

HEALTH FUTURES LAB: TRANSDISCIPLINARY DEVELOPMENT OF T SHAPED PROFESSIONALS THROUGH 'WICKED PROBLEM' CHALLENGES

Adam de Eyto^{1,4}, Annmarie Ryan², Muireann Mc Mahon¹, Grainne Hassett³ and Morgan Flynn³

¹ Design Factors – University of Limerick, Ireland

² Kemmy Business School– University of Limerick

³ SAUL– University of Limerick

⁴ adam.deeyto@ul.ie

Abstract: It is clear that differences in approach and enquiry are apparent between the established disciplines of Design, Engineering, Business and Health Sciences. The attempt to tackle *Wicked Problems* (Rittel and Webber 1973) is a challenge for universities and policy makers yet we are only beginning to appreciate the potential of transdisciplinary collaboration. This paper outlines a case study in a transdisciplinary education model which addressed some of the *wicked problems* of health and wellbeing of urban citizens, using Limerick city, Ireland as a test bed. The *Health Futures Lab* [HFL] was a pilot initiative that brought recent graduates of Interactive Media, Engineering, Product Design, Architecture, Economics, Marketing and Health Sciences together to apply their professional skills in a transdisciplinary manner. The lab ran for a five week period in the summer of 2014 and was situated in the city core. Facilitation and expert mentoring was given by university faculty, and a range of community advocates. This case study examines the benefits and challenges of transdisciplinary labs as a method for addressing complex social problems and provides an example of how graduates can use their specialist knowledge whilst collaborating across disciplines for maximum effect.

1 INTRODUCTION

How our public services and professional disciplines are arranged is at odds with the (wicked) problems we face in the 21st century. Public services in Ireland and elsewhere have traditionally been arranged around specific disciplines, like transport, education, health, enterprise or the arts. This is confounded in our education system, which, in the main, remains highly fragmented around specific uni-disciplinary specialities, such as science, engineering, design or business (Ramadier, 2004, Max-Neef, 2005). In these settings we can only ever achieve a kaleidoscopic view of issues we face in common like environmental decay, youth employment, or regional development. This further results in a partial understanding between disciplines. Yet some issues we face cannot be solved by individual professions. It is also clear that multidisciplinary is not enough to generate transformative solutions. In this paper we report on one example of a project that was initially designed as a multidisciplinary project, but which we argue achieved transdisciplinarity. This transdisciplinarity was partly due to design thinking being used as the coalescing device.

According to Ramadier (2004) multidisciplinary work brings complementary disciplines into a situation where plurality is respected. Interdisciplinarity on the other hand involves the transfer of knowledge from one domain to another. Neither offer the kind of innovation needed for complex problems. Transdisciplinary approaches are said to bring about new knowledge by not only acknowledging multi-disciplinarity but in actively aiming at a controlled conflict between disciplines. Achieving this sort of transdisciplinary state is not an easy task. It needs new methodologies (Ramadier, 2004), and safe spaces where disciplines can *be brought to bear around*

pertinent complex issues. The results of the work are novel, in that they not only provide tentative contributions to complex problems, but offer novel delineations of what constitutes 'the problem' under discussion.

2 BACKGROUND

The following section contextualises the work in current research into collaboration and problem solving. Wicked problems are defined as *'multifaceted and complex problems whose incomplete or contradictory nature is such that each attempted solution often seems to create a new problem'* (Berger 2009, p.307). These complex 'problems' react in a non-linear and unpredictable fashion and often result in unintended outcomes (Design Council 2006, Kiernan & Ledwith, 2014). Wicked problems do not lend themselves to quick resolution as they stem from complex social issues that revolve around the unpredictability of human behaviour and the conflicting value system each person holds (Kolko 2012, Rittel 1973). They have been characterised as complicated problems without clear (or indeed any) solutions, as every solution offered presents new symptoms and resultant problems (Nelson and Stolterman 2003, Rittel 1973, Kolko 2012).

The ideal model for tackling wicked problems is the transdisciplinary model. However this is difficult as it needs compromise on all sides and a common language that moves beyond disciplinary nuances. Since, as discussed in the introduction section, trans-disciplinary approaches in education are rare, practitioners can revert to specific disciplines (Clark et al. 1995). It may be that compromises are perceived as so great that no discipline feels their needs are being met. Thus what is needed is a means of highlighting the connections and interdependencies that already exist between disciplines to find ways of building new connections that make sense to all sides. Warburton (2003) observes that a real opportunity exists to find methods of bridging and reconciling diverse perspectives to create real cross-disciplinary approach.

3 THE HEALTH FUTURES LAB

The five-week long **Health Futures Lab** focused on trans-disciplinarity, creativity, innovation and the uncovering of new areas. The subject was 'Innovations in Health and Well-Being for Limerick City'. We located in the city centre so the researchers could access the field easily. This simple move also allowed key stakeholders to 'drop in', engage and co-imagine solutions around the challenge.

3.1 People

The research team comprised 14 recent graduates (within two years) of the University of Limerick: equally drawn from Economics, Marketing, Architecture, Engineering, Interactive Media, Product Design and Occupational Therapy, either undergraduate or postgraduate courses. A team of discipline specific facilitators from across the disciplines guided the process. Additionally a two person facilitation team oversaw day-to-day activities and helped researchers move through the project process, offering expertise and encouragement to push beyond perceived limits. At the start a Charter was adopted; this set rules of engagement for all researchers for the project and interpersonal dynamics.

3.2 Processes

The structure of the HFL followed a Design Process. This is characterised by a number of key elements that set it apart from other problem solving processes. Within the design process there is a focus on figuring out through doing, on making things, and on testing through iterative development. It is a process open to change and comfortable with uncertainty. It is a non-linear process. It is in continuous flux. There needs to be acceptance from those unused to it that these states are essential and that they do not mean things are going nowhere. Reflection, critique and constant questioning ensure all ideas are robustly tested. Ultimately one or a number of solutions that best address the brief emerge. The HFL process relied on domain specific knowledge researchers could add order to bring novelty to the situation (Fallman 2003, Kelley 2000). This prior knowledge was fused with skills, understanding and imagination, as well as risk-taking, problem-finding and innovation (Potter 1980); skills and capacities that were inculcated through the HFL process.

3.3 Outputs

Three important proposed themes emerged from the project. Each of the propositions offered independent interconnected ways to address pressing issues around Health and Well-Being experienced Limerick citizens.

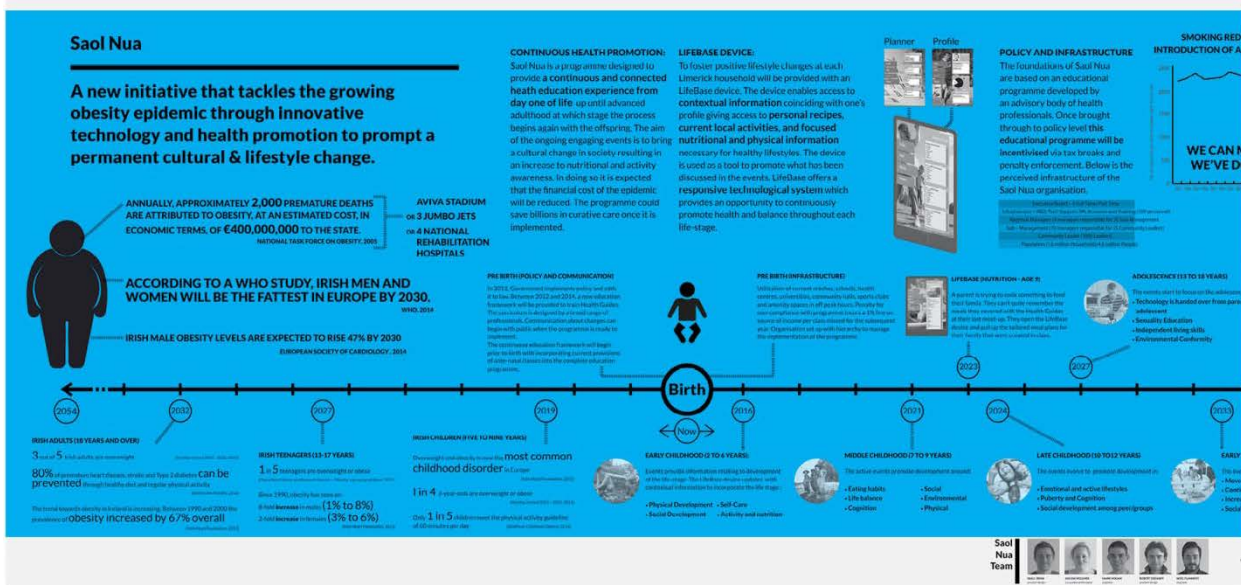


Figure 1: Saol Nua (New Life) Proposal:

A new initiative tackling a growing obesity epidemic through innovative technology and health promotion to prompt a permanent and personalised cultural and lifestyle change from Day Zero in a person's life

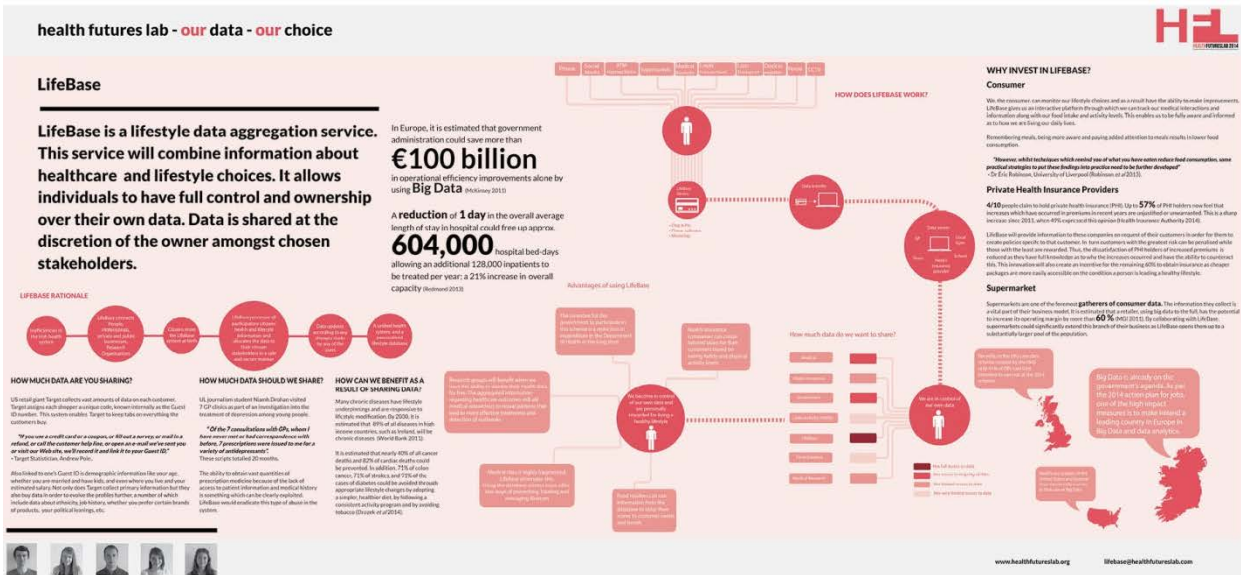


Figure 2: Life Base Proposal:

A service to ensure timely and aggregate flow of information through a person's life as they interact with the health system

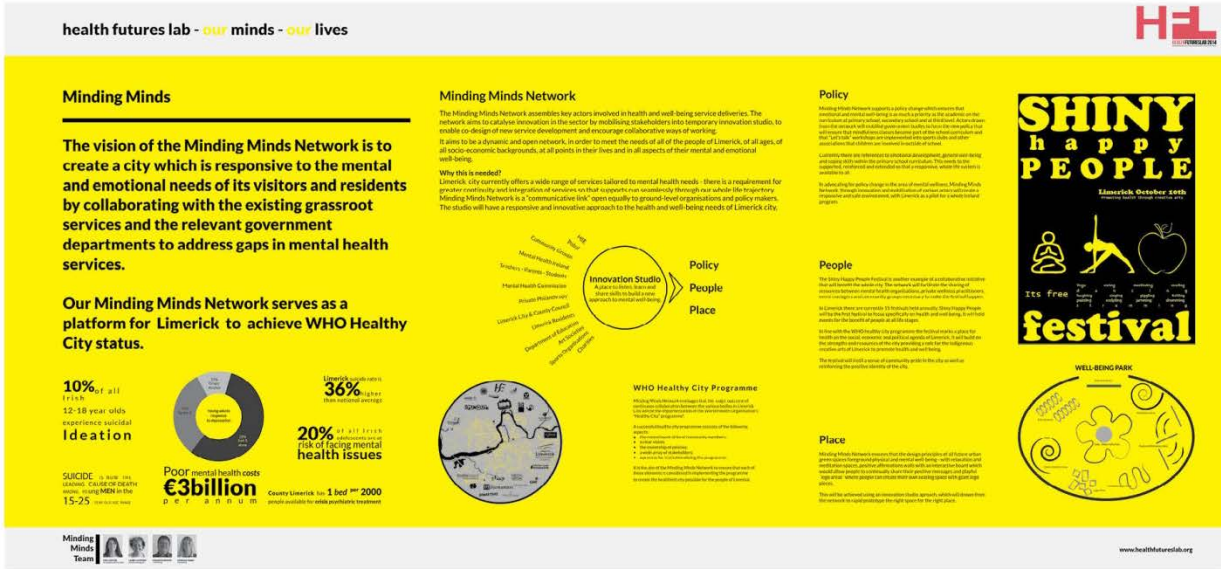


Figure 3: Minding Minds Proposal

A city-wide policy to introduce preventative measures and increase resilience amongst grassroots organisations that focus on mental well-being

The final output of the HFL was a pop up exhibition. Three large graphic posters (Figures 1-3) explained the three proposals. Additionally a floor-based graphic image timeline was made to act as a focus for discussion and illustration. It highlighted key moments in a fictional person's life. The stories of these moments explained the pivot points where interventions offered by one, two or all of three proposed solutions might have prevented or lessened health impacts one might face throughout a life. Thus HFL proposed a bold future for health in Limerick City and a detailed roadmap on how we might get there.

3.4 Collection of Data

Data collected for analysis was on a qualitative basis. This was done in order to understand the 'lived' experiences of the participants. An 'Ethnographer' was employed as an independent researcher to record the processes, follow the ideas and observe behaviours. The participants were interviewed at various intervals throughout the process. The data was then mapped and analysed to identify key themes and trends. Through this unpacking process the facilitation team began to understand how it could be modified and applied across longer-term projects that are situated in different research areas.

4 OBSERVATIONS

The key observations extracted from the data collected are around the processes and experiences of the researchers as they moved through this process.

4.1 Uncertainty/ Unpredictability

The experiences of the HFL may not be universally applicable to other situations, as the same lab run again under similar conditions would yield different outcomes. This could be attributed to personalities of the participants involved (both the research and facilitation teams) and the dynamics between these individuals and the collective; the environment, settings and conditions in which the HFL took place as well as external influences and the zeitgeist. Where people are involved situations are 'uncontrollable' and 'variable'. Individuals have different experiences, bring different worldviews and frames through which they perceive and experience situations.

However there are some aspects which are likely to emerge in all similar situations. It became quite apparent as the project evolved that there wasn't always a shared understanding amongst all the researchers. This is inevitable, as individuals will interpret representations (images, models, written text, and spoken words) and conversations according to their own experiences, interests and backgrounds (Lahti 2007). The evidence purports that there was a great deal of personalisation during the experience and even, through recall in the interviews, each individual viewed the experience through a unique lens. On reflection, researchers realised the benefits of dealing with situations and concepts that pushed them beyond their preconceived limits.

Much of the literature converges on the topic that participants, undertaking a design thinking process should be comfortable with ambiguity, uncertainty and incompleteness (Denton 1997, McDonnell 2012, Kelley 2000). Graduates irrespective of discipline, need to be flexible and agile enough to function within a system that is in a constant state of flux.

4.2 Ideas

At the introduction of the Health Futures Lab, the following five points and Figure 4 below were presented to the participants to describe an approach to the development of ideas.

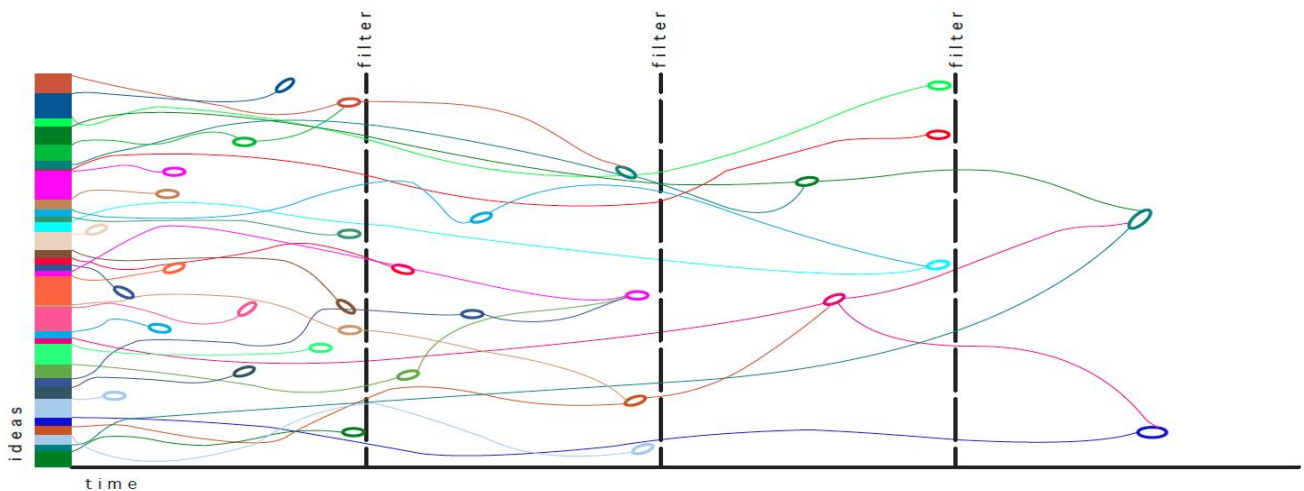


Figure 4: Evolution of ideas - dying, surviving filters, combining, changing, re emerging

- *Start as wide as you can – there are no bad ideas, do not edit yourself*
- *This is not a linear process – we will go down what seem like blind alleys, go back on ourselves, resurrect what seemed like dead ideas, this is the nature of the process*
- *Describe the existing condition*
- *Model a new reality*
- *This is a safe place to ask questions, to answer questions, a safe place to fail, so take risks*

The rule that all ideas had to be presented as a product – drawing, diagram, text – rather than just talked about was established. This resulted in idea trumping the personality; the best ideas would emerge from presentation, critique and reiteration. In theory the lab was to be a fertile ground for any idea, and these could be tested by anyone. In practice, the process was more complex. Ideas had advocates amongst the participants and the skills of presentation, selling and even bloody-mindedness of their owners influenced whether ideas survived or otherwise. While defending ideas is part of the critique process, participants sometimes became overly possessive around certain ideas. This sense of individual ownership of ideas could isolate researchers. The timing of the emergence of ideas also influenced ideas carried forward – external inputs energized new thought. The mechanism of presenting ideas as product allowed some distance to emerge between ideas and advocates and neutralize to a certain extent some of the issues described above.

4.3 Expertise/ Disciplines

It is perhaps a little pedantic to differentiate between multi, inter and transdisciplinary but the subtlety is an interesting one as different learning strategies affect how graduates collaborate on wicked problems. During the HFL the researchers and facilitators experienced elements of all three via the normal *forming, storming, norming* and *performing* dynamics of the team development process (Tuckman 1965).

Within each of the categories of multi-disciplinarily, trans-disciplinarily and interdisciplinary the dominance of a particular discipline may shift over time. Indeed this is often influenced by the vagaries of group dynamics and the perception of what the joint mission is. It is also relevant to note that the perception around who is leading and who is led, who is paying and who holds authority is strongly influential. That said, initial respect for the differences of each discipline mutated into silo type practice when deadlines approached and teams had to demonstrate output. To counter this the teams were remixed quite deliberately on a regular basis to break down the disciplinary bias that could potentially develop.

A number of factors are worth noting here. The group consisted of relatively young graduates, led by academics some ten to twenty years older. The age profile of both cohorts is worth remark. Whilst it could be inaccurate to assume the younger cohort lacked life experience, and that the older cohort were already entrenched, the lack of experience of a non-academic environment is relevant in both cases.

This naivety manifested in the graduates around their understanding of cause and effect dynamics. Real human behaviour and how humans might respond to designed services or things lacked insight. Without workplace experience, they lacked a strong conceptual framework to springboard service design or user design or its execution.

The model was also influenced by the professor-student relationship and drifted frequently into educational mode. As the project progressed from day to day the impetus was looser than it would be in a deadline driven working project playing out in the market. The latter would be circumscribed and driven by the strictures of delivery and economic constraints. In a workplace deadline driven environment, two common modes of work are to either decide first and execute later, or to start execution whilst maintaining an open adaptive attitude to change and development. Both are executed with a strong attention to economic, time and client based dynamics.

It is of real interest to speculate on the differences between a project run without these structures, and one which is conceived through them. There may be a perception that the former is a more pure mode of working, but this would be to presume that context and human relationship factors have no influence.

The questions of who decides, and what the perceived goal is more bound up with who holds authority than any single discipline. In this fast paced trail, the team was wide and involved seven separate disciplines. The subject area was ambitious. It was inevitable that an easy to grasp goal and leaders would emerge.

As the Lab model set design thinking at its core, those disciplines (interaction design, product design, and architecture) most familiar with this should have been most comfortable. In practice, whilst they may have at least grasped the concept more clearly, their struggle to bring colleagues with excellent ideas from other backgrounds (medical and marketing and economics based) with them was their particular challenge.

4.4 Facilitation

A challenge of transdisciplinary work arises around the facilitation of groups to be dynamic, flexible and constructive. Many experts are uncomfortable in situations where the parameters are not clearly mapped out in advance. Not all educators and professionals can slot in to this mode of working. Facilitation skills take time to develop, usually through learning by doing and reviewing. Though patience, open listening skills, communication skills and both general and specific expertise are all necessary, a certain amount of leadership is also key.

Preparation: Attention is needed to prepare for work within a transdisciplinary environment. When dealing specifically with *wicked problems* there is a risk of over-direction and over-preparation of the proposals by the

facilitators. That said, the teams, space and charter need some preparation, and some sharing of this with the researchers will help form group identity. In advance of the formation of a group it is essential that the facilitation team agree on the specific mix of disciplines and character types which might benefit the challenge.

Space: Allowing space for the group to develop its identity is critical. Some facilitation of this can be achieved through group games and icebreakers but real trust forms over time as individuals begin to work together and establish where strengths lie. *Space* in this context refers to the schedule of time on the project and the conscious facilitation of a balance of *work time* and *offline time*. It is often in the peripheral spaces of offline time over a coffee break or walk on the street that individuals make the connections that are a trigger for a breakthrough in the work. The HFL was deliberately held in an unused city centre industrial building as it allowed for a physical and emotional connection with the city and civic society. The facilitators chose the building as a new physical space unfamiliar to them or the researchers to encourage the development of a new set of norms and working practices.

Conflict: Perhaps one of the greatest challenges for facilitators is dealing with group and individual conflict. It is important to recognise that not all conflict is negative, it often shows that a group is reaching a critical point of decision or a pivot (McDonnell 2012). Conflict can force groups to decide and commit to an idea or for individuals to express themselves more succinctly. Conflict can be an agent for progress but it can also be corrosive to a group dynamic.

5 CONCLUSIONS

An attempt was made to quantify the observations described above. This generated a series of diagrams describing the phenomena changing over time. These diagrams became a tool to refine the observations into a set of key variables.

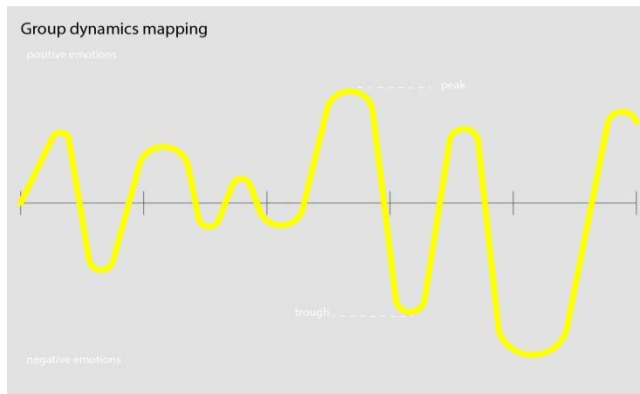


Figure 5: Group Dynamic Correlates with the observations described under the heading of Uncertainty.

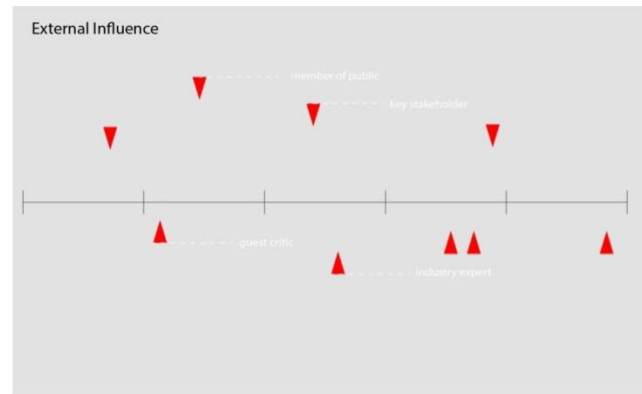


Figure 6: External Influence Correlates with the observations relating described under the heading of Ideas.

Further refinement is needed to improve the accuracy and usefulness of these diagrams as a metric. The next iteration of the process could adjust variables and measure the influence that these adjustments had on both the process and the outputs, acknowledging the complexity of this task given the many other variables at play.

The five-week project outcomes acted as case studies (albeit on a small scale) of what can be achieved and what processes can be employed when a variety of voices connect to address contemporary challenges. Health Futures Lab's most successful output was human embodied knowledge; it did bring together a collection of voices who explored existing issues, unearthed new opportunities, reframed questions and proposed solutions that could not have been imagined through a single disciplinary lens.

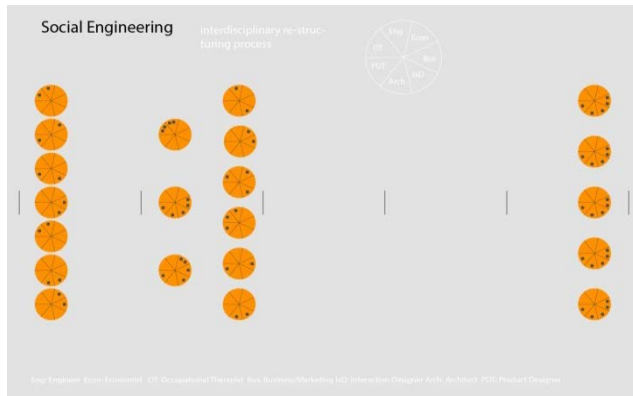


Figure 7: Social Engineering Correlates with the observations under the heading Disciplines/Expertise.



Figure 8: Critique Timeline This was the most explicit measurement of the role of Facilitation.

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