THE POTENTIAL OF DESIGN THINKING TO ENABLE CHANGE IN HIGHER EDUCATION.

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Abstract.

Over the past decade, Design Thinking has gained increasing attention from practitioners and academics from across many sectors and disciplines for its ability to foster innovation and tackle complex challenges. Design thinking has been defined as a "human-centred approach to innovation that puts the observation and discovery of often highly nuanced, even tacit, human needs right at the forefront of the innovation process" (Gruber et al., 2015). While there is increasing evidence that design thinking delivers value to firms trying to innovate and to societies trying to make change happen (Liedtka, 2018), there is little evidence that Higher Education has embraced the approach to the same extent as many other public, private and 3rd sector organisations.

Prior to the emergence of COVID-19, Higher Education was facing many challenges. Now, as we begin to return to campuses, there is a growing pressure on institutions to respond, innovate and transform in order to tackle the growing list of new and existing operational challenges, the imminent threat of disruption and to meet the explicit and unarticulated needs of its staff and students. In this article we argue that design thinking could offer an inclusive approach to innovation and transformation, one that institutions can utilise to begin to address these complex challenges, improve stagnant processes and ensure sustainability over time. Change can only happen if institutions are able to motivate, build creative confidence and give permission and support staff and students to take action. We argue that they need empower staff with the capabilities - tools, attitudes and abilities necessary to identify and tackle challenges, and move into an uncertain space where the core skills and mindsets of design thinking: empathy, humility, creativity, experimentation and a bias towards action offer the opportunity to design that change. We put forward a set of design principles that could help catalyse and support this process.

Keywords: COVID-19, Design Thinking, Higher Education; Innovation, Design principles.

1. Introduction.

"*My hope is that we can take a good hard look at our own intellectual underpinnings here and ask ourselves, "are there things that we can do differently or designs that we can produce or teaching and learning that we can alter that can help produce new and better aspirational attainment for the goals of our country?"* (Crow, 2020).

In a public response to the current COVID-19 crisis, Michael Crow, the President of Arizona State University (ASU), spoke about not just the need for change in Higher Education (HE), but the need to design that change. In his statement, he asked that all ASU schools, programs, faculty and students "*engage in a process of new ideas, new designs and new concepts*" (Crow, 2020). Importantly, Crow noted that designing change within HE would not only impact how the system functioned or delivered content, but such a change had the potential to influence a society better equipped to deal with the many challenges that lie ahead.

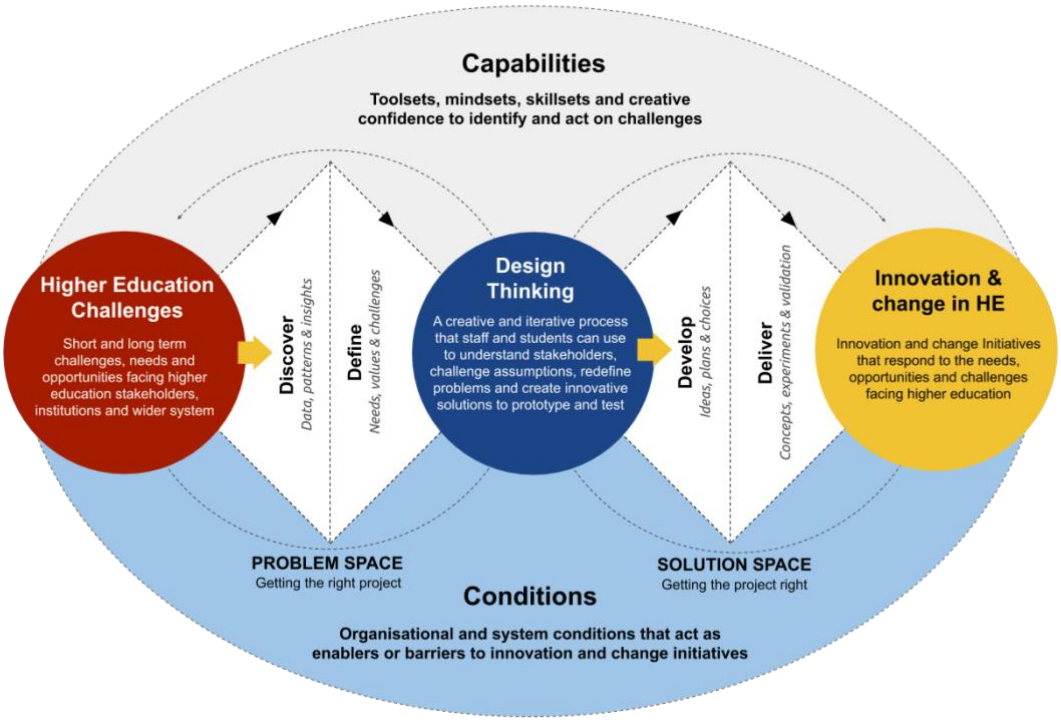
To begin our exploration into how we might go about designing change in the HE system, this article will begin by presenting some challenges created within the HE system as a direct result of COVID-19. The article will present Design Thinking as a methodology for encouraging interdisciplinary collaboration and creative problem finding and solving to address some challenges facing the system. Finally, we will present a set of design principles developed by Maynooth University Innovation Lab, which have been created to help stakeholders, at all levels, to understand and adopt the tools and mindsets of design. This article posits that design thinking holds the potential to transform practices within the HE system in a way which will not only provide a framework for tackling current challenges, but also benefit the system in terms of ensuring sustainability over time by embedding new attitudes, abilities and productive ways of working and collaborating.

Before COVID-19, HE faced many challenges, today these challenges still exist, but many more have been added, each more complex than the previous. Outside operational challenges, in recent weeks we have seen technology companies such as Google, Coursera and Lambda beginning to make serious moves into the HE space. A recent Forbes article proclaims "*Google*

Has a Plan to Disrupt the College Degree" (Bariso, 2020), online learning platform Coursera raised $130 Million at reported $2.5 Billion Valuation (Adams, 2020), and online alternative credentialing providers like Lambda, HBS and General assembly are seeing a huge surge in international learners on their platforms - in some cases a 650 percent increase (McKenzie, 2020). To take on these challenges, and for HE to survive and thrive, the traditional HE community must change, improve and adapt. Previous assumptions are no longer true and ways of working, thinking and doing will no longer be effective. We must now shift to a new way of operating, one which is more empathetic, more innovative and less reliant on what sufficed in the past. In this article, we propose that design thinking offers a new, accessible and effective approach, one which can enable the community to combine empathy and creativity to not only tackle the challenges that exist, but to get ahead of them and propose new and better ways of doing and experiencing traditional higher education.

This paper aims to address the challenge of providing stakeholders with the capabilities to innovate and bring about organisational and system change within Higher Education. The framework illustrated in figure 1 highlights the three dimensions of the study; (1) Higher Education challenges, (2) design thinking, and (3) innovation and change in Higher Education. These three areas sit within, and are dependent on the specific capabilities of stakeholders and the conditions within the organisation. The three dimensions are overlaid upon and show their relationship to the "*Double Diamond*" design process (Council, 2015), a process of two 'spaces' and four non-linear phases. The problem space sees users explore and understand the general challenges (Discover phase) and then define the specific challenge(s) to be tackled (Define phase). The solution space involves users creativity exploring of the specific challenge (Develop phase), and finally, taking focused action to build experiments, refine and validate specific solutions.

Figure 1: Framework for applying Design thinking in higher education



1.1 Challenges created within Higher Education by COVID-19.

When campuses across the globe closed as a response to COVID-19, it brought with it challenges that required flexibility on the part of academic staff, administrative staff and students alike. All were attempting to continue to work and learn in a world where restrictions on movement and social isolation became the norm. Some Higher Education Institutions (HEIs) adapted quickly in order to firefight the disruption. Courses focusing on medical training responded by fast-tracking the exams and graduation of doctors and nurses to assist on the frontline against the pandemic (Mealy, 2020). Design and engineering courses such as the product design programme in the University of Limerick turned their attention to developing Personal Protective Equipment (PPE) (Donnelly, 2020). Others focused on finishing out the final semester of the year online, where challenges and potential for future education innovations were discovered. Through our qualitative research with staff and students at Maynooth University during the height of the COVID-19 pandemic, it became evident that students struggled with productivity directly as a result of a lack of social interaction with their academic peers and others in their social group. Additionally, they worried about how they would reintegrate into college life the following semester, having been so far removed from it as a

result of the COVID-19 lockdown. Lecturers were fearful that online learning would become the "*go-to*" approach going forward, and face-to-face classes would be abandoned for cost saving and the possibility of dramatically increasing already large class sizes. Staff were working tirelessly to show that smaller group sessions had value in terms of developing a sense of camaraderie, challenging students to question content and help them become more confident in the verbal expression of their ideas.

As Healy et al. (2020) noted, the challenges facing HE as a result of COVID-19 are highly diverse in nature, ranging from student experience issues, international student intake, campus management, financial issues and staff issues. They and others note that student experience needs to be at the centre of any discussion relating to changes to ensure that students are "*co-creators*" of their own experience (Bovill et al., 2011). Many commentators highlight the serious consideration that must be given to transitioning existing courses from face-to-face delivery and adapting or reshaping them for the blended learning environment (Healy et al., 2020, Teräs et al., 2020, Green et al. 2020). Covid-19 has meant that HEI's had to quickly redesign what they had prepared in advance for the teaching semester (Green et al. 2020). They had to radically adjust their teaching environment, educational strategies, and class delivery, with a subsequent, significant effect on the students' learning experience (Hill & Fitzgerald, 2020). While many welcome the unique opportunity to develop new educational policy and practice, some worry that the urgency of the situation may lead to hasty, techno-deterministic "*panic mode*" solutions (Teräs et al., 2020). This is a concern that we also share, because at this critical time, we must ensure that we are identifying and tackling "*the right problems*" and not hastily implementing the wrong things well (Vaugh & Ryan, 2015). As we are not even a year into this pandemic, little research has been published on the true impact of COVID-19 on HE. Only time will tell if HEI's were able to rise to meet the challenges.

While the challenges are numerous, there has been positive developments in the Irish HE sector in recent years that has put Ireland in a stronger position to take them on. In 2012, the then Minister for Education and Skills, Ruairí Quinn, also spoke about the need for design. In this case he spoke about the need to redesign our HE system to assist universities in meeting the challenges which will confront them in the future (Speech by Minister for Education and Skills, Ruairí Quinn TD, on Higher Education Reform – Merrion Street, 2012). This speech saw the

introduction of two important initiatives that today place Ireland in a much stronger position to respond to recent challenges and enable change to happen. Firstly, he launched the National Forum for the Enhancement of Teaching and Learning in Higher Education, a body that is today placing important focus on the quality of teaching and learning, adaptability and the preparedness of our HEI's for change and improvement. Secondly, he prioritised the formation of regional clusters and future technological universities as a means of consolidation and collaboration, to bring opportunity, to pool expertise, concentrate resources, improve choice and enhance the quality of the student experience (Department of Education and Skills, 2018). The first of these new institutions, Technological University Dublin (TUD), was officially established in January 2019, with additional mergers coming on stream in the coming years. Finally, in recent weeks a new governmental Department of Further and Higher Education, Research, Innovation and Science was established (Donohoe, 2020), giving the sector additional funding and a strong voice through ministerial representation. These three major initiatives could not have come to fruition at a more important time in our history, as they signal the desire to move in new directions and create a solid infrastructure for that change to happen. We propose that a design approach, where design thinking forms the centre of the methodology, has the potential to become an important capability within each these initiatives and across the system as a whole, bringing new ways of thinking, operating and collaborating as we work together to create meaningful change.

2. The opportunity for design thinking in Higher Education.

Design Thinking is defined by Gruber, DeLeon, George and Thompson (2015) as a "*human-centred approach to innovation that puts the observation and discovery of often highly nuanced, even tacit, human needs right at the forefront of the innovation process*,". It is seen as "*intentional, creative and supercharged*" thinking (Costa, 2017:6). While there are many design thinking frameworks, they all focus on four key elements: deep stakeholder engagement to understanding and define the challenge; creativity to develop choice and to discover new ways of tackling challenges; engineering and business skills to build, experiment and implement solutions of value, and; engaged stakeholders, working across silos to inspire and co-create solutions into existence.

Design Thinking is now a well-respected and validated means of tackling complex challenges, such as those facing HE today (Liedtka, 2018). It is also a proven methodology for delivering innovation and positive experience outcomes across products, services and processes in a range of situations (Liedtka, 2018). A global study by PwC demonstrated that Design Thinking is now being used by almost 59% of organisations as their operating model for driving innovation (Staack and Cole, 2017). Schiedgen et. al. (2015), in a study of 181 public and private organisations in Germany, found that 71% of respondents found design thinking improved working culture and 69% found it made their innovation processes more efficient. The report also looked at the reasons for discontinuation of Design Thinking and found that only 9.8% (23 respondents) reported a discontinuation. The authors identified three themes for the failure - 1/ Design Thinking being handled as a one-off affair with no efforts for organizational embedding, 2/ lack of management support connected to insufficient resources and financial support, and 3/ failed diffusion and implementation. There is much HE can learn from the successes and failures of Design Thinking in organisations, but to date, little research has been carried out specific to the HE sector.

By way of example of the use of Design Thinking in an Irish HE context, Vaugh et al. (2018) document a large-scale design thinking project in Maynooth university (MU). They used design thinking to understand and design the transition into HE for students from underrepresented groups. This project involved MU Access office and university staff working with current and incoming access students to map the student journey into HE, carry out empathy workshops to share experiences and then design and co-create the new ‘Launchpad’ access programme. This project has now been successfully implemented and has resulted in significant time and cost savings, student satisfaction and retention gains and won a university service innovation award.

Traditionally, the focus of Design Thinking has been on creating desirable and innovative outcomes, but recently the emphasis has broadened (Liedtka, 2018) and in the HE environment, the social and collaborative aspects of the process are important additional benefits (Vaugh et al., 2018), having the potential to help build, strengthen and take advantage of HE’s diverse community. This is particularly important in today's context as we scramble to develop and

improve products, services and experiences. Co-creation is a key component of Design Thinking and becomes highly effective and is 'enhanced' when used as part of the process (Hirano et al., 2013). In co-creation, the users of a service are recognised as the "*expert of their experiences*" (Van der Lugt & Visser, 2005) and are therefore central and equal in the early stage definition, conception, design and decision-making process. Importantly, co-creation differs from other forms of innovation, as it sees the user as a true development partner; it is about the joint creation of value (Prahalad & Ramaswamy, 2004). Co-creation is recognised as bringing value to the design process by producing ideas that are more creative, more highly valued by customers and more easily implemented (Kristensson et al., 2008). A co-creation approach influences the designer to view projects from a needs perspective as opposed to a solution perspective (Vaugh & Ryan, 2015). Lackie et al. (2020) have found that engaging with others in online education can help students to develop a 'sense of community' and lead to the co-creation of knowledge. Drissi et al. (2020) suggest that involving students in the co-creation process of mental health supports, might encourage students to use them. We believe co-creation between students, staff and partners will become a critically important aspect of rebuilding HE following the COVID-19 pandemic.

While the Irish HE system has an abundance of talented and passionate individuals, it lacks the infrastructure devoted to exploring in a creative and agile way, the multitude of challenges it faces, especially in the midst of COVID-19. The first step to developing such an infrastructure involves empowering stakeholders in the system to think and act in a complementary and collaborative manner and providing them with the right tools, skills, mindset and creative confidence (Kelley & Kelley, 2012) to enable them to act. When such a structure is developed and stakeholders begin to conceptualise challenges differently, only then will it be possible to begin the process of transforming the HE system.

At this point, we feel it is necessary to state that we do not see Design Thinking as a panacea to all of the challenges facing HE, but rather, we see it as an accessible and structured approach that offers a solid, easy to follow and attractive framework with compelling supporting evidence (Liedtka, 2018). From our work in Maynooth University, we have seen first hand how the framework is embraced and reused by staff and students and how it has delivered successful engagement, alignment and results on numerous projects. Many organisations have come to

see Design Thinking as a missing capability, and in recent years have acted to correct this. Diverse organisations such as IBM, SAP, Kaiser Permanente hospital and Arizona state University (ASU) to name a few, have invested heavily in embedding and operationalising Design Thinking across their organisations. The majority of HEI's have been slow to follow, but as the pressure to change, innovate and centre of the staff and student experience mounts, we feel that now is the time to explore what the design process can offer.

3. Principles of Designing for Progress in Higher Education.

In 2018, through the Higher Education Authority's (HEA) Innovation and Transformation Fund, the Maynooth University Innovation Lab (Mi:Lab) was formed to explore ways and introduce approaches of tackling challenges faced in HE using a Design Thinking approach. Prior to COVID-19, the HE system faced challenges such as the under-representation of particular socio-economic groups within the system, attracting and retaining academic talent, developing a strategy for the recruitment and completion of lifelong learners in postgraduate taught education, the development of digital and flexible learning offerings, and designing pathways of conversion of undergraduate to postgraduate study, to name but a few. To tackle these types of challenges using Design Thinking, Mi:Lab understood that it would be necessary to design a "*habitus*" for addressing such challenges, namely: "*a subjective but not individual system of internalised structures, schemes of perception, conception, and action common to all members of the same group or class*" (Bordieu, 1977:86). Through collaboration between Mi:Lab's staff who possess expertise in design, innovation and anthropology, and HE students, lecturers and administrators, the eight Principles for Designing Progress in HE were developed. These principles are show in Figure 2 and are outlined below.

Figure 2. The Mi:Lab principle posters

Principle 1: Centre on people's needs & goals

Let empathy and genuine human understanding guide better decision-making and create meaning

Focusing on the explicit and unarticulated needs of the wide spectrum of stakeholders within the HE sector was a recurring theme which held importance for the development of all principles, but specifically Principle 1. The Design Thinking process places much weight on empathising and understanding of the human experience in order to make better decisions and create meaningful interventions. This way of working is important in HE, as it can enable deeper empathy and human understanding in a system where hierarchical decision-making is prevalent (Jones, 2012) and where the key stakeholders are often considered institutional abstractions rather than as concrete personas (Apple, 2004). The need to build mutual empathy between students, lecturers, staff and the University executive would be integral should all HE stakeholders be successfully able to collaborate on the design of interventions and identify system and process frictions, shortcomings and opportunities.

Principle 2: Be curious and open to find the patterns.

Insight comes from finding, collecting & connecting the clues that are hidden in plain sight.

The largely qualitative nature of the data collected as part of the design process through ethnographic research methods, requires an intense form of processing, allowing ideas to emerge from the data itself, rather than approaching it with preconceived agendas (Glaser and Strauss, 1967). The structured nature of the design process compliments the relatively ambiguous nature of qualitative data, with more guided forms for creating understanding, such as stakeholder, experience and empathy mapping techniques etc. In addition to these rigorous forms of data collection and analysis, we wanted to place emphasis on observing and understanding trends and patterns in the wider world and their role in informing the types of interventions developed. Innovation and improvement in a complex system like HE requires stakeholders to pay attention to subtle stakeholder needs, be curious and open to new learning and disseminate this learning through knowledge sharing activity (Sohail and Daud, 2009). By encouraging and enabling this mindset across HE stakeholders, we hope to gain from the intellectual capital within the system (Swart and Kinnie, 2003) and use it to address challenges facing HE.

Principle 3: Intellectual humility is the force for change.

Change only happens when we challenge our biases, question norms & are open to new ideas

For this principle, we identified key stakeholders within HE who drive and enable change across the university and analysed their specific character traits. We found that humility, specifically intellectual humility (McElroy et al., 2014) emerged as a core characteristic for enabling change. The concept of intellectual humility has been associated with a number of essential innovation and change characteristics, including knowledge acquisition, reflective thinking, engagement, curiosity, open-mindedness, collaborative learning and intrinsic motivation to learn (Krumrei-Mancuso et al., 2020). These characteristics are particularly important in HE, which has been described as inflexible, resistant to change and characterised by conservatism in practice, goals and culture (Lane, 2007). We believe that by engaging HE stakeholders in the process of Design Thinking, and guiding them to challenge and understand the possible frailty of their

assumptions, we can effectively begin to question the non-negotiable orthodoxies that HE is wedded to (Palmer, 2009).

Principle 4: Co-create for greater impact.

Today's challenges require diverse mindsets. Work closely with service users to build meaningful solutions

We were very aware of the 'student as co-creator' in the education experience debate (Bovill et al., 2011) when developing this principle. In addition to this, we understand from the perspective of the academic and administrative staff within the University - any innovations we propose need to be easy to use and integrate into their already demanding roles. As such, we saw it as vital to include all eventual users in the design of solutions. Although co-creation is increasingly a requirement in businesses (Binder, Brandt, & Gregory, 2008), within HE it is still an exception. This is despite the fact that through co-creation, students' knowledge and viewpoints can jointly interact with University faculty and staff to create more integrated and superior outcomes than if only one group tried to satisfy the needs of the other alone (Dollinger, Lodge and Coates, 2018). Mi:Lab positions itself as a mediator between the University, the staff and the students, facilitating productive collaboration and ensuring that the voice of each group is represented, respected and visible in our outputs.

Principle 5: Innovation happens at the boundary of disciplines.

Collaboration and exploration across silos can take us to uncharted territory full of opportunity

Understanding the structure of the University was important in the development of this principle. The more we understood how the University operated, the more we saw that collaboration across disciplines was present, but often strained and ineffective. Interdisciplinary collaboration is a key ingredient to competitive advantage where innovation is a desired outcome (Carlile, 2004), but while the need for interdisciplinary collaboration is well understood, substantial barriers to its implementation remain (Kezar, 2005). Departmental silos, bureaucratic and hierarchical administrative units, unions and other rigid structures act as barriers to cross-divisional work and partnerships (Kanter, 1994; Senge, 1990). Mi:Lab recognised these barriers and developed strategies to make the process of interdisciplinary and interdepartmental

collaboration more effective. This was particularly important in the early stages of the project as we set about proving the value of our service within the HE system. This strategy included:

1. *Careful identification of key individuals across the University with meaningful, high priority challenges, a student-centred attitude and an openness to Innovation and experimentation.*
2. *Clear demonstration of the value and rigour of Design Research, situated in theory and supported by relevant case studies and 'taster' workshops.*
3. *Provision of a number of carefully framed, relevant and well researched challenges that created a sense of urgency and importance to stakeholders.*
4. *Designing workshops to be efficient, engaging and productive and situated in an energising environment, different from a typical University space.*

This principle was developed to place emphasis on the importance of interdisciplinary innovation and to enable us to facilitate productive collaboration activity across the many diverse disciplines and functions within HE.

Principle 6: Build to think & learn by doing

Powerful thinking, learning and alignment happens when we make abstract ideas tangible, experiment and iterate

HE is predominantly a place of scientific thinking and inquiry. While design thinking thrives on ambiguity, scientific thinking regards uncertainty and ambiguity as threats to knowledge development (Duschl, 1990). Therefore, introducing Design Thinking in this environment was always going to bring challenges. Authors such as Dunne and Martin (2006) see Design Thinking as the reverse of scientific thinking, arguing that the scientist analyses facts to discover patterns and the designer invents new patterns and concepts to address facts and possibilities. Similarly, Liedtka (2000) contrasts Design Thinking with the scientific process, stating that the '*most fundamental difference is that design thinking deals primarily with what does not yet exist; while scientists deal with explaining what is*' (Liedtka, 2000). From our experience, this difference becomes less extreme during prototyping activity. According to Berglund and Leifer (2015), prototyping overrides dysfunctional communication structures and facilitates communication between people across disciplines and roles. As well as its ability to blur differences, create shared experiences and tangible collaboration, we find prototyping

throughout the entirety of the design process valuable. While iterative prototyping is essential in the design and development of products and services, we believe that it is critical to adopt this approach in the construction of diverse aspects of the HE system, from research and admission policy to departmental strategy, staff well-being, accommodation issues and student experience. Embedding a 'building to think' and 'learning by doing' mindset, ability and confidence to stakeholders within HE, could have a lasting impact on how learning is conceptualised and developed, how teaching is delivered and how system improvements are conceived, shared and implemented. Figure 3 shows a typical early prototype used to achieve support for an innovative student engagement display for the Maynooth University Postgraduate Studies Office.

Figure 3: Prototyping interactive student decision display

Principle 7: It's OK not to know. Get comfortable in the ambiguity.

Jumping to solutions too quickly means we miss out on more informed understanding, points-of-view & ideas

In a complex, busy and stressed system like HE, there is, contrary to popular belief, little time for casual exploration and reflection. The system needs to keep moving and the ever-increasing administrative duties, demands to publish and growing student numbers ensures staff are kept very busy. For this reason it can be challenging asking project participants to slow down, get

comfortable not knowing the answers and trust the design process to guide them to better questions and better answers. The scientific/analytical mindset of a typical HE academic brings another challenge. According to Kelley and Kelley (2013), "*people with strong analytical skills tend to snap instantly into problem-solving mode. They leap for the finish line and then start defending their answers*". Designers on the other hand deal with incomplete information, with the unpredictable, and with ambiguous situations and this requires them to feel comfortable with uncertainty (Pombo & Tschimmel, 2005). On reviewing a number of completed projects and through the experience of the Mi:Lab team, comfort with ambiguity was identified as vital but often an absent capability amongst many HE stakeholders. For hundreds of years the operating system of a typical University has remained relatively unchanged and predictable, meaning there was little need to ever step into the unknown. Design, innovation and change projects are by their nature, journeys into the unknown. This can be uncomfortable for those who seek firm ground or who want to progress with speed, but the changing face of HE means that, more and more, what we do and where we go from here is uncertain.

Principle 8: Communicate creatively to inspire action.

Build a shared vision & inspire action by communicating simply, creatively & with empathy.

The HE environment in which Mi:Lab operates is complex, and the nature of the projects we work on are, by their nature blurry and intangible. The conservative nature of HE (Lane, 2007) adds to the challenge of helping stakeholders conceptualise and 'buy-into' new ways of doing things. Similar to the '*Building to think*' principle, we view creative communication through visuals, experiments, presentations and cultural probes etc. as '*Building to see*' - providing a glimpse into what does not yet exist. As Poggenpohl (2002:2) states: "*Design envisions the future by taking a felt need or problem or what is a vague and often abstract idea and making it tangible - making it exist in the world so that various stakeholders in the idea can imagine together, socially and interactively, what "it" might be like*".

We have found from our experience that even the best concepts can be failed by poor communication. The inverse is also true. During our research we brought together examples of concepts which we felt communicated their message successfully and achieved a level of 'buy-in' or progressed in our development cycle. We analysed these for common traits.

Communicating simply, creativity and demonstrating human insight were the core elements. Importantly, placing the concept visually into the current context helped our audience imagine what it might look like, how it might work in reality and how it might solve their problem. Providing new knowledge in the form of creative communication seems to circumvent research which suggests that many of the difficulties associated with stirring up of employees' imagination capital can be directly related to the management of knowledge (Dobni, 2008). Building a shared vision is important when trying to change and improve a system, and this principle was introduced to allow us to place emphasis on the importance of communicating creatively and effectively across disciplines, structures and roles within the HE system and using this to inspire action.

4. Conclusion.

The emergency response to COVID-19 has impacted all areas of our lives and the society we live in. Like every other public service, HE was forced to change overnight and adapt. While the stop-gap solutions fulfilled the needs of HE to ensure that the academic semester was completed and students were able to finish their respective studies, it is now crucial that we take this opportunity to examine how to reimagine and reshape the system to better suit the needs of all stakeholders and ensure sustainability and progress going forward.

Teaching and learning were not the only aspects of HE that were affected. HE now faces a whole new web of challenges, each affecting various stakeholders in different ways. While it is valuable to develop mantras such as "*Respond, Recover, Thrive*" (Healy et al., 2020) in order to motivate stakeholders to engage in addressing the challenges, we need to think strategically about how we respond to the challenges in order to recover and thrive, but also reimagine and work together to develop 'what could be'. As we have stressed throughout this discussion, addressing the challenges created by COVID-19 will depend upon a format that is inclusive, has a proven ability to produce results and responds to the needs of all stakeholders. We see Design Thinking as the format with the greatest potential for success. In order to begin using Design Thinking to address these challenges, we first need to break down the siloed nature of HE and encourage, empower, inspire and motivate stakeholders in the system to think differently about how they identify, prioritise and approach challenges. An attitude shift is required, where focus is moved from jumping to the least worst option (Riel & Martin, 2017), to

forming a deep understanding of the intricacies of the challenges and identifying creative, human-centred ways of approaching them. We believe this attitude should be a design attitude, and this can be developed by stakeholders understanding and practising the principles of Design Thinking. While the principles developed by Mi:Lab were created prior to the COVID-19 pandemic, we feel they are more relevant and more necessary than ever before.

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