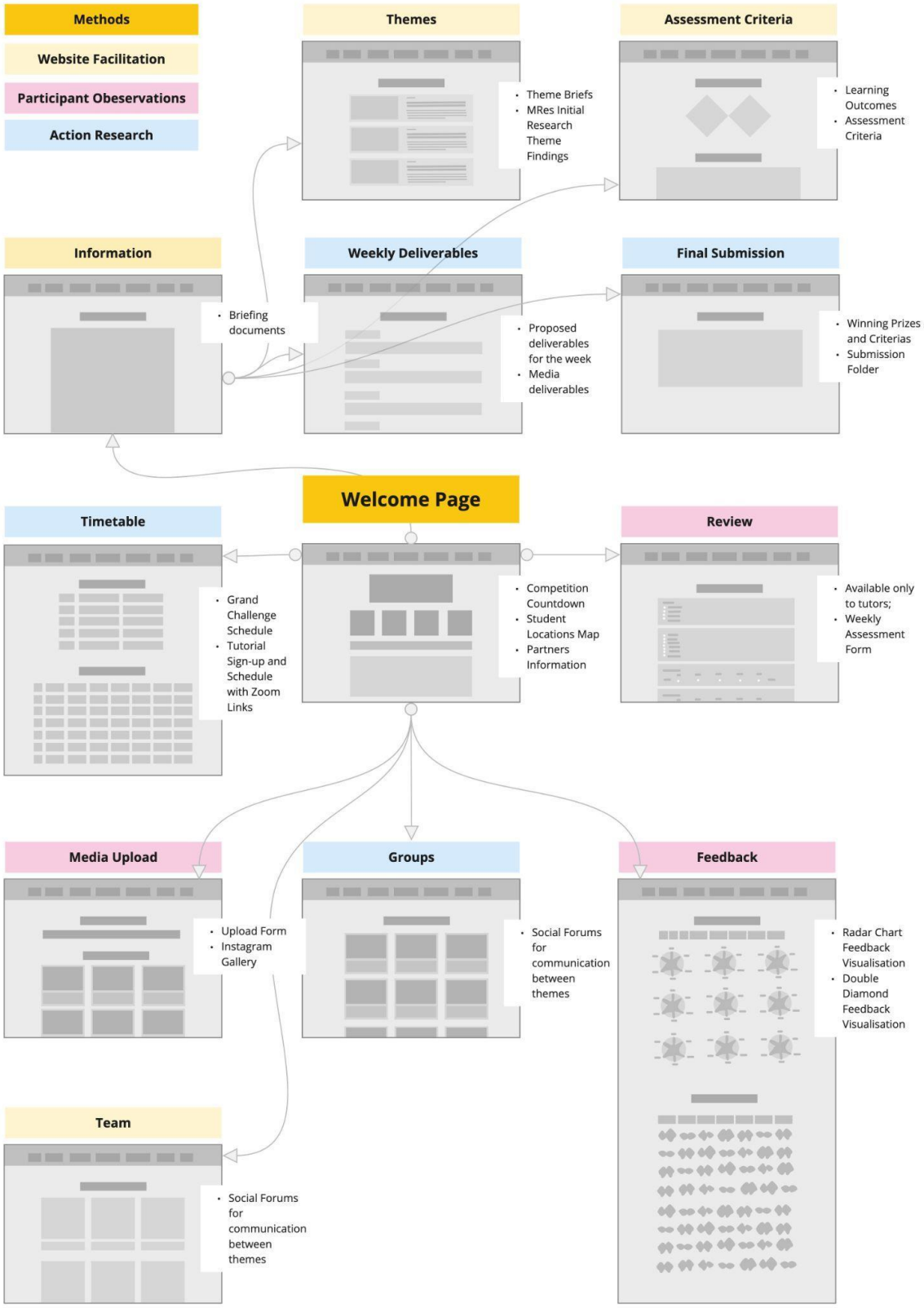

Figure 7. Grand Challenge Website Architecture. As the GC took place during the 2020 pandemic, where students were working remotely around the world, regular communication and engagement would be key to the success of the research. As such, a website, designed through Wix, was developed as the central operating system of the GC where information was shared, feedback was displayed, and tutorials were booked.

3.2 Assessment Process

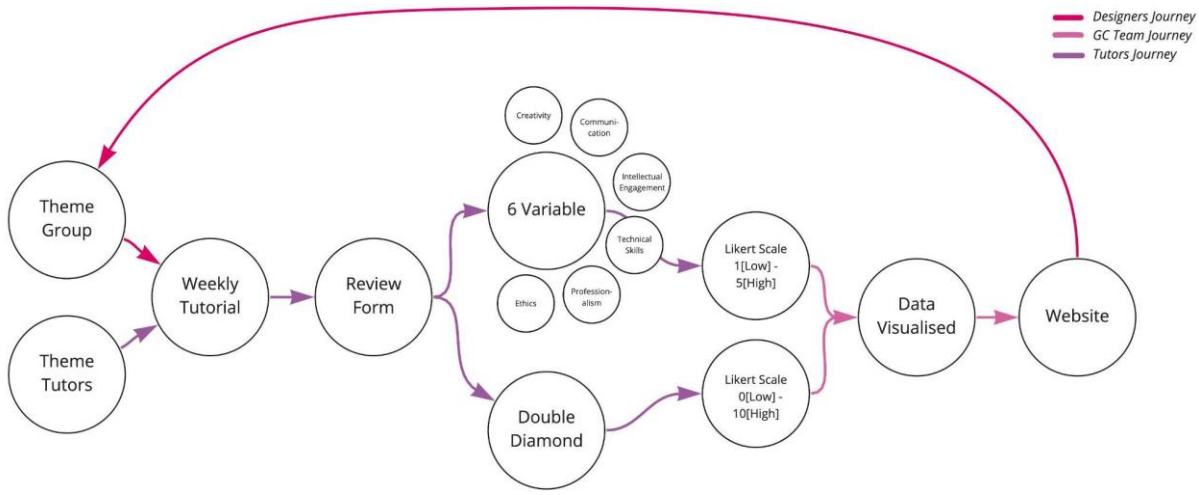

Figure 8. Assessment and Data Visualisation Process. The 77 groups were assessed weekly by 12 multidisciplinary tutors across four weeks through a google form. The feedback was then displayed on the Grand Challenge website in real-time. The visual assessment was developed in response to the different geographical locations team members were in the world, which has helped generate an organic process of learning leveraging the fact that some of the groups never met in person during the time of the research.

3.2.1 Variables Assessment

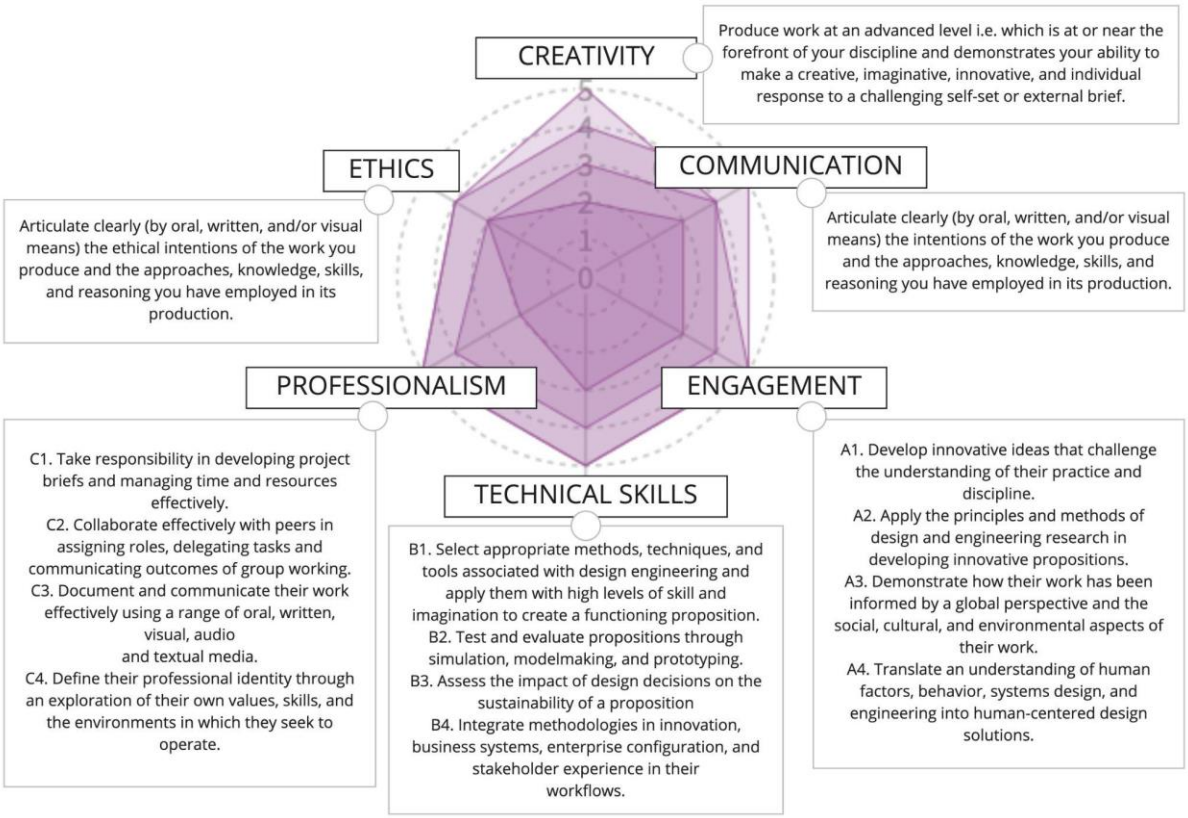

Figure 9. Variables Assessment Tool. Using a radar chart as a visualisation tool - a range of variables, including communication, intellectual engagement, technical skills, creativity, professionalism and ethics, were used to assess the progress of the research as a collaborative group effort. This was executed using Flourish, a data visualisation and storytelling software (Flourish, n.d.).

3.2.2 Double Diamond Assessment

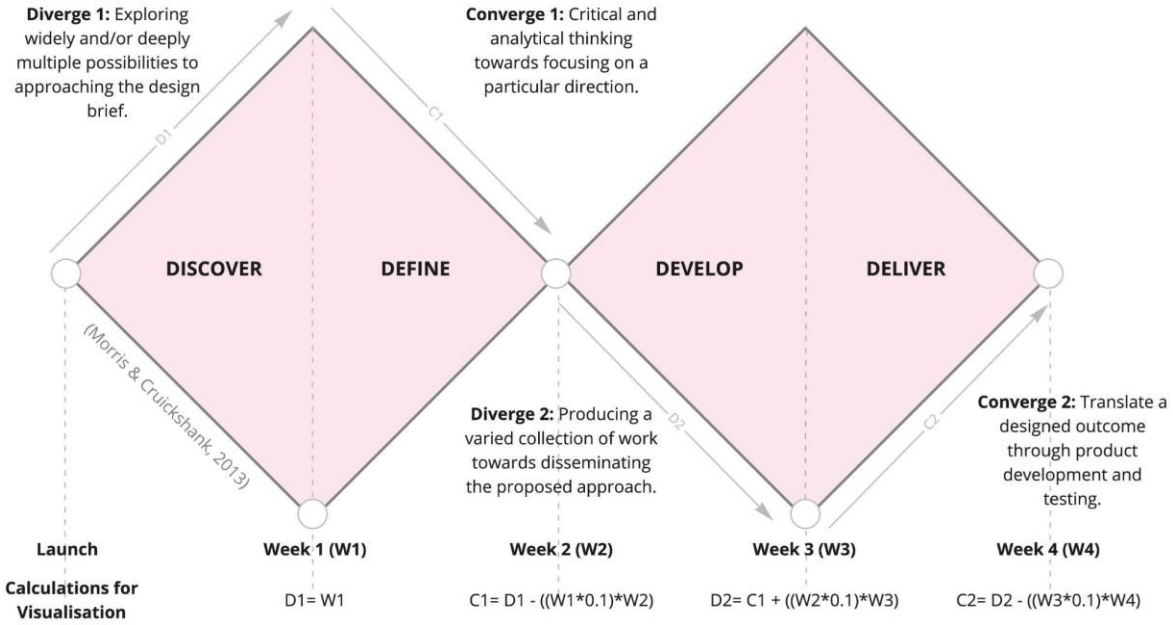

Figure 10. Grand Challenge Double Diamond. The double diamond (DD) was launched in 2004 by the Design Council in the United Kingdom as a visual framework of the design process (Morris & Cruickshank, 2013, September). Here, the Grand Challenge used the DD framework as a visual assessment tool to help guide and direct the students through the divergent and convergent design process. In order to develop the DD "effect" the calculations above were developed. These were then used and applied to an area chart (streamgraph) chart type equally using Flourish (Flourish, n.d.).

3.2.3 Example of Groups Design Process and Assessment

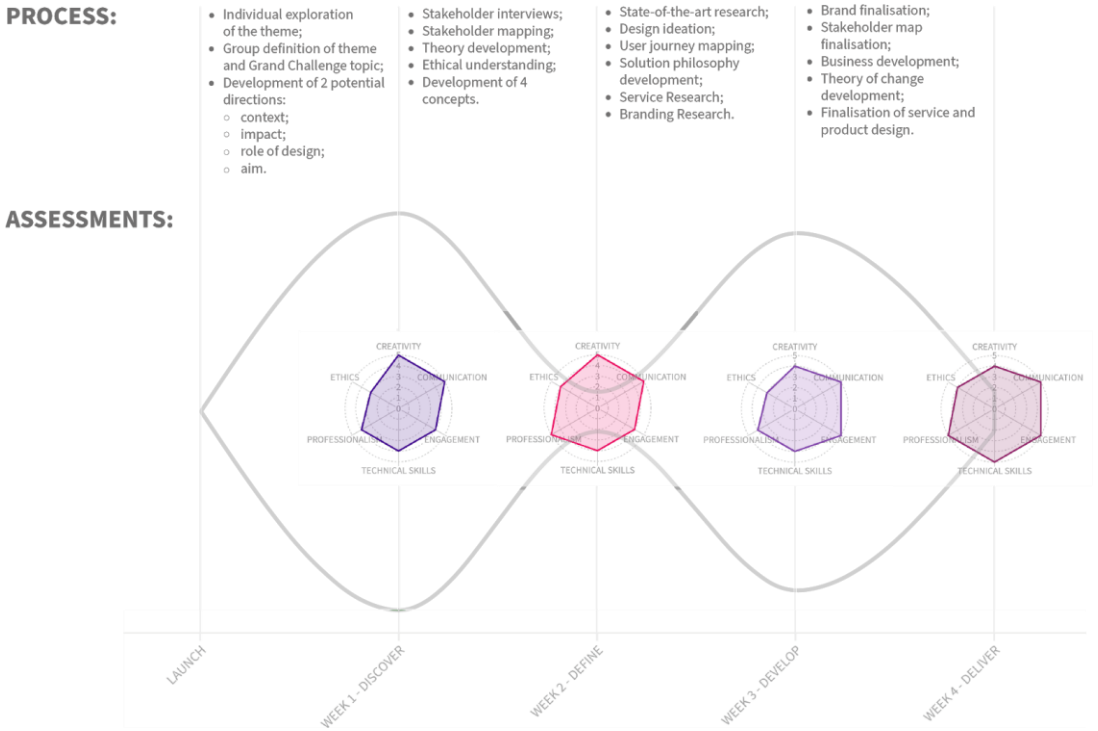

Figure 11. Expansion of G50 Weekly Performance. As illustrated in the diagram above, one of the teams, named Inaya, used various design methods and tools to systematically develop their project focus in relation to the DD diverging and converging stages. For example, using research and ideation to diverge and primary research and product development to converge.

3.3 Quadruple Diamond Action Research

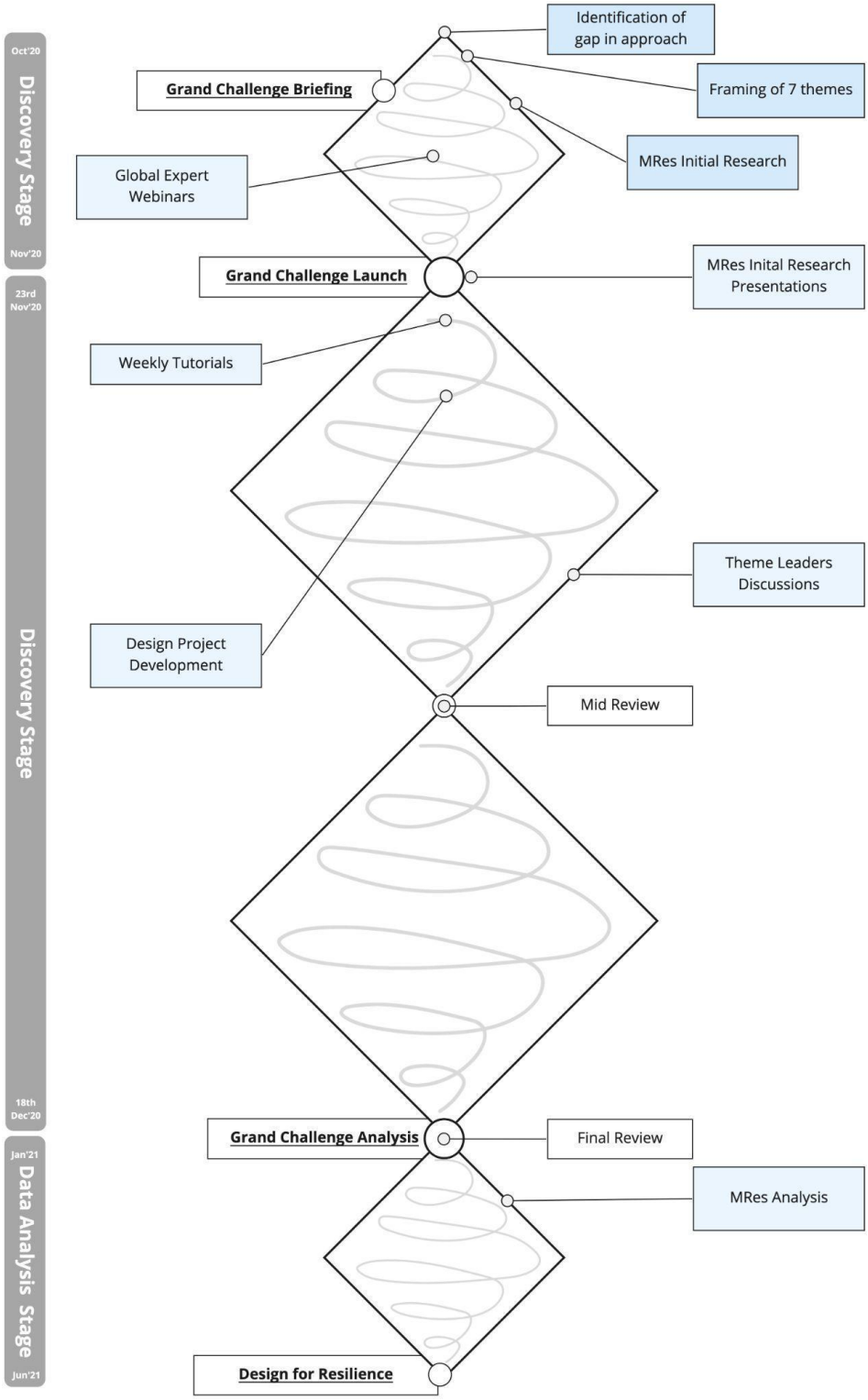

Figure 12. Quadruple Diamond Action Research. The GC was a continuous unfolding of action research which took the form of a Quadruple Diamond (QD). The extension of the double diamond (DD) has previously been developed into a triple diamond in order to include the commercial process (Chen, 2020). Centred in the middle of the QD is the unfolding of the GC, where in fact, multiple DDs took place - as seen in section 4.2. The DD process is then complemented with a diamond on either end which supported the development of the research and the collated outputs. The diagram is a demonstration of how the various interactions between designers, global experts, academics and more played a key role to the development of the GC.

4.0 Discussion

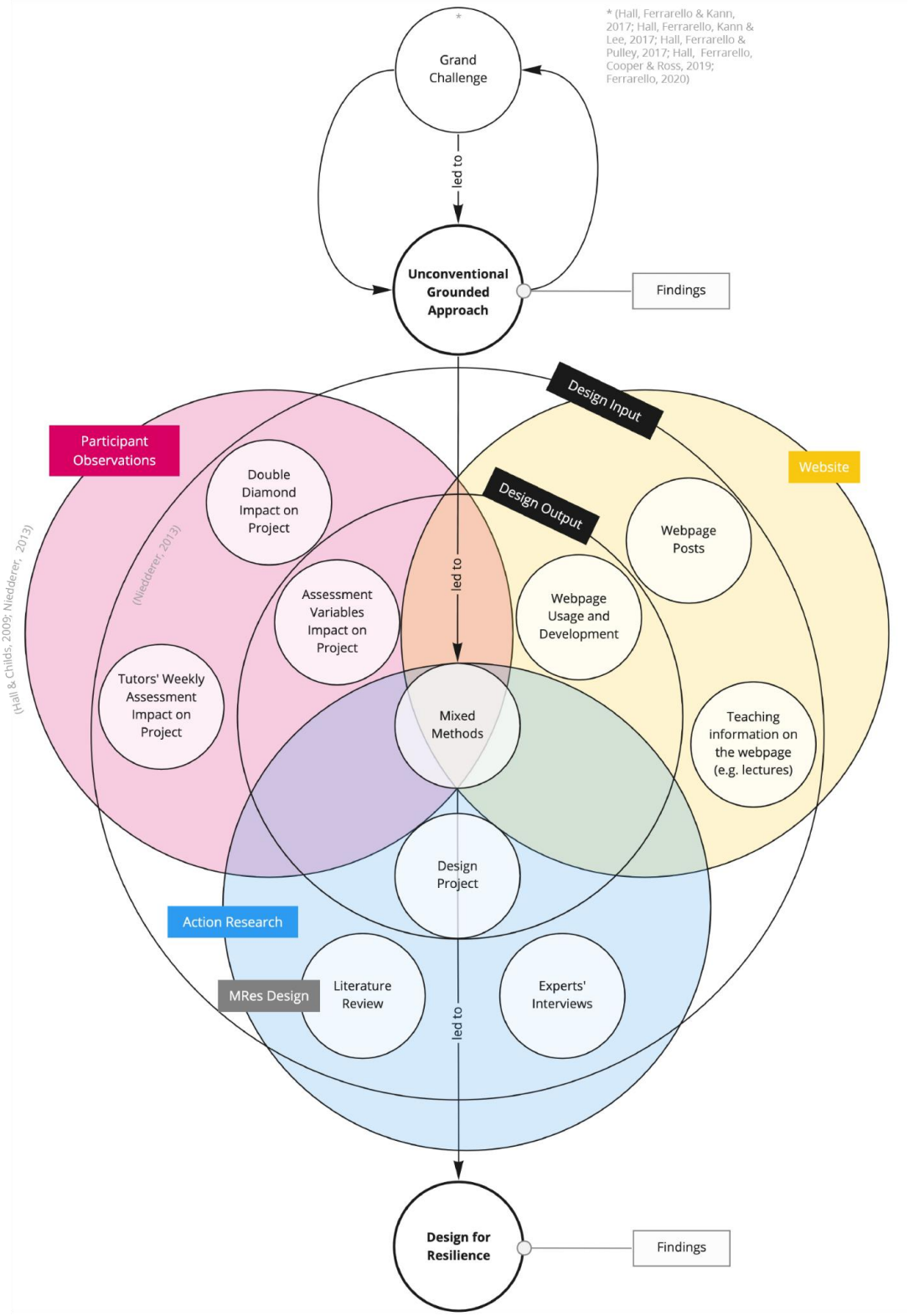

Figure 13. Discussion. Through the unconventional grounded approach, mixed methods insights were generated through a combination of design output, generated during the GC, and inputs, generated through the feedback on the experience of interacting with the GC framework, which were provided by the designers. More specifically, the MRes Design cohort developed a further input of analysing the final design projects and process while questioning where design resilience may be emerging.

4.1 Website Feedback

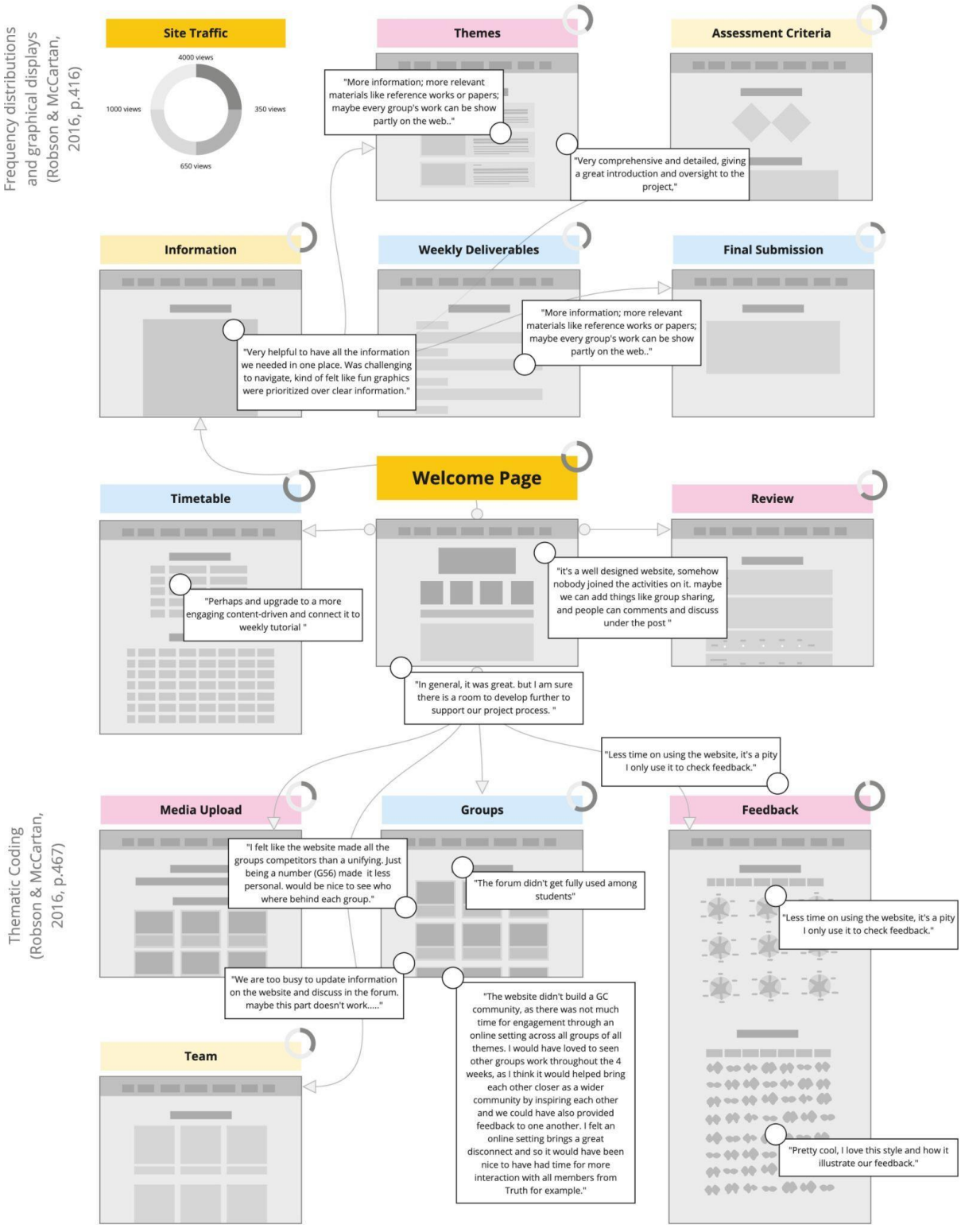

Figure 14. Website feedback. Following the end of the GC we were able to draw out the website usage through Wix's analytic tools. As we can see 'feedback', 'timetable' and the home page were understandably the most popular pages due to real-time communication. Equally, designers offered their feedback regarding how the website facilitated their journey. For them, the website was a helpful and effective tool that helped develop the projects. However, they felt that the website didn't build the "studio" community and thus more real-time features should be introduced where students could share their progress, updates and engage with one and other.

4.2 Assessment Results

4.2.1 Double Diamond Results

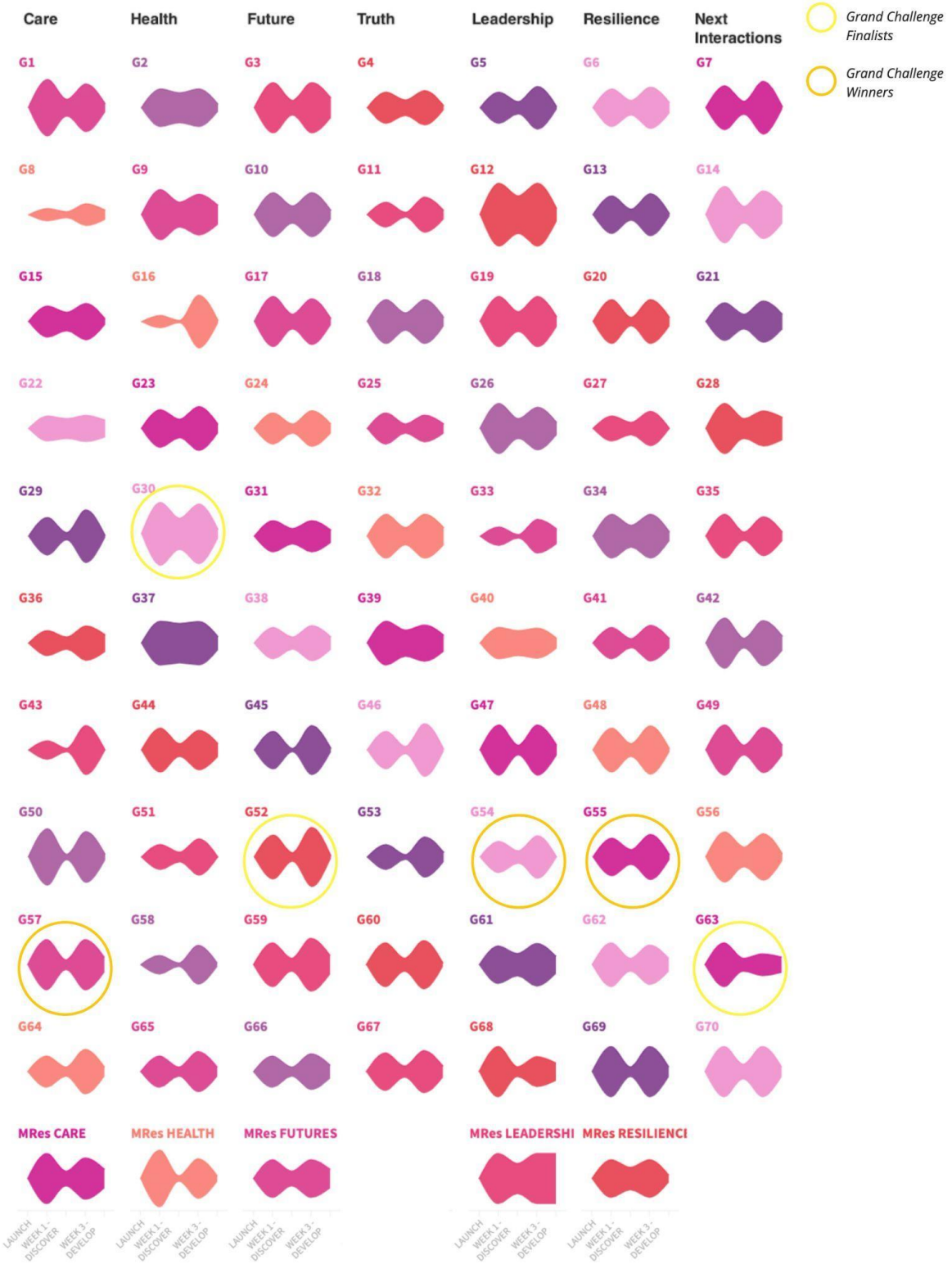

Figure 15. Double Diamond (DD) Final Results. At the end of each week, designers would be able to find their feedback on the website and see their design process' evolution in real-time. Having all the DDs displayed side by side also allowed both the researchers but also designers cross-compare their development to other groups. As we can see from the highlighted DD, GC groups that best addressed the given themes displayed a consistent high performance in diverging and converging.

4.2.1 Variable Results

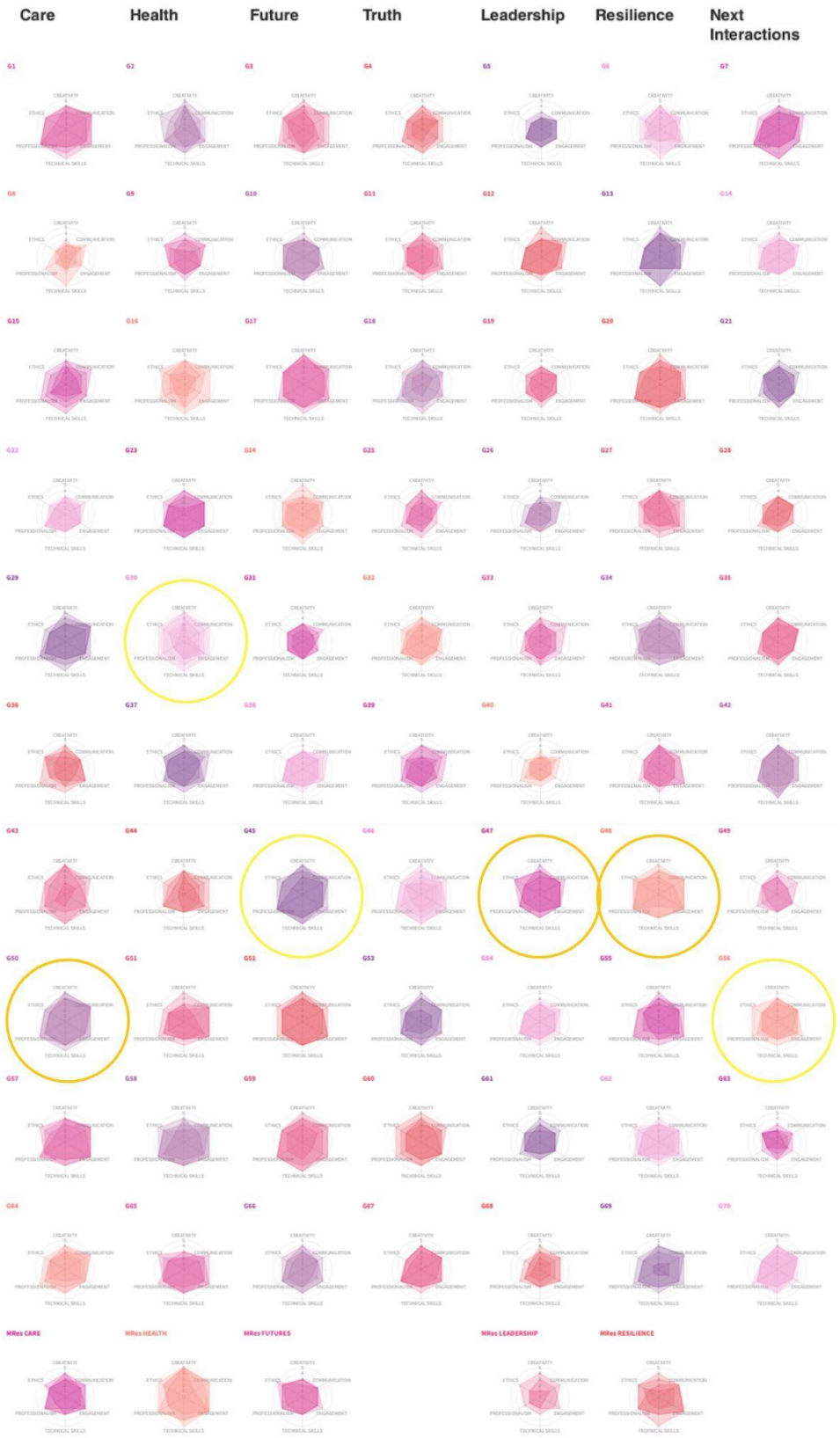

Figure 16. Variables Weekly Results. The feedback was visualised, likewise through Flourish, in the form of a radar chart where each translucent layer represents a different week. By mirroring this diagram with the DD results we can visually see how those achieving highest across the six variables would perform the best in the DD process.

4.3 Assessment Feedback

4.3.1 Double Diamond Feedback: How much did the double diamond help you process in your project?

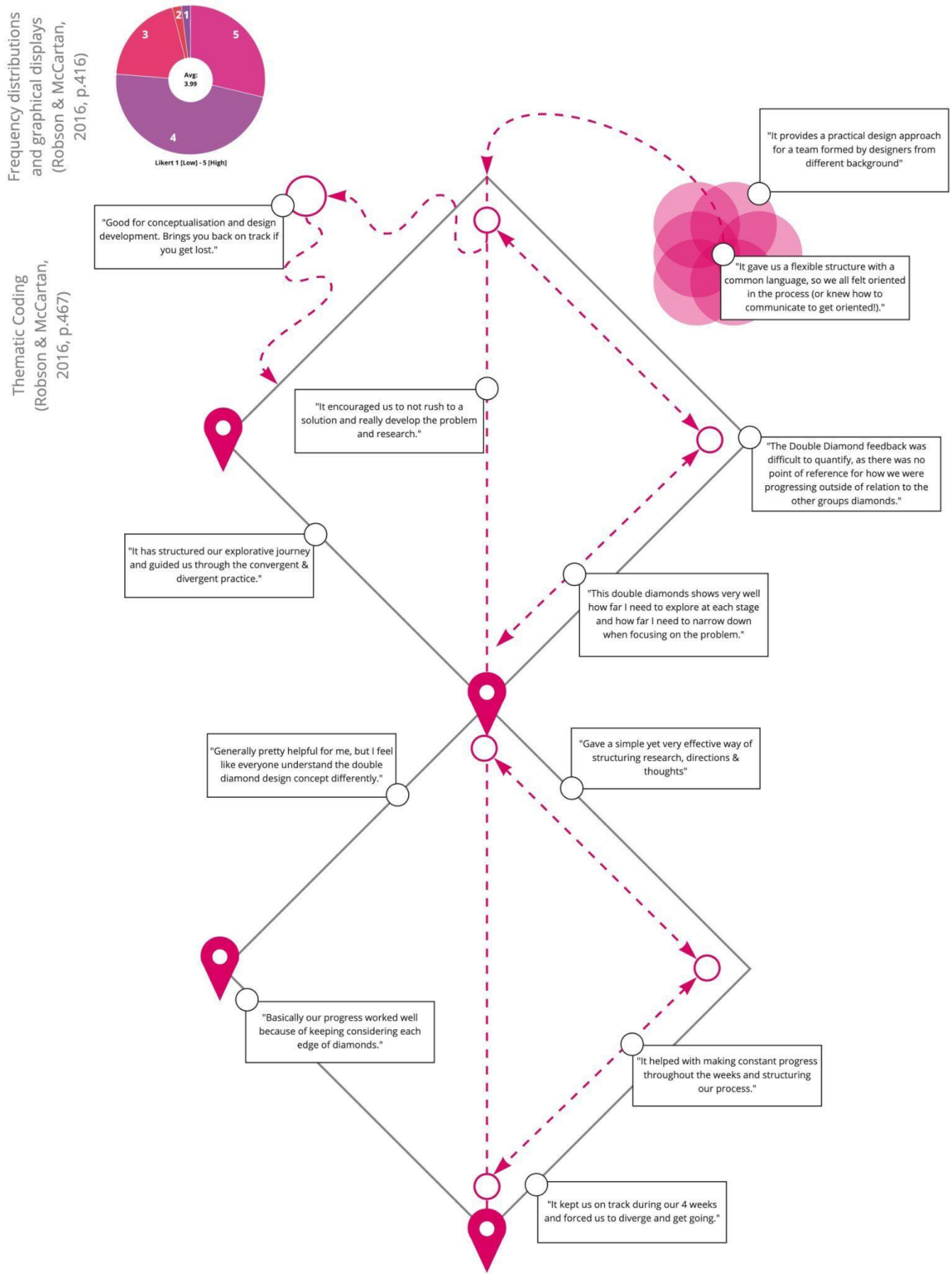

Figure 17. Double Diamond Feedback. Following the end of the GC designers offered their feedback regarding the use of the DD. Overall, designers believed that the DD offered their group an effective guiding framework throughout the duration of the project. Of course, due to the ambiguity of the DD, its interpretation was equally different for both tutors and designers and therefore was challenging in understanding the quantifiable desired direction.

4.3.2 Variables Feedback: How much did the weekly assessment help your project assessment?

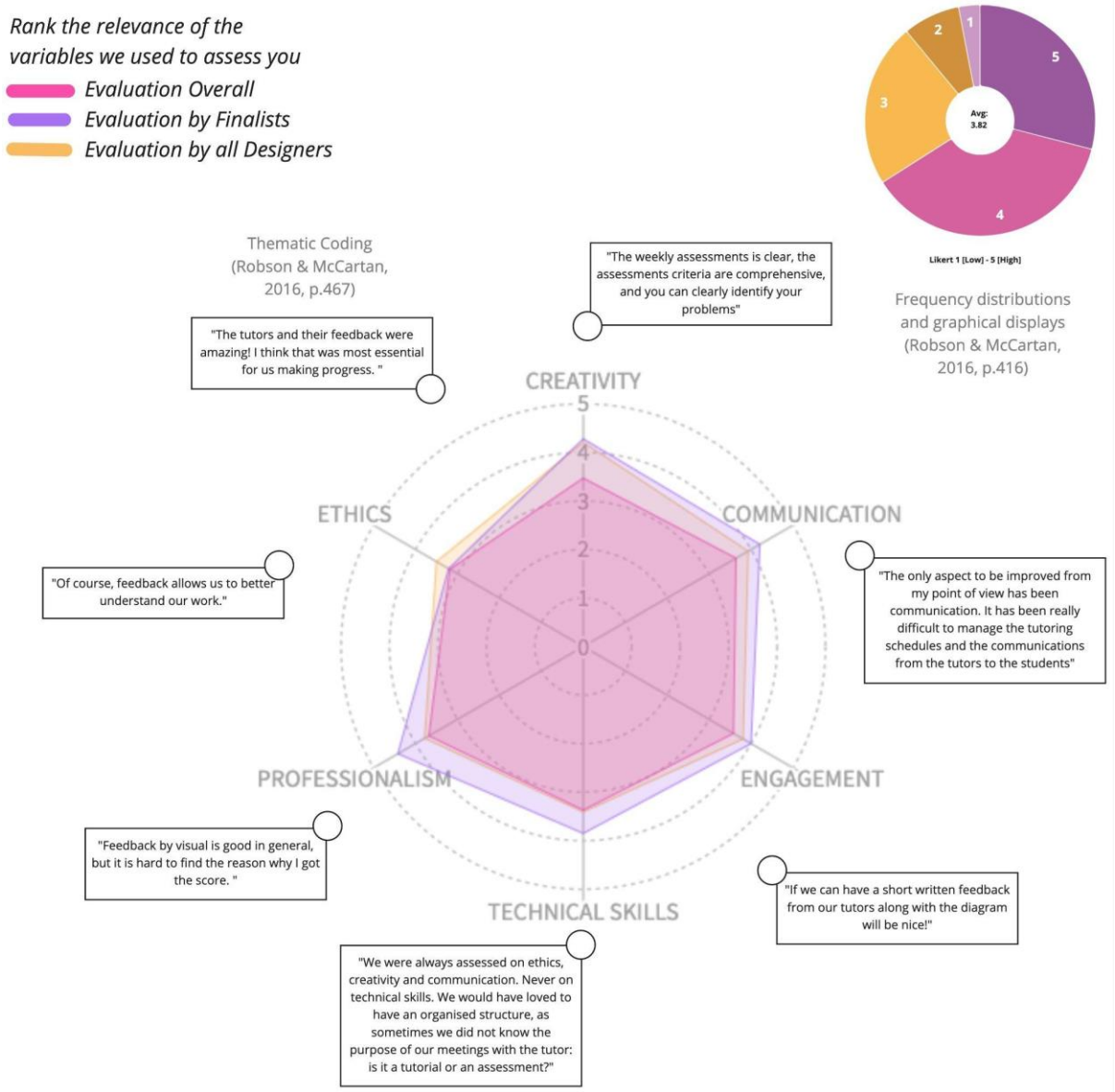

Figure 18. Variables Feedback. In the feedback form, designers were asked to rank the relevance of variables used to assess them. Overall, communication, professionalism were considered the most relevant variable. With surprisingly, 'ethics' being considered as the least relevant form of assessment. This could be considered as a reflection of the ambiguous framing of ethics in figure 3.2.1, and better framing of this must be considered. Finally, the students found that although the quantitative visual assessments were helpful, they found the lack of qualitative feedback challenging to justify their mark. Further development could consider how to simultaneously visualise both quantitative and qualitative assessments.

4.4. Towards Designing Resilience

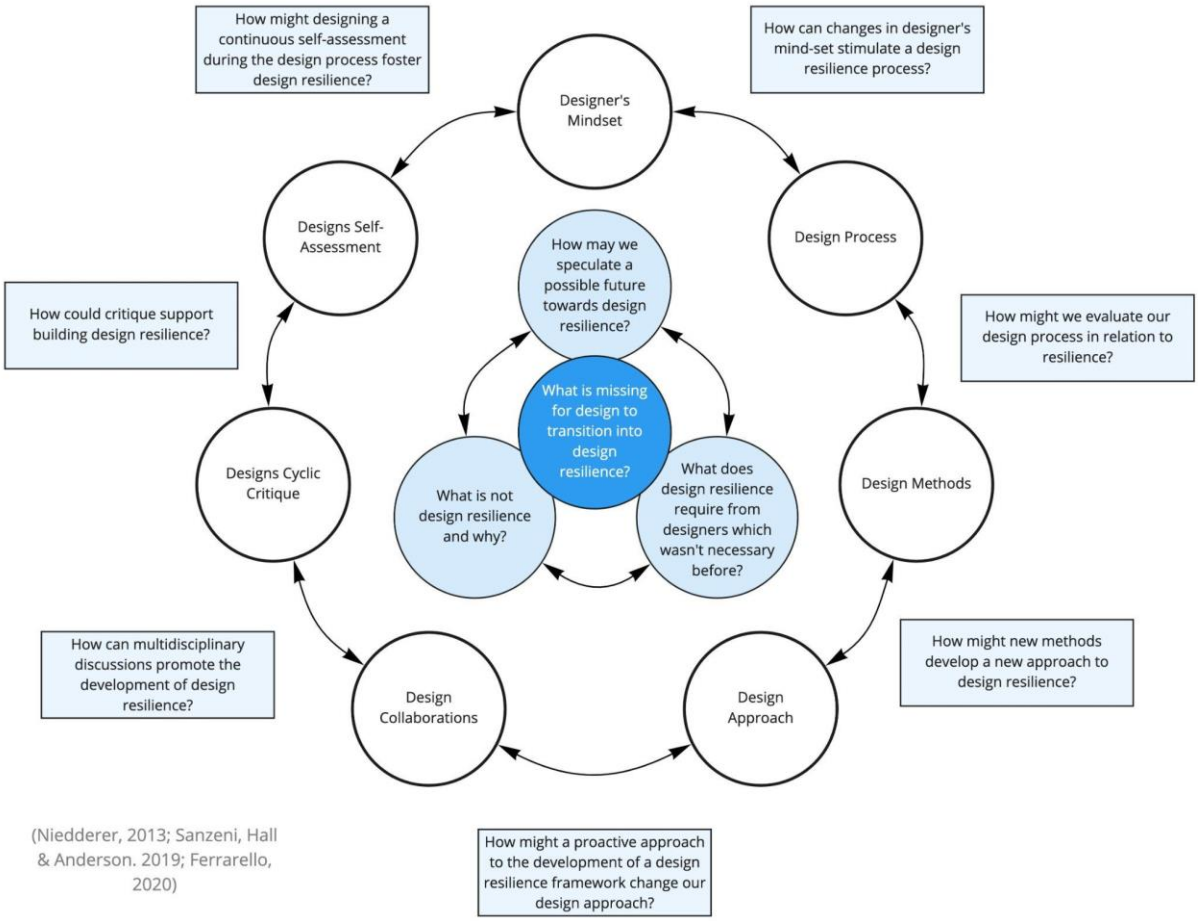

Figure 19. Key Findings. Following the completion of the Grand Challenge, an analysis was developed to understand what different design approaches emerged from the projects. This included methods, creative strategies, technologies, mediums, outcomes, definitions of design resilience, theme selection or theme groupings. The diagram illustrates an initial overview of the research questions, gaps in methods and skills, and keywords that emerged from the analysis. The diagram suggests questions towards designing resilience where we systematically unpick the design process to understand what design methods/tools/approaches should remain, which should be removed and where others should emerge. Starting by looking within - at the designer's mindset. This diagram helped the research outline any key learning able to direct more focussed recommendations for designing resilience.

5.0 Conclusion

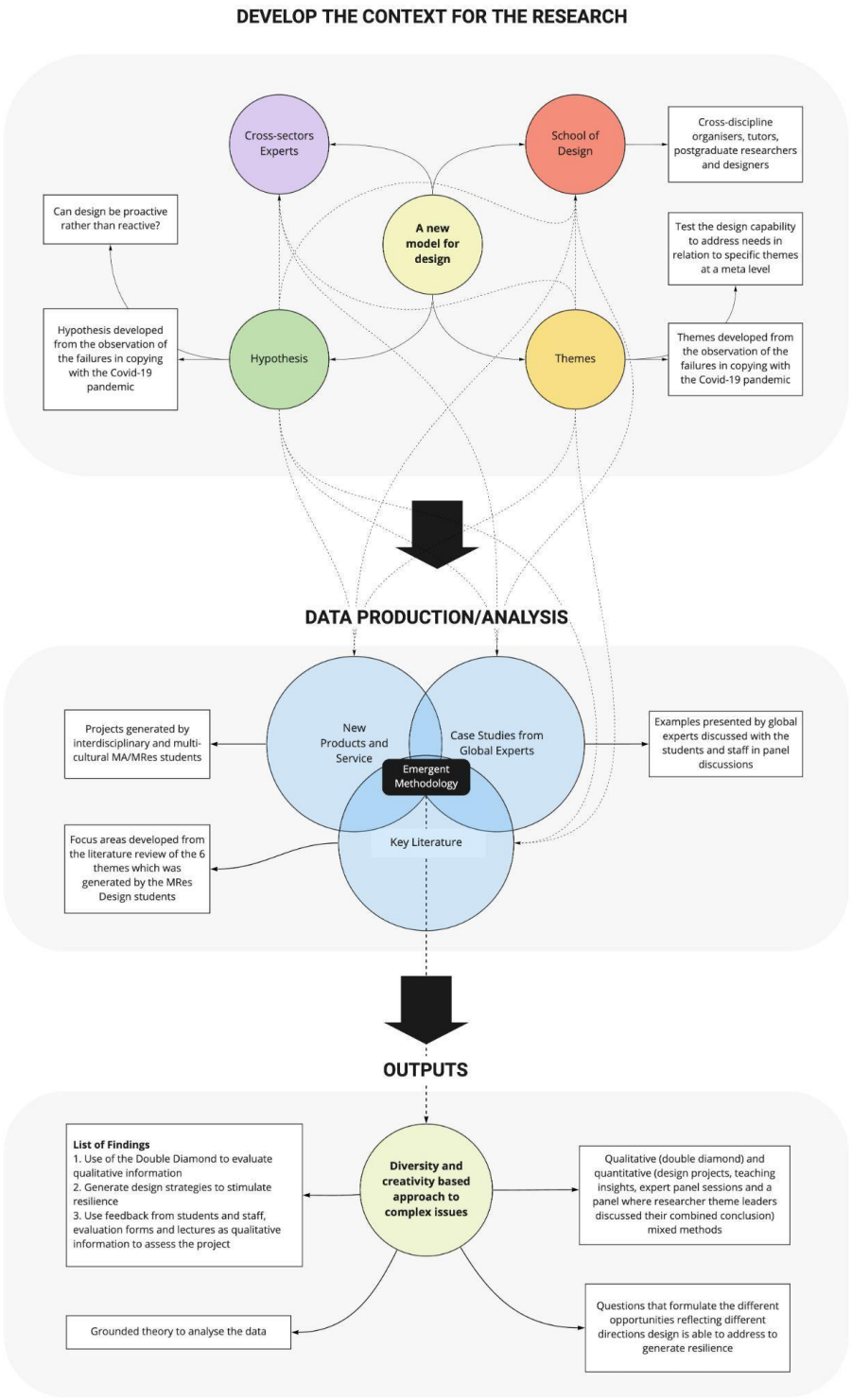

Figure 20. Mapping the research. The research started with a hypothesis looking for a new model for design. This informed the approach to the panel discussions between global experts and postgraduate designers, the literature review and the products and services that 388 interdisciplinary and multicultural groups generated to respond to the challenges related to the themes. Starting with a hypothesis driven approach allowed the research to undertake an explorative and experimental process which helped harness the knowledge of the interdisciplinary groups working remotely from different regions in the world. This approach, which took shape through the interactions between academic, technical staff, postgraduate designers and global experts, created a method that tackles societal issues through diversity and creativity.

References

Anderson, P., Hall, A., & Ferrarello, L. (2018). Foresight Review on Design for Safety.

Buchanan, R. (1992). Wicked problems in design thinking. Design issues, 8(2), 5-21.

Cross, N. (1982) 'Designerly Ways of Knowing' Design Studies vol 3 no 4 October 1982 pp. 221- 227

Chen, M. (2020). The Zendesk Triple Diamond process. Medium.

Ferrarello, L., Hall, A., Kann, M., & Lee, C. H. (2017). Collaborating Design Risk. Re: Research IASDR 2017, 375-388.https://medium.com/zendesk-creative-blog/the-zendesk-triple-diamond-process-fd857a11c179

Ferrarello, L., 2020,. Fostering a learning experience that improves knowledge exchange between academia and industry. In Proceedings from the International Conference on Engineering and Product Design Education, Herning, Denmark. University College, Herning, Denmark.

Flourish (n.d.) https://flourish.studio/

Foth, M., & Axup, J., (2006). Participatory Design and Action Research: Identical Twins or Synergetic Pair? In Jacucci, G, Kensing, F, Wagner, I, & Blomberg, J ,(Eds.) Participatory Design Conference 2006: Expanding Boundaries in Design, August 1-5, Trento, Italy.

Hall, A. & Childs, P. (2009). Innovation design engineering: Non-linear progressive education for diverse intakes. International Conference on Engineering and Product Design Education, September 10-11, University of Brighton, UK, pp 312-317.

Hall, A., Ferrarello, L., & Kann, M. (2017). Safety Grand Challenge: Safe ship boarding and Thames safest river 2030.

Hall, A., Kann, M., Ferrarello, L., & Pulley, R. (2017). Encouraging Creative Risk to Reduce Risk to Life.

Hall, A., Ferrarello, L., Anderson, P., Cooper, R., & Ross, C. (2019). Designing Design for Safety: How emergent methods indicate new safer future design practices.

Hofstede, G., (2011) Dimensionalizing Cultures: Hofstede Model in Context. Online Readings in Psychology and Culture, 2(1). http://dx.doi./ org/10.9707/2307-0919.1014

Lewin, K. (1946) Action research and minority problems. J Soc. Issues 2(4): 34-46.

Morris, L., & Cruickshank, L. (2013, September). New design processes for knowledge exchange tools for the New IDEAS project. In The Knowledge Exchange: an interactive conference. - https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond

Niedderer, K., (2013). Mindful Design as a Driver for Social Behaviour Change. Proceedings of the IASDR Conference 2013, Tokyo, Japan: IASDR, 2013.

Robson, C. & McCartan, K. (2016) Real world research: a resource for users of social research methods in applied settings. Fourth Edition. Hoboken: Wiley.

Sanders, L. (2008). An evolving map of design practice and design research. Interactions, 15(6), 13–17. https://doi.org/10.1145/1409040.1409043 [accessed March 2021]

Sanzeni, F., Hall, A., & Anderson, P. (2019). Future Forecasting Wicked Problems: A New Framework For Design. In DeSForM19 Proceedings. PubPub. https://doi.org/10.21428/5395bc37.c6a3cb86 [accessed March 2021]

Spinney, L. (2017). Pale rider: The Spanish flu of 1918 and how it changed the world. PublicAffairs. https://doi.org/10.31234/osf.io/n4vmb [accessed March 2021]

Spinuzzi, C., 2005. The methodology of participatory design. Technical communication, 52(2), pp.163-174

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