



Australian
National
University

CODESIGN CULTURE LAB 2019 SUMMARY REPORT

What will our world
be like in 2050?

ANU College of
Engineering &
Computer Science

R E I M \triangleleft G I N E



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EXECUTIVE SUMMARY

The Reimagine Project is a 15 year + agenda to rethink the disciplines of engineering and computing, and to change the way we teach, learn and engage with the complex challenges of the 21st century. The 2019 CoDesign Culture Lab brought together over 100 interested students, staff, industry professionals, community partners and overseas representatives in order to re-imagine the future of ANU's College of Engineering and Computer Science. The culmination of a year's worth of CoDesign engagements, outreach workshops and research, the 3½ day Culture Lab resulted in four key achievements:

- > Creating new partnership opportunities, within the university and with key external organisations
- > Establishing a network of 'Critical Friends' to help each other assess and improve processes and projects
- > Modelling approaches to CoDesign and collaboration
- > Designing criteria to assess future action within the Reimagine project

Participants identified eleven key principles that should be followed in the design, evaluation and implementation of the initiatives proposed under the Reimagine investment. These were:

1. fostering genuine collaboration;
2. ensuring effective communication;
3. enacting measured, sustained and genuine progress towards decolonisation, Indigenous reconciliation and equity;
4. creating conditions for creativity to flourish;
5. nourishing and maintaining a vibrant professional community;
6. fostering a strong, vibrant culture of problem-finding, collegiality and respect;
7. recognising the paramount importance of context;

8. building and sustaining links with community and industry;
9. valuing staff and students;
10. supporting and valuing diversity; and,
11. enacting social responsibility.

Participants generated bold ideas for improving equity, diversity, teaching and learning, and highlighted both the benefits and challenges of current approaches. They also created detailed design criteria for specific design challenges identified as central to the Reimagine investment. Design criteria envisaged a sustainable, socially-responsible institution which provides engaging, accessible and equitable life-long education, underpinned by valued, well-trained and well-supported teaching and professional staff.

The relationships, conversations and criteria established at the CoDesign Culture Lab will continue to generate outcomes beyond the event itself; whether through the application of design criteria in decision making and project implementation as part of the Reimagine investment, through specific collaborative projects and partnerships whose beginnings can be traced to the event, more informal peer networks established and maintained, or ideas discussed in their early stages that get further developed and tested in the future.

We are grateful to the many people who have supported, designed, or engaged with the CoDesign Culture Lab. We encourage you to read the following document in detail in order to understand the complexities and wealth of good ideas put forward to guide the future of the Reimagine project.

ACKNOWLEDGEMENTS

We give thanks to the traditional owners and custodians of the land on which we met, in Kambri in the city now known as Canberra, as well as the traditional owners and custodians of the diverse knowledges and knowledge systems which were drawn upon and shared in the CoDesign Culture Lab.

The CoDesign Culture Lab was a significant investment of time, energy and resources by the College of Engineering and Computer Science. It was an experiment in models of engagement and CoDesign, at scale and in the specific context of the ANU.

The labour, creativity and vision of a few specific people must be acknowledged, and we offer thanks to the following people:

- > Elanor Huntington
- > Isabelle Meyer
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- > Bec Hopkins
- > Rebecca Moorby
- > Louise Blessington
- > Ben Houghton
- > Sinanziwe Sibanda
- > Akshata Giri
- > Brad Riley
- > Sarah Etheridge
- > Louise Blessington

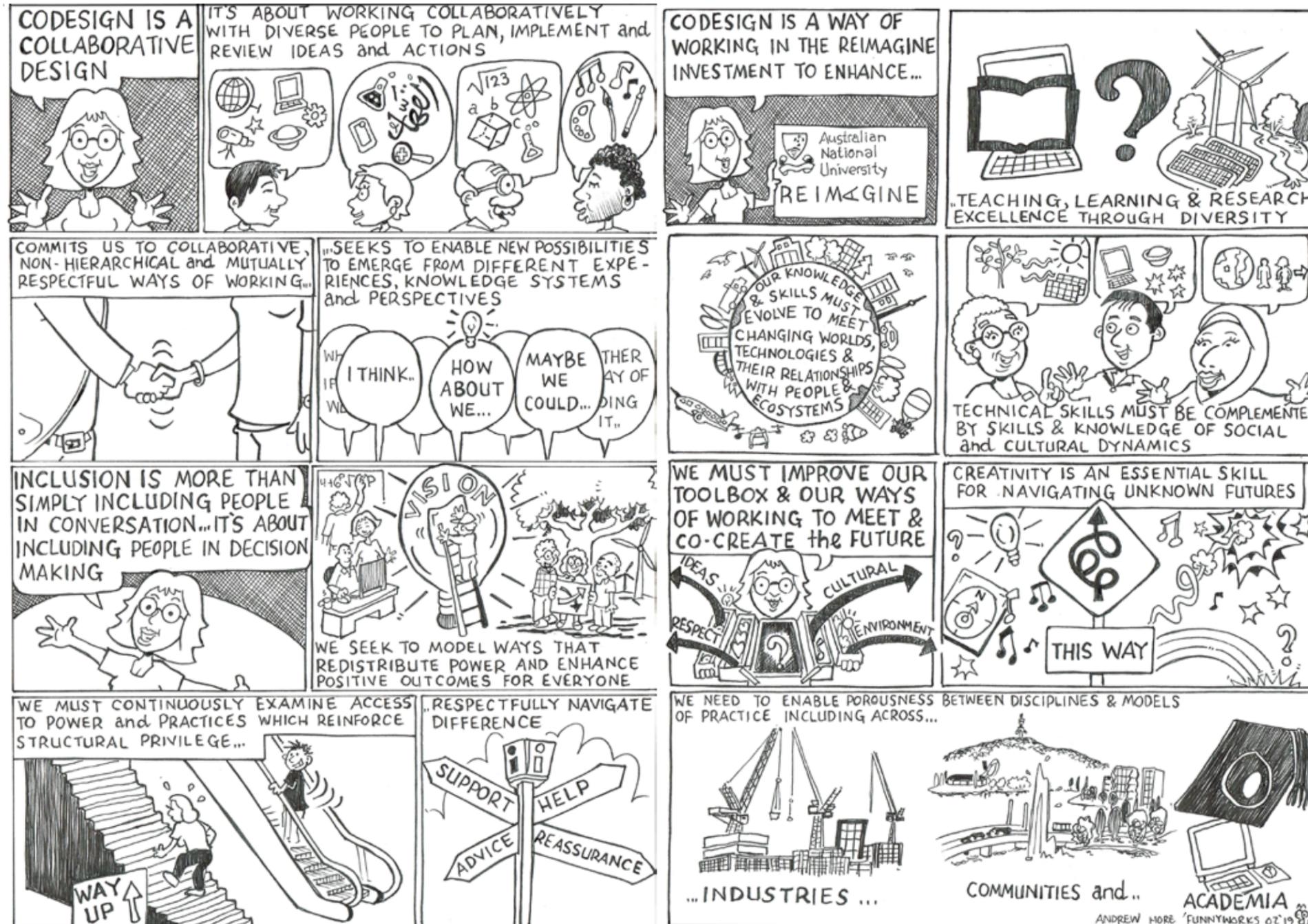


Our codesign advisory group: Jochen Trumpf, Bec Davis, Jeremy Smith, Ben Swift, Yaya Lu, Emily Gentilini, Maia Gould, Amy McLennan.

We give special thanks to all of our speakers and workshop leaders for the creativity and engagement they brought to their engagement with the event.

With thanks,
Maya Haviland & Dan Etheridge

CODESIGN AND THE REIMAGINE INVESTMENT



CoDesign means collaborative design. It's about working collaboratively with diverse people to plan, implement and review ideas and actions. It seeks to enable new possibilities and approaches to design and implementation; drawing from different experiences, knowledge systems and perspectives.

CoDesign is an approach chosen by the leadership of the ANU College of Engineering and Computer Science to enable implementation of the Reimagine investment. The Reimagine investment is a major strategic transformation and establishment of a new intellectual agenda, led by the Australian National University's College of Engineering and Computer Science. CoDesign aims to help us think about and respond to what our world will be like in 2050, when we are completely embedded in both a digital and physical environment. You can read more about the Reimagine investment and its strategic intent here (https://cecs.anu.edu.au/sites/default/files/strategic_intent_20191127.pdf).

To achieve the strategic aims of the Reimagine investment, especially those related to serving the diverse needs of future communities and industries, CECS leadership recognised that we must include diverse voices, inter-disciplinary perspectives and skills in the reimagining and redesign of CECS educational and research approaches. Through the CoDesign work stream we have sought to find and engage a range of critical friends who embody the values and approaches to practicing engineering and computer science, we believe to be essential for the next decades and beyond, and who can represent the perspectives and needs of our future users, collaborators and clients. We have sought to enable meaningful engagements between these people and CECS staff and students, through scaffolded opportunities for sharing, co-design and collaboration, which can effectively feed into the design and implementation of the Reimagine investment over the coming years.

CECS CODESIGN IN 2019

Over 2019, the College of Engineering and Computer Science undertook a suite of CoDesign activities and relationship building processes. These aimed to engage diverse groups in identifying and articulating priority design challenges, criteria and projects which the Reimagine investment should tackle, and to develop a robust network of critical friends to work with us going forward. The core goal shaping our approach in 2019, was to help prepare the College to design approaches to education and collaboration fit for the middle of the century; drawing in new ideas, people and initiatives, and, critically examining existing assumptions, methods and experiences.

Our approach to developing and implementing CoDesign in 2019, used an action research methodology. We established core principles to guide our work (illustrated in the graphic about CoDesign on previous page), and used iterative cycles of observation, planning, action and reflection within our team in order to design and implement a program of work across the year.

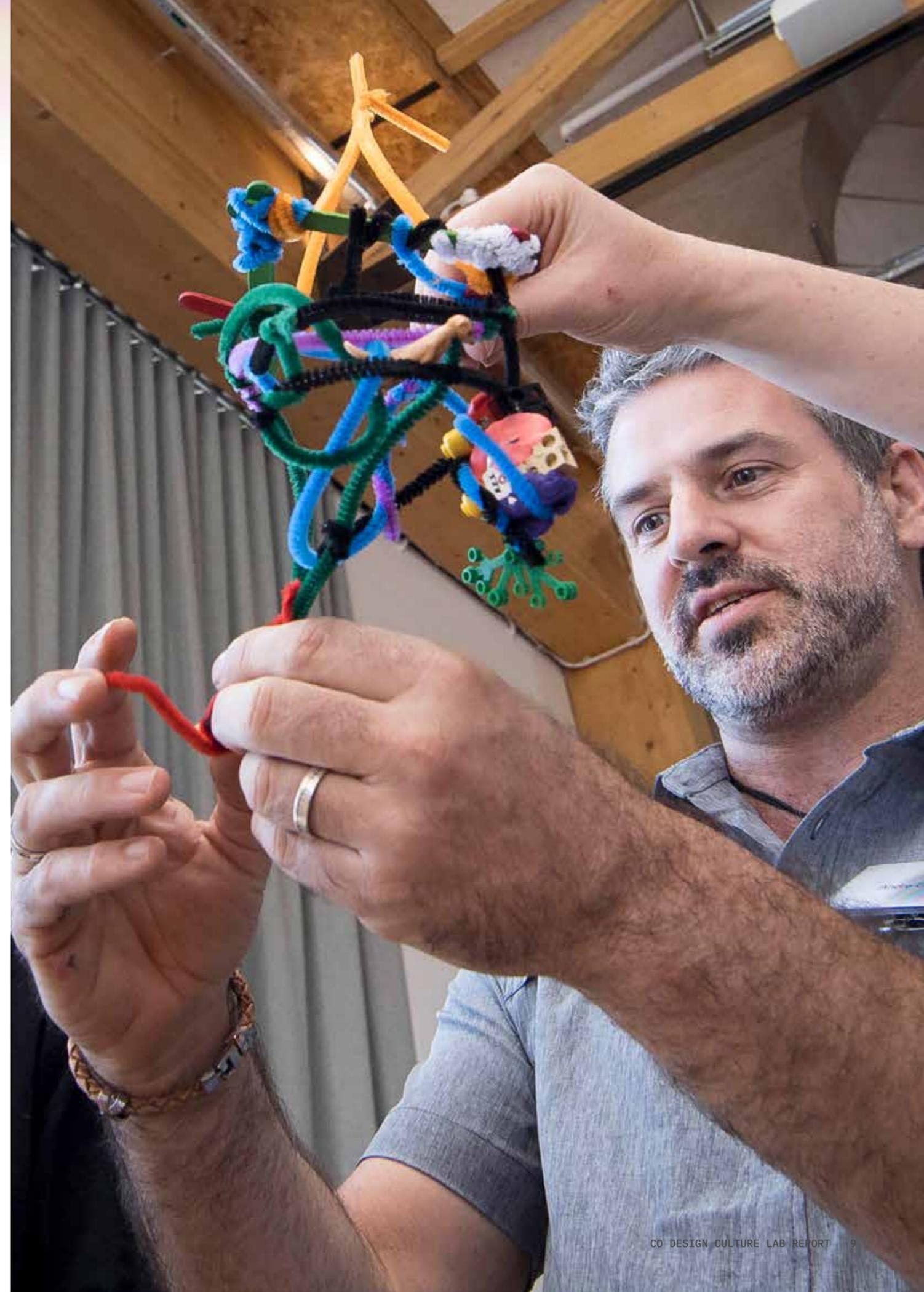
Early in 2019, we formed a Codesign Advisory Group to act as critical friends to the CECS CoDesign team as we designed and implemented our work. This group was made up of academics, students and professional staff in CECS and the broader ANU, alumni and people working in industry. They advised us on people to reach out to, issues to consider, and acted as a sounding board and feedback loop for ideas and activities under development. We also worked closely with people across different areas of the college to shape and implement our program of work; including members of the college executive, the Program Management Office, staff in the 2 existing schools and 3

Innovation institutes, the Associate Deans of Diversity & Inclusion and Education, and the CECS Marketing team.

CoDesign activities across 2019 included:

- > 3 Industry CoDesign Workshops held between April and June 2019 in Canberra, Sydney and Melbourne
- > 2 Education CoDesign Workshops with CECS staff held in June and August 2019
- > Supporting the establishment of the Reimagine Fellows initiative, supporting fellowships for CECS staff to develop and implement targeted projects in support of the Reimagine investment
- > Small group events with potential critical friends networks, where we focussed on specific topics, such as an event with Indigitek and their network in Sydney in August 2019
- > Networking with a wide range of external groups and individuals

To inform CoDesign activities, we also sought to gather existing information about the current state of the College, with a particular focus on diversity and inclusion demographics and dynamics, and the experience of students across the college and its programs.



THE CODESIGN CULTURE LAB APPROACH

The CoDesign Culture Lab was the focal point of CoDesign activities in 2019, designed to draw together the range of people we had engaged with, insights from activities that occurred across the year, and to create opportunities for the next stages of collaborative action in the Reimagine investment. In addition to being an opportunity to share learning and collaboratively explore ideas, we intended the Culture Lab to be a major step in the ongoing process of building and maintaining a network of critical friends who will inspire and provoke us, keep us active and accountable.

Specific goals of the CoDesign Culture Lab were to:

1. Build relationships between key thought leaders and practitioners, critical friends across the ANU, and the broader community with CECS staff and students
2. Provoke and workshop ideas for educational innovation in the overlapping spaces of engineering, computer science, design and creativity, drawing on priorities identified across 2019 CoDesign processes
3. Model some ways of working collaboratively and creatively across disciplinary, hierarchical and cultural differences, and at scale appropriate for the College of Engineering and Computer Science at ANU and the Reimagine investment
4. Lay foundations, design criteria and principles for collaborative initiatives, partnerships and co-design activities in 2020 and beyond.
5. Develop media and communications content to diversify the public voices and conversations about the Reimagine investment, and its broader themes and agendas

The overarching methodology used in designing and running the CoDesign Culture Lab, drew on some proven approaches to supporting

creative and collaborative engagements, and exchange between diverse people in the education, community development and cultural sectors. We specifically acknowledge our debt to the approaches to collaboration and education, modelled by the Design Futures Student Leadership Forum (<http://www.designfuturesforum.org/>), and Culture Lab principles and methodologies developed, and generously made available, by the Smithsonian Asian Pacific American Center (<https://smithsonianapa.org/culturelab/>). Whilst we did not implement these models directly, we drew inspiration from the social technologies, forms and principles developed in these initiatives and adapted them; based on learning from ongoing action research, to the context of the ANU and CECS, and the goals of the Reimagine investment. We also drew on principles of participatory action learning, design thinking, community development and play-based learning in how workshops and activities were designed and run within the event.

The CoDesign Culture Lab was held at the Kambri Precinct at the Australian National University in Canberra, Australia, from November 26-29th



2019. Over the three and a half days of the event we explored the diverse and far reaching strands of our work, and laid foundations to enable the College to begin to prototype new approaches to teaching and learning. The formats included lightning talks of 10-15 minutes by invited speakers, small group workshops run by invited leaders and ANU staff, and CoDesign workshops involving all participants. In between we shared meals and refreshments, listened to music made by some of our ANU students and spent time talking together, informally.

We did this with a diverse group of participants, including undergraduate and post-graduate students, research and teaching faculty from across CECS, faculty from multiple other Colleges across ANU, and staff representing a broad range of units within CECS. Also included as participants were invited partners from the private sector, representing firms with large global reach through to new small scale 'start-ups', individuals from the NGO/not-for-profit sector, and representatives from the public sector. We consciously sought to keep the numbers of participants relatively small, with a target of between 70-80 participants moving through the whole CoDesign Culture Lab event. ANU students and staff were selected primarily through an expression of interest process, as well as targeted invitations. Over the course of the entire Culture Lab, we had over 150 attendees, with many participating in the entire event.



CODESIGN CULTURE LAB OUTCOMES

This report distils the huge amount of collaborative discourse and idea generation (including the improv theatre performances!) that occurred at the Culture Lab, into summaries that capture the core concepts, common and repeated themes from throughout the week.

As you read through the report, you will be able to drill down into the themes of specific discussions had during the event, and engage with the ideas and criteria generated to guide future action. These themes were largely synthesised by participants in workshops during the Culture Lab. The following section “Common themes and principles emerging from CoDesign Culture Lab”, presents a summary of common themes across the whole event, and was synthesised through analysing all the material documented across the event.

Behind the content of this report, lies the raw material captured during the CoDesign Culture Lab. We prioritised the capture of as much data as we could, as we organised the Culture Lab, so we could maximise the benefits and comprehensively share the content of the event with the broader CECS community. We worked with photographers, videographers, graphic scribes, regular scribes and even a podcast producer, to ensure that the gathering of minds, energy and enthusiasm was thoroughly documented, and able to provide a strong foundation for the work to come as we reimagine the College.

The raw material from the Culture Lab, and the outcomes from other CoDesign activities, has been organised and collated, and is available for future reference for those interested in discussions related to specific issues or design challenges posed throughout the week of the CoDesign Culture Lab. In addition to producing this report, we are producing a multi episode

podcast featuring ideas and voices from the CoDesign Culture Lab. Along with video of the public talks given at the event, the podcast series will be released during 2020, enabling those who attended, and those who did not, to hear some of the voices, ideas and provocations put forward in the event.

All this documentation is important as it honours the work done by those who generously offered their time and expertise at the Culture Lab, and previous CoDesign activities. It also allows us to extend the reach of the work and discussions that occurred in the event to those who were unable to attend, but who want to engage in processes of CoDesigning the future at CECS. Drawing on this material and some of the approaches to engaging people in processes of CoDesign, we hope that the Reimagine investment will continue to provide opportunities for diverse people to shape and refine the path forward, and to participate in programming that explores what our future teaching, learning and research community might look and feel like as we move towards 2050.



COMMON THEMES AND PRINCIPLES EMERGING FROM CODESIGN CULTURE LAB

This report documents all of the sessions that made up the CoDesign Culture Lab. Each session in the event had a specific purpose and its own outcomes, and these are covered in the following pages. It is possible, however, to distill some common themes that were referred to repeatedly throughout the event. These themes can provide a set of principles to orient by, and assess against, on the journey to transform the way we teach and practice across the disciplines of engineering and computer science. These common themes are the best place to start to learn about the collective work done at the CoDesign Culture Lab 2019.

To achieve stated visions and goals the Reimagine investment should/must:

Foster genuine collaboration –

- > between staff and students,
- > with industry as appropriate, and,
- > with government, community partners and overseas institutions.

Ensure effective communication...

- > ... in and between ANU communities, students and faculty to promote collaboration and teaching and research excellence;
- > with industry, about opportunities and expectations;
- > ... to the public, about what the university does and courses actually contain; and,
- > through maintaining an accessible database of current research, industry collaborations and professional staff expertise.

Enact measured, sustained and genuine progress towards decolonisation, Indigenous reconciliation and equity.

Create conditions for creativity to flourish, through...

- > ... an encouraging, collaborative social environment;
- > ... assessment and course structures which allow for failure to be a learning tool;
- > ... small, innovative institutes.

Nourish and maintain a vibrant professional community, where...

- > ... collaboration and collegiality are encouraged;
- > ... communities of practice are nurtured within small, transdisciplinary institutes;
- > ... strong links are built and sustained with other ANU communities;
- > ... genuine, not only transactional, relationships exist with the wider community;
- > ... there is a strong sense of social responsibility.

Foster a strong, vibrant culture of problem-finding, collegiality and respect...

- > ...through embracing and encouraging diversity of people and thoughts, and valuing diverse contributions; in which everyone is committed to understanding the history of a community and its problems before trying to fix them

Build and sustain links with community and industry

- > to ensure that students and staff understand the varying contexts in which they work and learn, and avoiding repeating mistakes by understanding the context of a problem before trying to fix it.

Value staff and students, including:

- > recognising students as capable researchers in their own right who, with sufficient support, can make significant contributions to global knowledge;
- > valuing the contribution of all staff, including through better promotion pathways for teaching-oriented academics, and support, training, good employment

conditions and recognition for tutors, and recognition and celebration of professional and technical staff.

Support and value diversity of ...

- > people,
- > ideas,
- > problems and ways of solving them,
- > skills,
- > learning styles,
- > pathways to entry and exit (including life-long learning).

Enact social responsibility to the local and wider community, including sustainability as an underpinning value.





CODESIGN CULTURE LAB PROGRAM

https://cecs.anu.edu.au/sites/default/files/culture_lab_web_document_10291126.pdf

TUESDAY 26 NOVEMBER

CREATIVITY AND COLLABORATION SUMMIT

Case Studies in Creativity and Collaboration

- > Genevieve Bell
Director 3A Institute, ANU
- > Angie Abdilla
Founder and CEO, Old Ways, New
- > Peter Worthy
Social Robotics Lab, University of Queensland
- > Anna Madeline
Mixed media artist, Lecturer, School of Art and Design, ANU
- > Callie Scott-Doyle
Role Playing consultant with the Cyber Institute
- > Fiona Beck
Senior Lecturer & Convenor Hydrogen Fuels Project, Energy Change Institute & College of Engineering and Computer Science ANU
- > Mitchell Whitelaw
Associate Professor, School of Art and Design, ANU
- > Andrew Lamb
Innovation Lead - Global, Field Ready

WEDNESDAY 27 NOVEMBER

CREATIVITY AND COLLABORATION SUMMIT

Doing things differently Workshops from leaders in the field

- > Creating Social Impact & Supporting Sustainable Development
Sam Perkins and Alison Stoakley, Engineers Without Borders Australia
- > Bold Moves for Gender Parity by 2030
Dr. Francesca Maclean and Emily Gentilini, Co-founders Fifty50
- > How to appropriate technology for Indigenous homelands
Andre Grant and Peter Renehan, Center for Appropriate Technology
- > Speculative Futures informing the design of interactive systems
Ben Matthews and Peter Worthy, The University of Queensland, School of ITEE
- > Encouraging Emergence in Emergencies – how engineers who embrace complexity save lives
Andrew Lamb, Field Ready
- > Role Play Game Play Test “Logic Error Detected”
Callie Doyle-Scott
- > Collaborating with Country
Angie Abdilla and Keir Winesmith, Old Ways, New

Enabling Collaboration and Creativity Workshop

THURSDAY 28 NOVEMBER

CODESIGN WITH REIMAGINE FELLOWS

Reimagine Fellows Exploration Workshops

- > Working together to deliver teaching excellence
Neil Kaines
- > Code/creativity/culture curriculum
design workshop
Ben Swift
- > Toolkit for CECS Academics
Lori Sciusco
- > Designing the future of environmental
engineering at the ANU
Wojciech Lipinski
- > Lead from where you are: Leadership
development for Higher Degree by
Research students
Cathy Ayres
- > Shared Connections -- Creating an Engineering
Positive Impact (E+i) Hub at the ANU
Jeremy Smith

Innovation in teaching and learning: Reflections and Provocations from leaders in the field

- > **Arlindo Silva**
Associate Professor, Singapore University of
Technology and Design
- > **Celeste Carnegie**
Girl Geek Academy
- > **Cameron Tonkinwise**
Professor of Design Studies, Director, Design
Innovation Research Centre, University of
Technology Sydney
- > **Abel Nyamapfene**
Programme Director MSc Engineering &
Education, Principal Teaching Fellow (Integrated
Engineering Programme), University College
London
- > **Kathi Fisler**
Professor (Research) and Associate Director of
Undergraduate Students, Brown University Dept
of Computer Science

- > **Shriram Krishnamurthi**
Professor of Computer Science, Brown University
Dept of Computer Science
- > **Jochen Trumpf**
Associate Professor, Director Software Institute,
ANU College of Engineering and Computer Science
- > **Euan Lindsay**
Director, Charles Sturt University Engineering
Foundation, Professor of Engineering
- > **Karl Kane**
Senior Lecturer, Design, Director,
Design+Democracy Project, School of Design,
Massey University
- > **Lesley Seebeck**
Chief Executive Officer, Cyber Institute, ANU
College of Engineering and Computer Science

FRIDAY 29 NOVEMBER

EDUCATION LAB

Education Design Challenges

Full day workshop to explore key challenges in education fit for the middle of the century. Small groups workshopped 10 educational design challenges and co-designed design criteria to help guide where we want to go and how we can get there

- > Design Challenge #1
- > Design Challenge #2
- > Design Challenge #3
- > Design Challenge #4
- > Design Challenge #5
- > Design Challenge #6
- > Design Challenge #7
- > Design Challenge #8
- > Design Challenge #9
- > Design Challenge #10

CREATIVITY AND COLLABORATION SUMMIT

One of the underpinning ideas of the Reimagine investment is that we can't deploy methods and techniques of the past and expect new outcomes for the future. We reimagine problem framing and solving, incorporate diverse voices and approaches, and work together now to ensure our future leaders and communities are prepared for the work to come. To do this, it is critical that the Reimagine investment, and the work of the University going forward, enables and applies creativity as a core capability of staff and students, and enables collaboration at varying scales across differences, be they disciplinary, positional, political or cultural.

To further this agenda, the first part of the CoDesign Culture Lab focussed on modelling and exploring what applying and enabling creativity and collaboration looks like, and takes in practice. We invited a range of practitioners and researchers, who are enacting the skills of collaboration and creativity in relation to the disciplines of engineering and computer science, to speak and design interactive workshops. We asked presenters and workshop

leaders to provoke thinking, and impart tangible skills and insights about what enables creativity and collaboration in their work and practice. We then came together as a large group to workshop the factors that enable creativity and collaboration, especially in the context of a university.

The goals of the Creativity and Collaboration summit were to:

- > provoke new thinking and inspire cross-fertilisation about creativity and collaboration as core capabilities across disciplines and contexts of practice
- > draw on the breadth and depth of knowledge of all Culture Lab participants to draw out insights about enabling creativity and collaboration in diverse organisational and disciplinary contexts
- > articulate enablers of creativity and collaboration to guide action by the university going forward



CASE STUDIES IN CREATIVITY AND COLLABORATION

In this introductory session for the Culture Lab, researchers and practitioners, invited from within and beyond our ANU community, shared their work exploring creativity and collaboration in practices related to technology, design, education and future oriented problem solving in a series of short talks. We specifically asked them to go beyond sharing the work itself and to share the reasons why they do what they do and, in particular, how they rely on creativity and collaboration to get their work done.



ELANOR HUNTINGTON

Dean, College of Engineering and Computer Science
Introduction

GENEVIEVE BELL

Director, 3A Institute, ANU



ANGIE ABDILLA

Founder and CEO, Old Ways, New



PETER WORTHY

Social Robotics Lab, University of Queensland



ANNA MADELEINE RAUPACH

Mixed media artist, Lecturer, School of Art and Design, ANU



CALLIE DOYLE-SCOTT

Role Playing consultant with the Cyber Institute

FIONA BECK

Senior Lecturer & Convenor Hydrogen Fuels Project, Energy Change Institute and College of Engineering and Computer Science ANU



MITCHELL WHITELAW

Associate Professor, School of Art and Design, ANU

ANDREW LAMB

Innovation Lead - Global, Field Ready



DOING THINGS DIFFERENTLY: WORKSHOPS FROM LEADERS IN THE FIELD

Designed to engage small groups in deep exploration of new models of practice, the goal of these workshops was to collectively explore the technical, ethical, and logistical challenges of the multi-dimensional problems our work addresses and creates. These are the kinds of complex challenges graduates of engineering, computer science and design related fields must navigate, and within which, find ways to succeed.

Each of these workshops addressed issues of great relevance to our own work in the teaching of, and research within, engineering and computer science. They also provoked many questions we must consider as we undertake

the organizational change work demanded by the Reimagine investment.

Attendance in these sessions was limited to 80 participants and, therefore, required pre-registration through an 'expression of interest' process.



CREATING SOCIAL IMPACT & SUPPORTING SUSTAINABLE DEVELOPMENT

Sam Perkins and Alison Stoakley, Engineers Without Borders Australia



This facilitated workshop explored how ANU's reimagined College of Engineering and Computer Science could actively and effectively contribute to the sustainable development agenda, and in doing so, ensure that no-one is left behind.

OUTCOMES

- > **Vision of a sustainable world:** equitable; healthy environment and people; respectful; balanced; diverse; resilient; and with an economy that works for wellbeing
- > **Research:** take a systems approach to research; create a research school for environmental and energy engineering; and promote and provide research assistance for undergraduate research
- > **Enablers:** active communication and deep listening; collaboration; shared values of creating positive impact and social change; critical thinking and understanding context; learning through failure; interdisciplinarity;

inclusivity (including good, well-implemented disability policy); challenging experiences; and respect and agency

- > **Course structure and curriculum:** collaboration and co-production between staff and students, including problem-based learning, case studies and centre for synthesis; teaching students how to ask questions and think about problems; integrated ethics education; encourage engagement with industry, alumni, NGOs (e.g. Engineers without Borders), the community and other colleges; compulsory courses in governance; co-teaching and co-design; contextualised course activities; and encouraging double degrees
- > **Leadership and influence:** use sustainable strategic investments; utilise systems thinking; have researchers influence funding allocations and research foci; embrace complexity; and show a willingness to fail

BOLD MOVES FOR GENDER PARITY BY 2030

Dr. Francesca Maclean and Emily Gentilini, Co-founders Fifty50

Engineers and computer scientists of the future will have an inclusive mindset to design a future that is accessible for all. Reimagining CECS teaching and learning is an exciting opportunity to create gender equitable and inclusive practices that will form the next generation of world shapers. Participants shared their first-hand experience as CECS students and industry professionals, combined with best practice inclusion knowledge, to generate transformative interventions to reach gender parity in CECS by 2030.

OUTCOMES

> **Entry:** encourage and support a wider diversity of applicants; remove maths prerequisite and/or have free bridging courses; use alternative/complementary entry processes such as interviews to create a structured ecosystem cohort; and change how engineering is portrayed (e.g. emphasise humanitarian engineering, engineering as problem-solving)

- > **Safe space:** compulsory diversity and inclusion training; public accountability/reporting of gender in CECS; and active ANU allies
- > **Culture:** normalise women working everywhere (teaching, on panels, in decision-making roles); actively identify good female tutors for working in coming years; and have more female role models (from academia and industry)
- > **Ideas:** remember to consider gender, not sex; start with concepts, not with maths; cadetships with industry partners; an all-women flagship cohort; and appointing only women as academics until 50% ratio achieved



HOW TO APPROPRIATE TECHNOLOGY FOR INDIGENOUS HOMELANDS

Andre Grant and Peter Renehan, Center for Appropriate Technology



A co-design collaborative process explored the concept and criteria for determining what is Appropriate Technology in an Australian Indigenous context, while also exploring the technical challenges of remote Indigenous homelands and how they might 'appropriate' technology for their own ends.



OUTCOMES

- > **Design principles:** think locally, act universally; value process and outcome; genuine consultation and co-design; and work for environment and Country
- > **Solutions:** must be sustainable (both materials and maintainability by the community); holistic; be co-designed for the user; be culturally-acceptable and wanted by the community; and be accessible, affordable, durable, reliable, and easy to use
- > **Co-design and co-creation:** communication; engaging with community and building relationships; collective tinkering; creativity; creating a safe space for (inevitable) failure; and acknowledging Country



SPECULATIVE FUTURES INFORMING THE DESIGN OF INTERACTIVE SYSTEMS

Ben Matthews and Peter Worthy, The University of Queensland, School of ITEE



The aim of this workshop was to provide an example of using an approach informed by design thinking philosophies to act as a lens on the world, allowing us to see the power and possibilities of design to effect change. Four design tools were used to provide insight into this power of design: identifying the politics of human made things, that the design of these things can include, exclude, empower, marginalise, normalise or ostracise; understanding perspectives through frame analysis; speculating on the consequences of design decisions by considering how those designs might impact on extreme characters and in fringe scenarios; and, identifying values embedded in perspectives and things through the creation of value fictions around existing technologies.

ACTIVITY 1: IDENTIFYING THE POLITICS OF ORDINARY THINGS

In this activity, we considered everyday things such as automatic doors, siri, elevators and snapchat. The first task, after selecting an artefact, was to identify at least 3 attributes, qualities, resources, abilities, or infrastructure a person needed to possess in order to benefit from that artefact. The second, was to then consider who might be excluded from receiving benefit due to not possessing those attributes.

ACTIVITY 2: UNDERSTANDING PERSPECTIVES THROUGH FRAME ANALYSIS

A situation can be positioned in alternative perspectives, thereby shifting the focus or the position of stakeholders. Is it a housing shortage

or overpopulation? By using a series of analytic questions such as “What is made to seem normal?” and “Who appears to have agency or free choice?” participants were asked to identify the perspectives of people’s expressions of problematic situations.

ACTIVITY 3: EXTREME CHARACTERS AND FRINGE SCENARIOS

Through the consideration of people and situations that are outside of “the norm”, we sought to identify the social consequences of products and technologies that we design and develop.

ACTIVITY 4: DESIGN FICTIONS

Design fictions focus on values and the values that are embedded within the technologies that we

design. By identifying values, and then designing either to prioritise those values or their opposite, we explored the possibilities of the future that could eventuate from the technologies we design and develop often alternative social orders. In this activity, participants sought to create speculative scenarios for a surveillance or data sharing society. A set of cards were used to provide provocations and areas of focus. Participants randomly selected a character card, a value card and a data control card. Then they imagined a situation where the character required the data control described and, purposefully or not, fulfilled the value on the value card. An example might be a 50 year old with early onset dementia, the value of certainty, and that all data has an expiry date as a data control.

WHAT WAS ALL THIS FOR?

These activities asked people to deeply consider the decisions that they may make in the design of technology. As we (and our students) start working on technologies, it is important that they think critically about the potential impacts of the decisions that they make. They need to step beyond their own experiences and understandings, and to look beyond their perceptions of what is the “norm”. Participants in the workshop saw that design thinking and design methods can be used, not only as a tool to support product development, but also provide a lens to support critical analysis and an openness to different perspectives.



ENCOURAGING EMERGENCE IN EMERGENCIES – HOW ENGINEERS WHO EMBRACE COMPLEXITY SAVE LIVES

Andrew Lamb, Field Ready



This workshop introduced the transformational work of the humanitarian engineers, innovators and relief workers at Field Ready, and gave a sense of what disaster relief might look like in 2050. It 'briefly introduced complexity theory, and its relevance to the training of engineers and the nature of the challenges they'll need to work on - particularly disaster relief.' The workshop also explored the mindsets in action in emergencies.

ROLE PLAY GAME PLAY TEST "LOGIC ERROR DETECTED"

Callie Doyle-Scott

"Greetings, and welcome to the All-Life Rehabilitation Centre. I am MICA, the Massively Intelligent Calculating Automaton in charge of operations. I look forward to learning from you."

In this three-hour collaborative storytelling experience, participants were called in to help train MICA, a revolutionary AI, to solve problems and react to unexpected scenarios. All they had to do was answer her questions and provide guidance when she required it. It should have been a simple task. After all, computers can only do what they are told.

The workshop (held twice during the Culture Lab) was a playtest undertaken as part of the development of the 'Logic Error Detected' role play game, which has been commissioned to form part of the new Cyber Mastery degree under development by the ANU Cyber Institute. Learnings from playtests at the Culture Lab have been integrated into the further development of the game for its educational application.



COLLABORATING WITH COUNTRY

Angie Abdilla and Keir Winesmith, Old Ways, New



How can local Indigenous Knowledge Systems be harnessed to inform new approaches to engineering and computer sciences in order to create a better world?

The Collaborating with Country workshop was based on the following key themes and objectives:

- > Situating ideas and outputs in the built environment
- > Working/collaborating/thinking “across the creek” as a design provocation
- > Decentering individual attendees, instead to centre on Country
- > To create a tangible learning experience for the attendees
- > Be a catalyst moment for future change

The workshop itself had the following elements:

- > Provide context for participants
- > Explain Indigenous Cultural and Intellectual Property (ICIP) rights, as well as how and when they should be used
- > Give a brief summary of outcomes from October workshop

- > Activity: Meditation on Country
- > Activity: Design systems, spaces and experiences would you create for this (optimistic) future physical, conceptual and collaborative staff and student environment?
- > Activity (group): Describe how you (as an engineer, computer scientist, designer, researcher, professional staff or student) can collaborate with Country?
- > Activity (group): Building on today’s exploration, describe what new strategies, systems and protocols can you imagine?

The three hour workshop produced a lot of conversation, ideas and sketches regarding possible interventions, process or practice changes, stand-alone projects, new collaborations, and improvements/additions to the build environment on campus. We grouped these ideas into 3 themes:

- > Designing Across the Creek, the Campus, the City and the Continent
- > Embedding and Celebrating Ngunnawal Culture, Engineering and Language



- > New Spaces that Support New Ways of Collaborating, Working and Learning

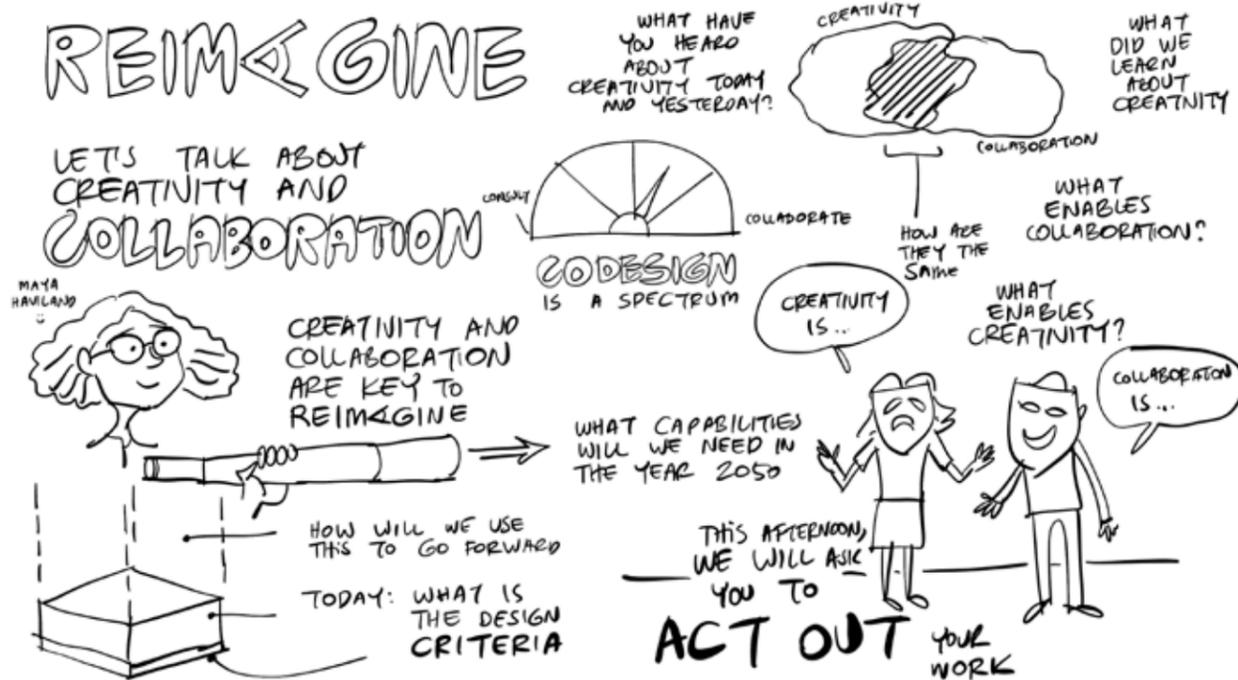
We then amalgamated and extended these ideas to select 5 that could be prototyped. The next step after the workshop is to test those ideas with key community members, to understand which are suitable for Ngunnawal Country, the ANU and the Reimagine project.

Please note: In preparation for the workshop at the Culture Lab, under the guidance of Canberra based elder Aunty Tjanara Goreng Goreng, Old Ways, New staff spoke with Dean Elanor Huntington, Reimagine coordinators Maya Haviland and Dan Etheridge and members of the local Indigenous community. Old Ways, New also held a contextual workshop with CECS professional, support and academic staff in October 2019.



ENABLING COLLABORATION AND CREATIVITY WORKSHOP

This two hour workshop brought all the participants in the Culture Lab together for the first time, with the aim of synthesising insights about what enables creativity and collaboration, drawing from the presentations and workshops from the previous sessions and the diverse perspectives and experiences of participants. All Culture Lab participants, including speakers and workshop leaders, were asked to work in pairs and small groups to reflect on what they had heard and learned about creativity and collaboration, both in the Culture Lab and in their own lives and practices. We then worked together to articulate what enables creativity and collaboration in the context of the University, performing small role plays to illustrate enabling factors.





WORKSHOP OUTCOMES

What enables Collaboration?

Participants identified many different factors that could aid collaboration, but some were repeatedly highlighted across the different groups.

The key factors were:

- > shared vision, goals and values;
- > necessity, i.e. collaboration is essential for success in a given context;
- > collaboration being incentivised, rewarded and valued

Other important factors included:

- > diversity;
- > empathy,
- > respect and a good attitude;
- > clear communication and creating shared understanding;
- > time;
- > trust;
- > people skills;
- > shared/complementary skills and passions.

These were further underpinned by a supportive and inclusive culture that engages with all stakeholders, suitable physical infrastructure and robust institutional support.

What enables Creativity?

Participants identified many factors that could aid creativity, but the key themes were more clearly clustered into 5 stand-out criteria:

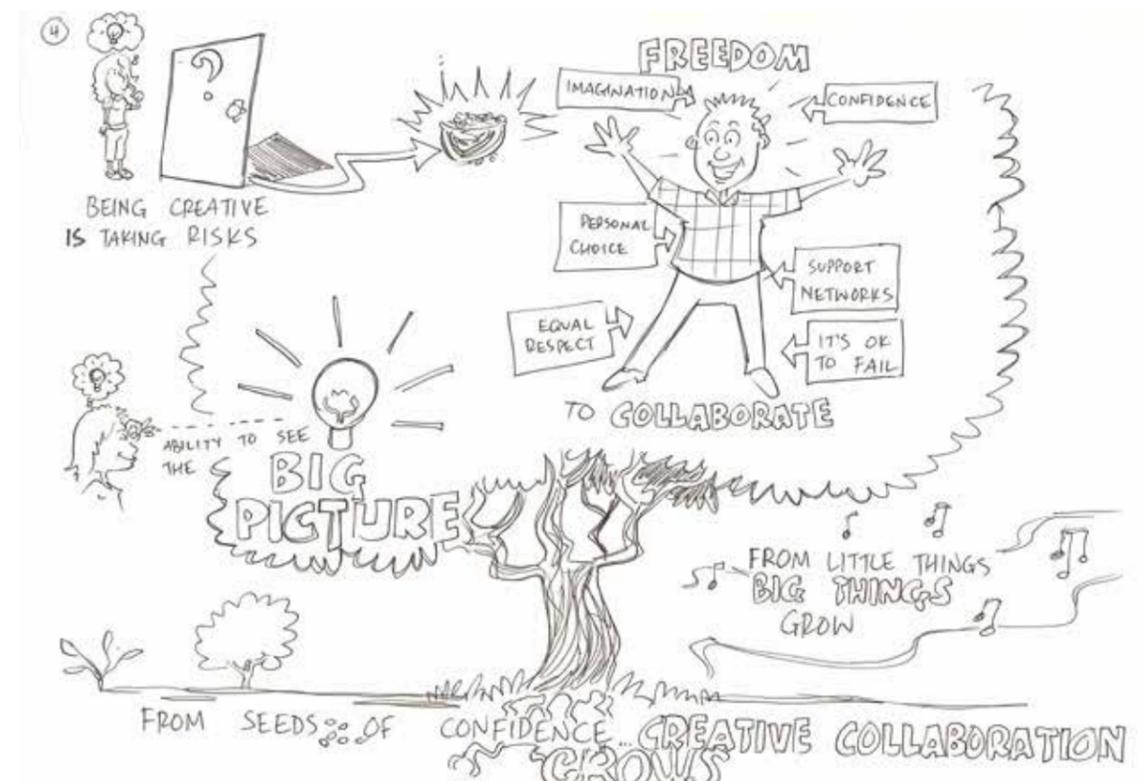
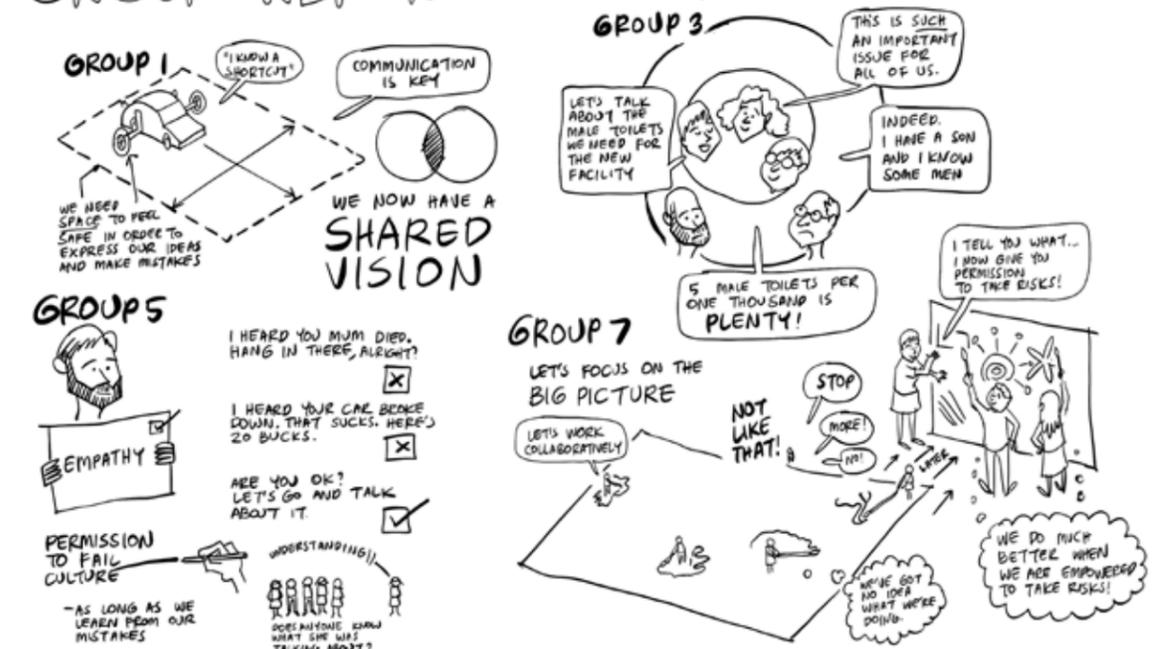
- > safe space;
- > time;
- > pushing boundaries;
- > diversity;
- > acceptance of risk and failure

Other important factors included:

- > personal motivation to gain new/different skills and perspectives;
- > freedom/autonomy;
- > suitable physical infrastructure;
- > headspace;
- > respectful disagreement and dialogue;
- > supportive performance metrics.

This was underpinned by leadership and culture that values creativity, as well as access to resources.

GROUP REPORT OUT - SKITS



REIMAGINE FELLOWS EXPLORATION WORKSHOPS

The Reimagine Fellows are a cohort of visionary academics and staff in CECS who are embarking on projects that reflect CECS' vision for the future. The fellows were invited to prepare workshops for presentation at the Culture Lab, as a way to further explore their specific areas of investigation, and to do so while capitalising on the combined wealth of knowledge and experience in the room at the Culture Lab.

Here, we describe the workshops and give brief summaries on the outcomes of each workshop. These outcomes constitute important data for further reflection and incorporation into the development of each Reimagine Fellow project.



WORKING TOGETHER TO DELIVER TEACHING EXCELLENCE

Neil Kaines



Are you interested in student labs and projects? The technical services team are, and we're re-shaping the way we support these activities so your input will influence the way we work in future.

We asked questions such as:

- > **Convenors;** from when you first get an idea for a new lab or student project to when the students are handing in their results, what support would smooth the way?
- > **Students;** from when you sign up to a course with practical content until you finalise your reports or complete your build, what support would you appreciate having?
- > **Tutors;** before, during and after supporting a lab, what assistance from professional staff would be useful for you in delivering the best possible lab experience?

In this workshop, we wiped the slate clean of the way we do things now and imagined there are no financial, space or labour limitations. We worked together to create a new future of lab and project support, to ensure we deliver teaching excellence in all we do.

OUTCOMES

- > **Course preparation:** clear listing of services available; outline workflows, processes and timelines for tasks; have clear, articulated institutional goals, to be embedded in courses; provide flowcharts to aid course design; and provide support and an updated course-design handbook to convenors.
- > **Work together:** optimise inductions; and advertise available services (e.g. makerspace).
- > **Labs:** interactive, project-based labs; small-group work; more and better-trained tutors; disseminate a lab code of conduct (understanding what's expected and required) early in semester; align lecture content and labs; encourage peer-to-peer collaboration; consult with technical staff about curriculum design and delivery; support technical staff to help and mentor students (and recognise them for it); and have better IT support.
- > **Other comments:** technical staff consultants – have a central register online; enable technical staff to manage and oversee lab resource management; and actually use central technical-request email function rather than relying on ad-hoc, in-person requests.

CODE/CREATIVITY/CULTURE CURRICULUM DESIGN WORKSHOP

Ben Swift



Is it possible to learn about algorithms by writing poetry about wealth inequality? How about commenting on social media use via sculptures built using cybersecurity tools and concepts? Furthermore, is it possible to design an assessment task which encourages deep technical work and honest cultural reflection, in producing a genuinely interesting creative outcome?

This workshop brought together folks from all points of the code/creativity/culture compass, to design a real assessment task for the c/c/c studio creative code outreach program. In fact, it needed a diverse range of voices to work properly. We got people with thoughts and ideas about CS/Engineering curriculum design, the arts, and life within the socio-technical assemblage of our present age, to come along and have their say.

OUTCOMES

- > **Pedagogy:** promote responsibility and agency in group work; allow students to get out into the real world; take a cross-disciplinary/Liberal Arts approach; and encourage learning through exploration and appropriately-scoped tasks.
- > **Assessment:** assess knowledge application, and understanding through assessing processes not outcomes; make assessment

engaging and effective; encourage reflection; and address the framing of the topic and how it is important.

- > **Marking criteria:** need to be genuinely relevant, reasonable and moderated; include self-assessment of bias and peer-review; and balance not being too prescriptive nor subjective.
- > **Other ideas:** students need to feel that they can contribute (safety in numbers); don't assume students come with the same understanding/expertise; connection/tension between beauty, craftpersonship and functionality; and new methods for assessment design combinations: e.g. networks, immigration and memes -> how computers network security and border security closely align.

Participants commented that they wouldn't have previously made connections between these topics for assessment design, without the learning activities provided (choosing topics from multiple spin-wheel), which resulted in good discussion and innovate thinking.

TOOLKIT FOR CECS ACADEMICS

Lori Sciusco



Are you a creative thinker? Do you have good ideas about what academics need in their 'toolkit' when applying for grants, or securing industry collaboration for research development?

These are some of the questions we asked, eliciting participants' ideas, views and experiences and to help develop a 'Toolkit for CECS Academics'.

We asked a range of participants to provide their unique insight on how we could improve the research development process from the perspective of industry, government, HDR students, academics, administrators, school managers, grants and business development professionals.

In this interactive workshop, groups worked together to develop a 'first cut' of what a toolkit might look like. Participants considered a set of questions, during the 1.5-hour workshop, that required them to reflect on their experiences, and challenge them to consider the expectations of industry, HDR student, academics, professional staff, other related operational areas in the University.

OUTCOMES

> **Teaching and learning:** mix physical and virtual learning (as can't entirely replace the

on-campus experience); offer micro-credentials and modularised learning; teach fundamentals of ethics and collaboration; promote industry and global interaction/exchange; support student innovation; and reward good teaching.

- > **Relationships:** have genuine (not just transactional) relationships with the community; consider inviting key partners onto campus; collaborate, but not at the expense of freedom; and engage in positive, 2-way links with industry, in which differing aims, paces and expectations are clearly articulated from the start.
- > **Research:** make research accessible; make measures of success include social impact, engagement with industry and innovation; and maintain a central database of current research and industry collaborations.
- > **Structural:** become an institution that encourages, and equally rewards, different academics (blue sky, translational, teaching); is integrated (with community, schools, industry, government and the wider world); and is environmentally sustainable.
- > **Ideas:** allow academics to take sabbaticals to work in industry; have a central point of contact for industry; and promote sound leadership, sufficient resources and sharing of knowledge.

DESIGNING THE FUTURE OF ENVIRONMENTAL ENGINEERING AT THE ANU

Wojciech Lipinski



In CECS, we are building a modern, interdisciplinary educational program of global significance for engineers and computer scientists. An early step in this process is developing a new environmental engineering degree, and we have been looking for diverse voices to inform its development. This workshop explored what our new degree should look like, and sought input and insights from participants to help shape the degree development process.

OUTCOMES

> **Design principles:** an interdisciplinary, collaborative, solutions-focussed degree, which helps students to manage conflict, and help both humans and the environment thrive; include co-design and complexity theory; make the degree as open as possible (both in terms of access and also choice to take courses outside engineering); have a national focus; teach core engineering skills; and concentrate on regeneration and transformation.

- > **Pedagogy:** problem-based learning (75% real-world, industry projects), with sustainable development, systems dynamics and remediation incorporated; core, team-taught courses (e.g. sociology, maths, physics, modelling, economics, ethics, computing) including first year Fenner courses; encourage taking of a wide range of electives; collaborative course/teamwork with engineering, environmental science, policy and law students and faculty; and micro-credentials (especially GIS skills).
- > **Structure:** links with other schools (especially Fenner, Earth Science, Health and Medicine) and degrees (e.g. flexible double); relationships with industry; and possibly make environmental engineering/sustainability a core component for all engineering degrees.
- > **Other ideas:** decreasing barriers to entry (e.g. offer bridging courses) as technical specialisations would need basic maths; consider certification through Engineers Australia.

LEAD FROM WHERE YOU ARE: LEADERSHIP DEVELOPMENT FOR HIGHER DEGREE BY RESEARCH STUDENTS

Cathy Ayres



Higher Degree by Research (HDR) students commencing right now will be the leaders of their fields, in the middle of the century. These leaders will require extraordinary leadership and vision. The Future Leaders in Engineering and Computer Science (FLECS) program will provide opportunities for HDRs to build and develop their leadership capabilities as early career researchers.

This workshop was an in-depth, interactive consultation and discussion of the challenges facing our HDR students, how we could create opportunities for leadership development in our HDR cohort, and how we could make the CECS HDR (and, by extension, the ANU PhD) a truly transformative experience. This workshop provided the foundations for the schedule of forums and seminars that will make up the FLECS program, scheduled to start in 2020, and was directly relevant to HDR students (within CECS and ANU more broadly), HDR supervisors, and all working in HDR matters across ANU.

OUTCOMES

> **Barriers:** lack of time and knowledge; not seeing tangible benefits; current expectations and rules; and cultural constraints.

- > **Enablers:** flexibility; focussed programs (at the school level) that also interact with wider communities; empathy; cross-disciplinarity and the chance to meet new people; formal recognition (e.g. micro-credentials); a mix of compulsory and non-compulsory modules; and workshops, retreats and industry partnerships.
- > **Skills for development: communication:** PhD-related skills (presentation skills, collaboration, project and supervisor management, career pathways, translating PhD skills to industry); soft skills (people management, problem-solving, personal management); empathy; self-awareness and understanding of own value; and decision-making and reflectivity.
- > **Event ideas:** mix of individual (training, check-ins, online content, checklists) and group events (cohort meetings, workshops, retreats, site visits, internships, networking events).
- > **Desires:** a dedicated PhD student space; help with transitions from university to industry.
- > **Leadership traits:** honest and empathetic; collaborative and inclusive; and capable and proactive.

SHARED CONNECTIONS - CREATING AN ENGINEERING POSITIVE IMPACT (E+I) HUB AT THE ANU

Jeremy Smith



This workshop explored the establishment of the Engineering Positive Impact (E+i) Hub at the ANU. The E+ i Hub will create a space for connections, to create shared journeys and shared values for the use of engineering and technology, to strengthen quality of life for all. It aims to connect engineering and technology expertise with other parts of the ANU, community groups, and organisations, to work in partnership to focus on positive changes in human well-being in Australia and our region. This workshop explored ways of working for the proposed E+ i Hub, the values it will embody, the connections it will share, and the impacts of its work.

OUTCOMES

- > **Context:** engage in human-centred design; consider the nature of value and impact; prioritise collaboration, community and choice; consider who a project is working for, who it isn't working for, and who the stakeholders are; assess possible intended and unintended consequences; and work to understand the historical and cultural contexts of a problem to avoid making the same mistakes.
- > **Values:** accountability, responsibility and reliability; open-mindedness and honesty;

generosity and kindness; boldness; social awareness/emotional intelligence; justice and equity; empathy and valuing people; collaboration; self-reflection; and diversity.

- > **Impact:** translate/co-produce research for impact; promote personal growth and public good; empower others, especially locals; facilitate cultural and institutional change; improve opportunities; and recognise that journey vs. story is important – sometimes you only need to help locals to have the confidence, in order to solve the problems themselves.
- > **Helpful structures:** incentivise collaboration and interdisciplinarity; facilitate networking; avoid prescribing outcomes, which inhibits creativity; maintain regular contact between collaborating parties; help students access internships and professional placements; and encourage lifelong learning; allow space (time and place) for conversations.
- > **Partnerships:** forge long-term partnerships; new potential partnerships identified to support E+i, Reimagine vision, and existing research, education and outreach activities in CECS.

EDUCATION LAB

The Education Lab component of the CoDesign Culture Lab was made up of two distinct parts. The first, was a half-day session where invited speakers from different institutions and organizations around Australia, and internationally, were asked to give brief provocations around what they saw as the most urgent issues related to reimagining engineering, and computer science education. In these presentations, they were asked to draw on their own experiences, connect them to patterns of global change and to contribute to what we at ANU might do, as we stand at the beginning of the Reimagine investment.

The second, was a full day CoDesign workshop where Culture Lab attendees were asked to work through a set of design challenges, and push the discourse forward at CECS for how we will change our own approaches to teaching and learning, in the context of the challenges of our time and the future.

This day and a half of shared learning and ‘hands on’ engagement (with the issues critical to our CECS community) built on previous internal discussions at CECS amongst faculty, staff and leadership, and on external engagements with industry groups throughout the greater region. Specifically, we hosted two faculty Education Lab workshops at ANU in June and August 2019, three industry/private sector workshops in Canberra Sydney and Melbourne in April, May and June of 2019, and one workshop with Indigitek - a network of Indigenous people who work at the intersection of culture and science, technology, engineering and mathematics - in August 2019. Insights and priorities drawn from these activities informed the themes and approach of the Ed Lab workshop run at the Culture Lab, particularly informing the Design Challenges proposed to workshop participants.

In this report, we will share some of the content provided by our Education Lab speakers/provocateurs, and then provide a summary of the work done by each of the 10 groups; exploring a specific design challenge related to educational change.

Some examples put forward by one, or more, of the groups working through the Education Lab design challenges include:

- > Everything originates from a supportive underpinning educational philosophy, which is: multidisciplinary and partnership-focussed; embraces difference and diversity (through both culture and physical spaces); has Indigenous cultures and leadership at the core; encourages creativity, flexibility and adaptive mindsets; and is guided by honest, collaborative, inclusive leadership.
- > Evidenced-based, well-supported learning and assessment, which includes: project- and problem-based learning; self-directed learning and self-reflective inquiry; an iterative and experimental approach to learning that provides a safe space to learn through failure; access to industry internships and idea development through quasi-enterprises; and marking criteria that are relevant, reasonable and moderated.
- > Flexible entrance and exit requirements which support life-long learning, through: diverse entrance pathways (e.g. lower entrance scores but providing bridging courses, framing disciplines as humanitarian and about problem-solving); offering micro-credentials and

a ‘live transcript’ such that students can continue to take courses and be accredited throughout their lifetime; and flexible degree requirements.

- > Embedded culture of diversity and inclusion, through recognising and encouraging multiple intelligences and ways of knowing, and diversifying cohorts, leaders, ideas, and pathways to success.
- > Supporting teaching excellence, by providing: clear online course descriptions and listing of services available (e.g. a catalogue of professional/technical staff and their skills, like academic staff have); time horizons for course planning; a laboratory code of conduct, covering expectations and responsibilities for staff and students; booking of technical staff as consultants (and recognition as such); and active support and recognition of all teaching staff (including technical staff and tutors) and those who support learning.



INNOVATION IN TEACHING AND LEARNING: REFLECTIONS FROM LEADERS IN THE FIELD



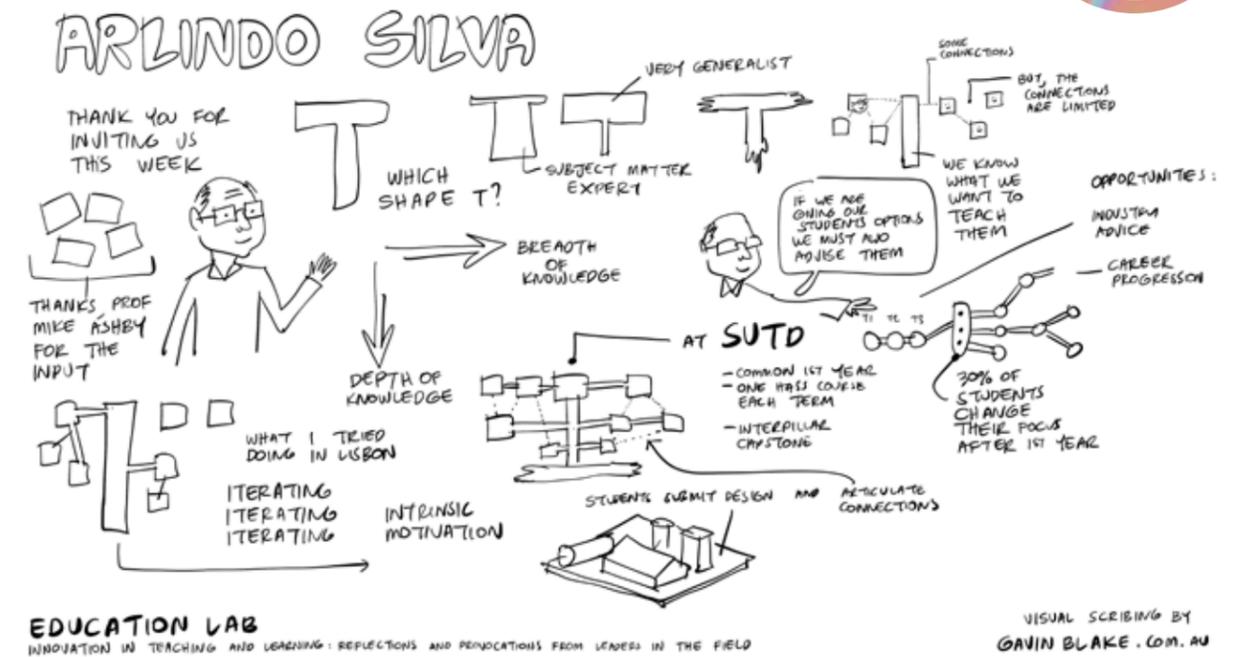
At CECS, and more broadly at the ANU, we are not alone in asking deep and probing questions of ourselves around how we might change the way we approach teaching and learning. Many of our peer institutions around the country, and around the world, have also engaged in a process of changing and updating teaching methods and approaches to learning that are fit for the middle of the 21st century and beyond. Before we asked the Culture Lab attendees to reflect on the future of education in an ANU context, we wanted to learn from the experiences of some of our peers, and to understand a little more about the values that underpin the work they have done.

More specifically, we asked our invited Education Lab speakers to use their talk to share issues of importance to them, as we look at how (and what) we teach and learn in our institutions; and to act as provocateurs who help people think beyond the mechanics of any immediately visible barriers to change. Our intention was for these talks to provoke people into thinking about new possibilities, and new perspectives on known problems and limitations.

Each of our presenters was asked to limit their talks to 12 minutes, and we took questions from the audience to our speaker/provocateurs as a group. Below is a summary for each Education Lab Leader talk, produced by graphic artist Gavin Blake, who attended the entire session and was asked to be a 'graphic scribe' for documentation purposes.

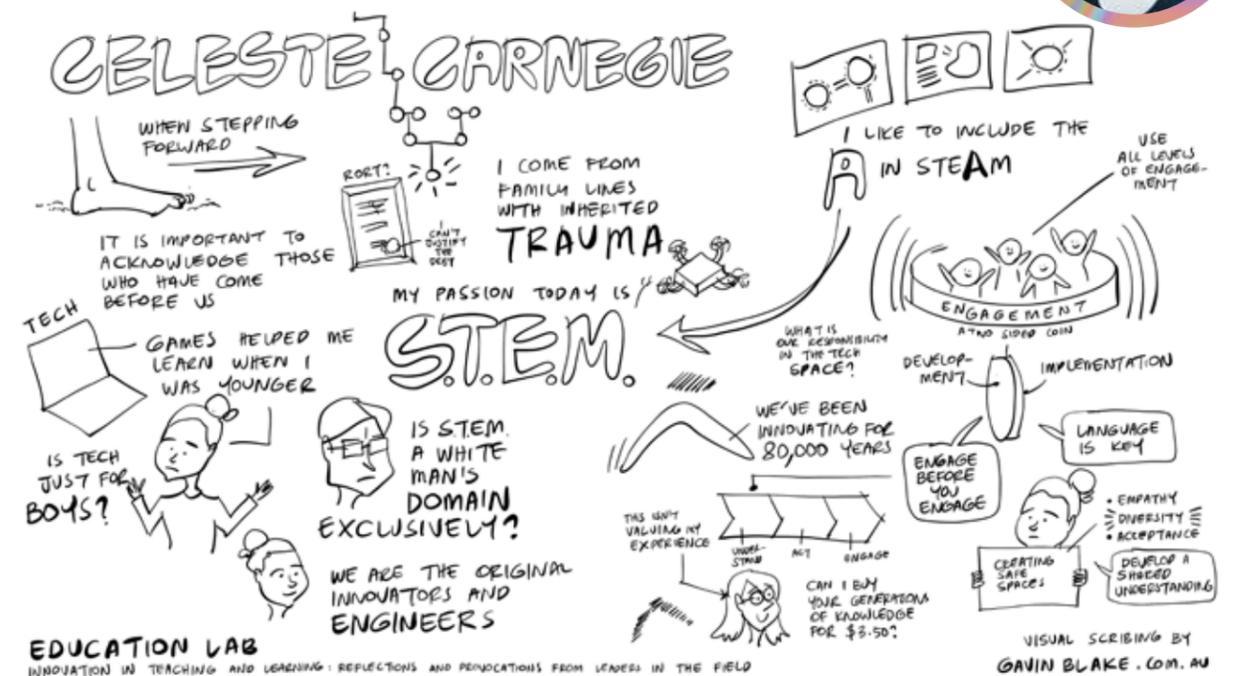
ARLINDO SILVA

Associate Professor, Singapore University of Technology and Design



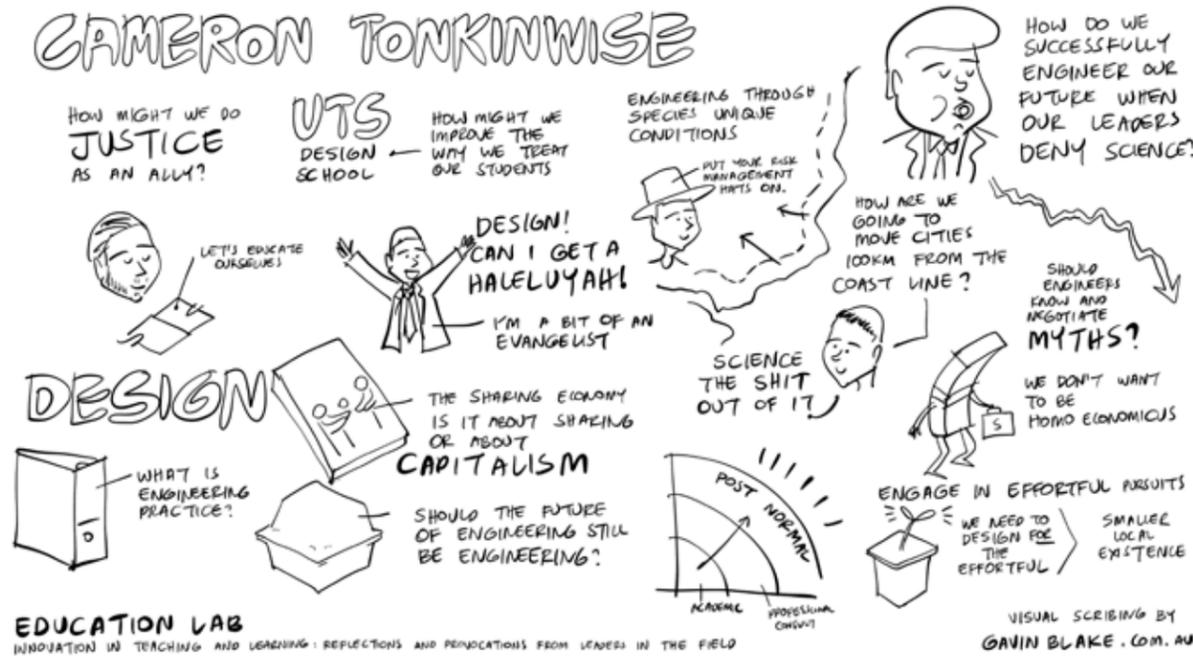
CELESTE CARNEGIE

Girl Geek Academy



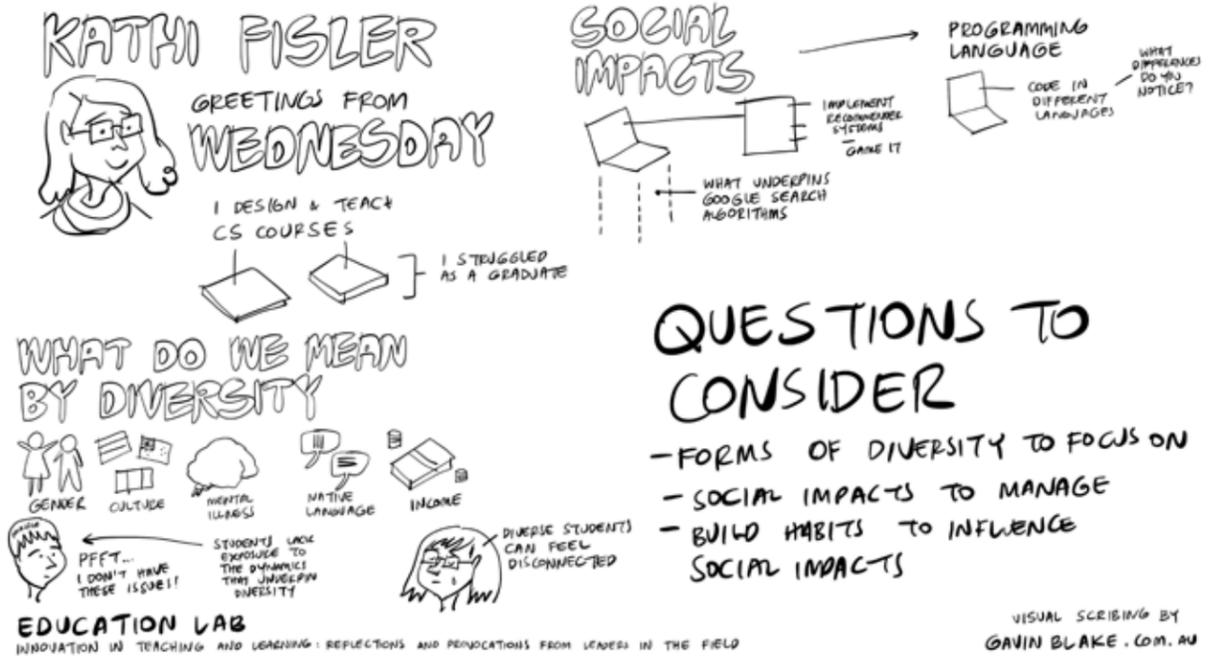
CAMERON TONKINWISE

Professor of Design Studies, Director, Design Innovation Research Centre, University of Technology Sydney



KATHI FISLER

Professor (Research) and Associate Director of Undergraduate Students, Brown University Dept of Computer Science



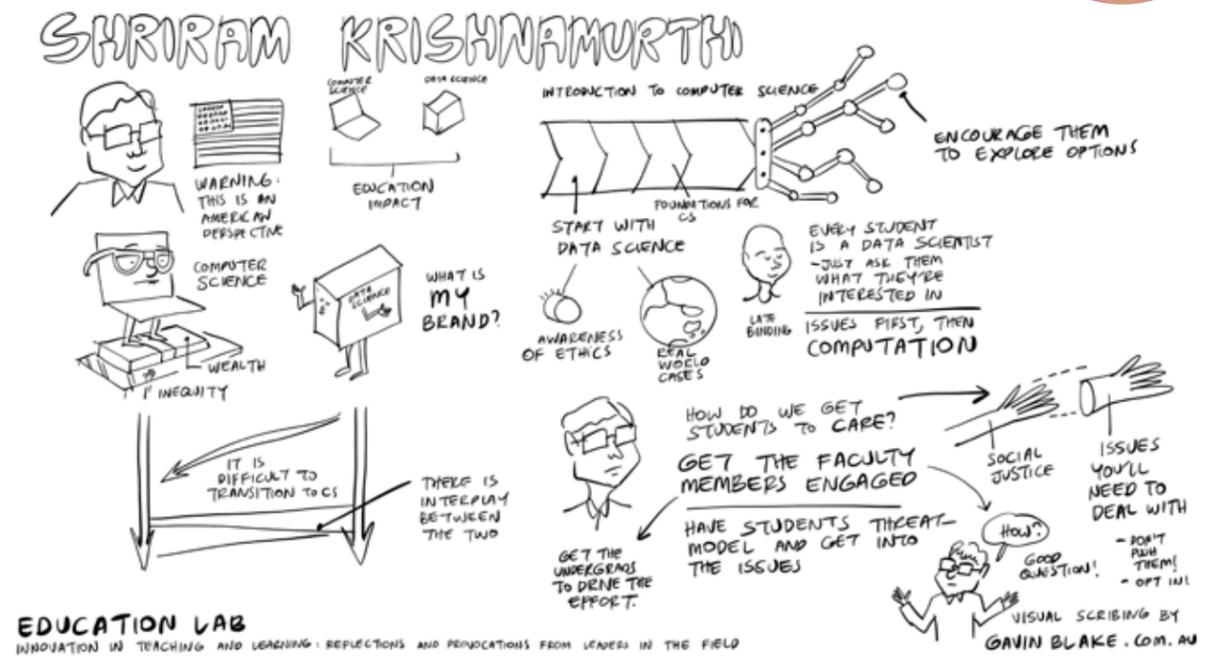
ABEL NYAMAPPENE

Programme Director MSc Engineering & Education, Principal Teaching Fellow (Integrated Engineering Programme), University College London



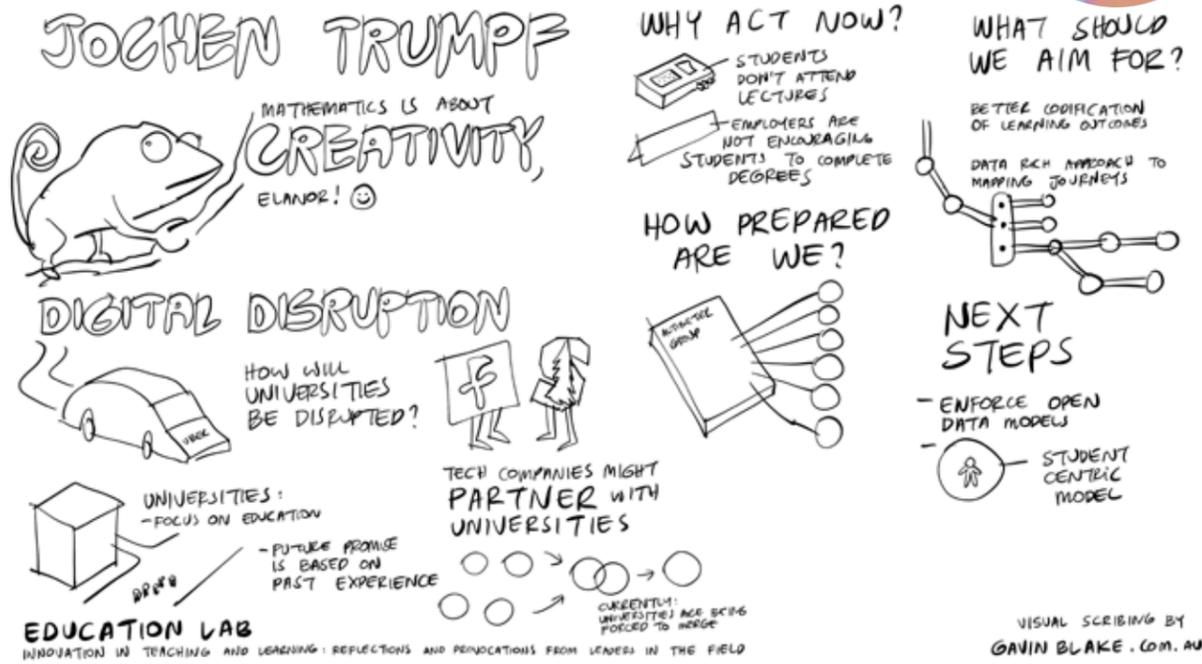
SHRIRAM KRISHNAMURTHI

Professor of Computer Science, Brown University Dept of Computer Science



JOCHEN TRUMPF

Associate Professor, Director Software Institute, ANU College of Engineering and Computer Science



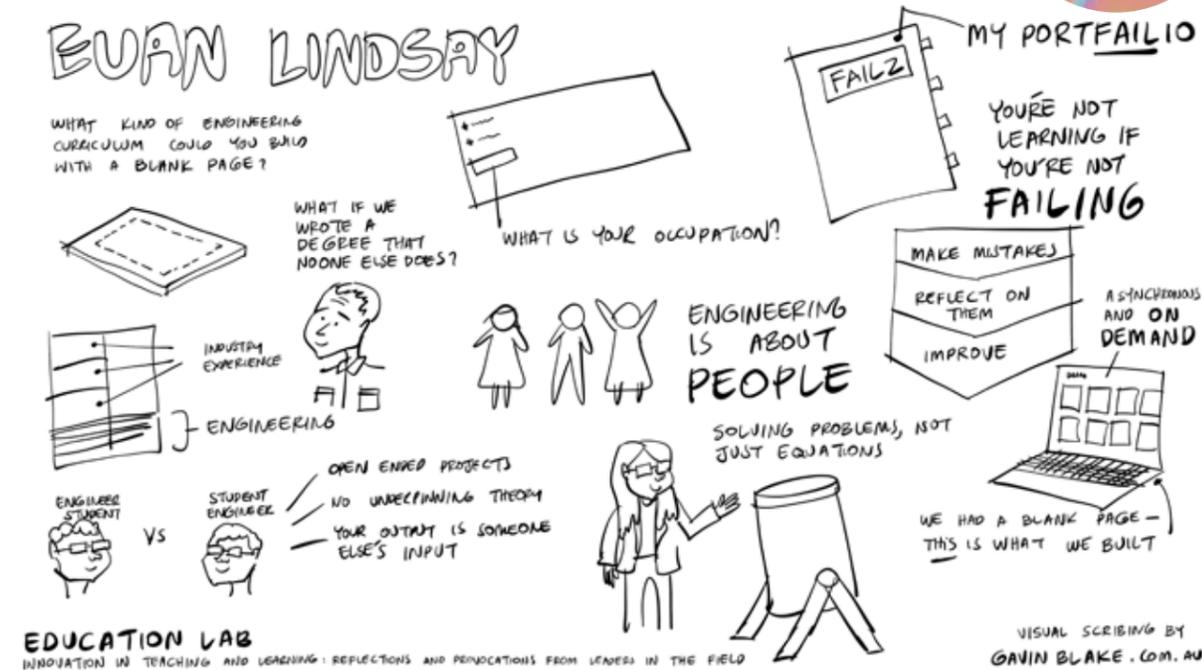
KARL KANE

Senior Lecturer, Design, Director, Design+Democracy Project, School of Design, Massey University



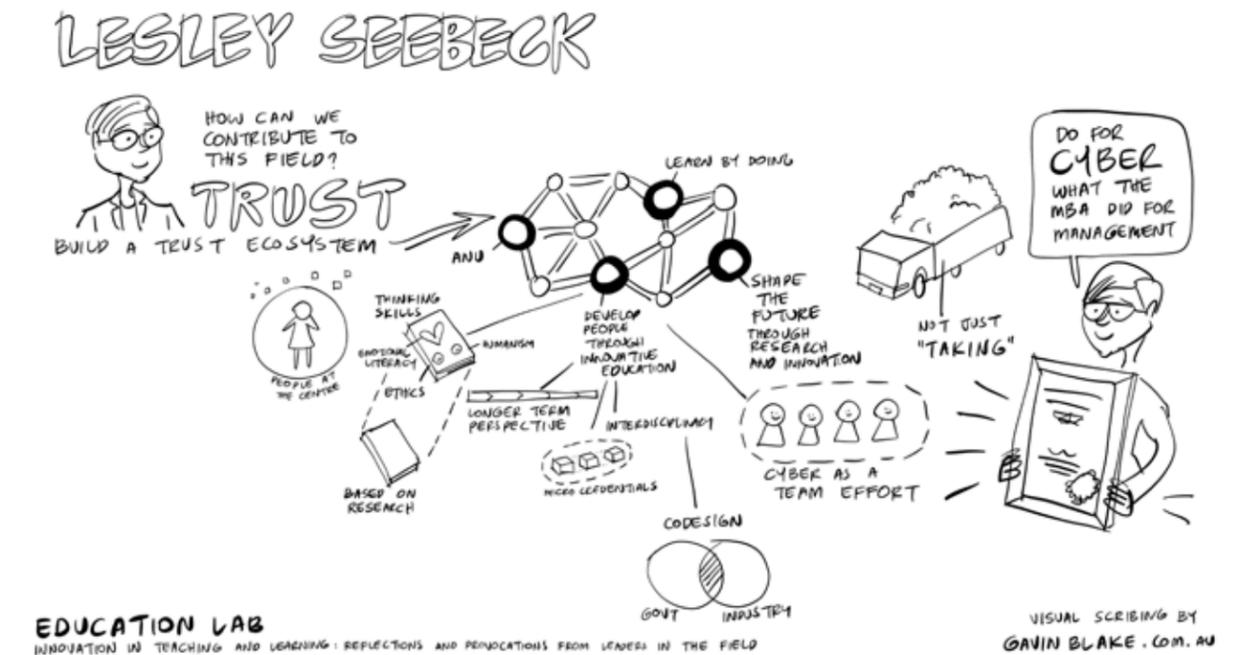
EUAN LINDSAY

Director, Charles Sturt University Engineering Foundation, Professor of Engineering



LESLEY SEEBECK

Chief Executive Officer, Cyber Institute, ANU College of Engineering and Computer Science



EDUCATION DESIGN CHALLENGES

The final day of the Culture Lab was devoted to small group work around a set of 10 design challenges. As described earlier, these design challenges were developed through multiple engagements with CECS faculty and staff, as well as interested groups from within the public and private sectors.

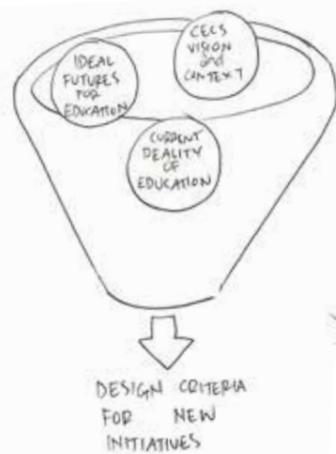
Our specific objectives for this session were to:

- > Explore a range of Design Challenges that look at different components of the future of education
- > Envision a future of education that has addressed key challenges in the current context
- > Reflect on personal experience and what has been shared during the Culture Lab to identify what to build on and what to improve
- > Develop a set of design criteria for each Design Challenge to provide guidance and success measures for future initiatives in education

All Culture Lab attendees were able to select which design challenge they were most interested in working with. The groups stayed with the same challenge for the entire day.

Our methodology required that each group first interrogate the design challenge, as it was framed. In this process, each group was given the opportunity to reframe the challenge. Moving forward with the reframed design challenge, each group worked through what was currently working well, and what was not working well, relating to their challenge. In looking towards the future, each group was then asked to come up with design criteria to evaluate any work that addresses that design challenge. It was intentional to work towards design criteria, and not specific proposals, as we are still in the early stages of conceptualising how teaching and learning will evolve and change at CECS; and our goal is to CoDesign durable infrastructure that guides this process, rather than attempt to author the specific modes of change.

The following pages summarise the work of each of the groups, showing the original design challenge, the reframed design challenge, proposed design criteria for moving forward, a summary of what is working well and what is not working well, strong themes from within each group discourse, and in some cases some more specific ideas for action that emerged from discussions.



DESIGN CHALLENGE #1

HOW DO WE EMPOWER AND EQUIP STUDENTS TO ENABLE AND PARTICIPATE IN TRANSFORMATIVE PRACTICE TOWARDS A SUSTAINABLE AND EQUITABLE FUTURE?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT WE EQUIP STUDENTS TO ACT FOR SOCIAL BENEFIT AND CONSIDER THE UNINTENDED CONSEQUENCES OF TECHNOLOGY?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > include educational initiatives that have clarity of purpose;
- > create institutional accountability;
- > maximise student resilience and faculty professional development;
- > foster sustainable, generative and mutually-beneficial relationships;
- > ensure the context of problems is well understood, including actively collaborating with local communities and seeking out missing voices/perspectives;
- > minimise environmental impact

WHAT CURRENTLY WORKS/COULD WORK WELL:

strong partnerships and institutional support; embracing complexity; constructivist, inquiry-based, immersive learning, based on real-world problems; multidisciplinary; humanitarian engineering; embedding sustainability, equity and a strong sense of purpose and impact; and advocating regenerative engineering and economics.

WHAT DOESN'T WORK WELL:

linearity; placing sustainability as an afterthought; lack of/poor collaboration; lack of financial support; and working in silos.



THEMES:

self-reflective inquiry; complexity; purpose; partnerships; sustainability and equity; and regenerative approaches.

IDEAS:

utilise effective altruism/social benefit projects and contexts to build learning and transformation; joint community/university appointments; country-centred design; residences and short-term immersive experiences; team teaching.

DESIGN CHALLENGE #2

HOW MIGHT HIGHER EDUCATION AND INDUSTRY AND COMMUNITY WORK TOGETHER TO BETTER INTEGRATE AND DEFINE EDUCATIONAL ENCOUNTERS?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:

~~HOW MIGHT COMMUNITY AND INDUSTRY BETTER INFORM WHAT IS BEING TAUGHT, HOW IT IS BEING TAUGHT AND WHY IS IT BEING TAUGHT?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

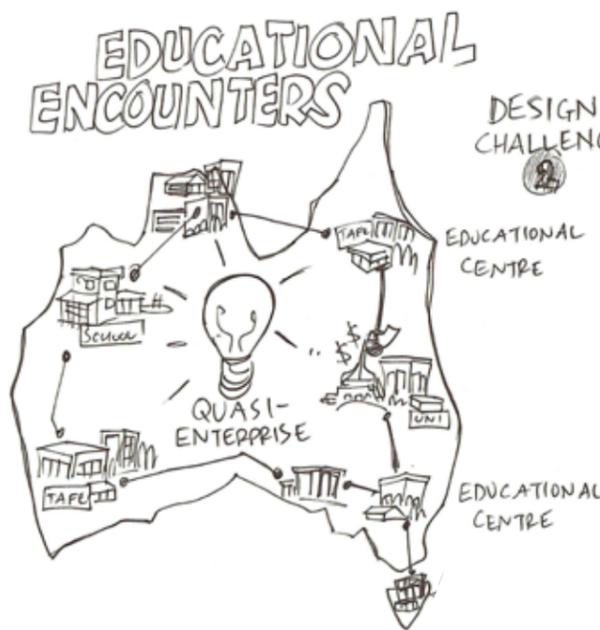
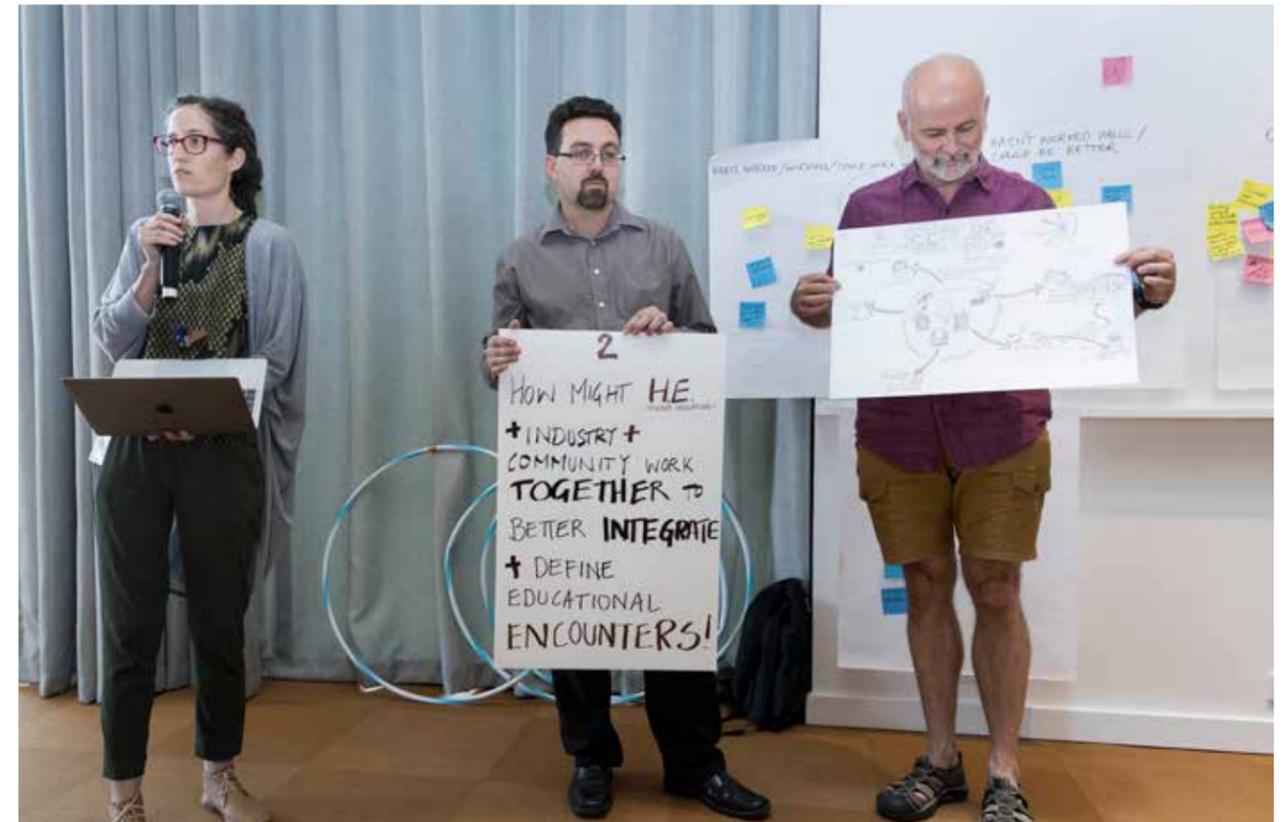
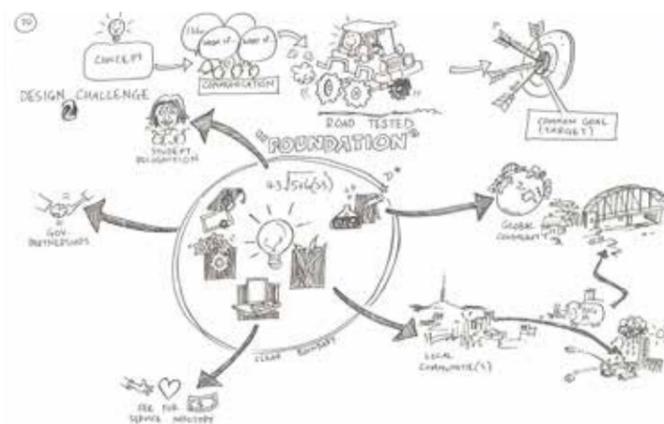
- > be integrated in nature, valuable, and distributed (throughout campus and industry);
- > establish common ground between all participant groups;
- > develop known responsibilities and boundaries;
- > maintain the university as the party ultimately responsible for students' education;
- > have distributed ownership and access;
- > be future-focussed and financially supported, with multiple funding sources;
- > foster academic freedom.

WHAT CURRENTLY WORKS/COULD WORK WELL:

tech launcher and other related problem-based/integrated design projects.

WHAT DOESN'T WORK WELL:

the status quo; current/poor expectations management and increasing workloads; and different paces/timelines of higher education and industry.



THEMES:

access, scale, pace, engagement, expectations, and academic exchange.

IDEAS:

most of the design criteria listed above are in relation to the key idea put forward, that of a cross-institutional, university-based quasi-enterprise; consisting of partnerships between students, higher education institutes, industry, the community and government, to provide paid, meaningful, real-world learning for students and beneficial social outcomes. Other ideas included an industry Honours year, and opportunities for integrated work-experience/"proper jobs" that are earned but supported.

DESIGN CHALLENGE #4

HOW WILL WE CREATE AND SUPPORT PRACTITIONERS WHO CAN CONFIDENTLY SHAPE RESPONSES TO CHANGING KNOWLEDGE AND CONDITIONS?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT WE SUPPORT AND CREATE PRACTITIONERS RESPONSIVE TO CHANGING KNOWLEDGE AND UNKNOWN FUTURE CONDITIONS?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > embed life-long learning;
- > balance emphasis on technological and societal change;
- > improve student agency and personal responsibility for learning;
- > increase social accountability;
- > promote interdisciplinarity and diversity;
- > encourage creativity and oblique thinking.

WHAT CURRENTLY WORKS/COULD WORK WELL:

tech launcher; tapping into deep existing expertise; strong foundations; teaching ethics and social responsibility early; flexible education; working well together and group recognition/rewards; creativity; university enrolment for life; group work with industry; diversity (including cultural and SES); and problem-based and research-led teaching and learning.

WHAT DOESN'T WORK WELL:

not incorporating discussion of ethics early in degree; disciplinary silos; and individualism/individual marks for group work.



THEMES:

open-ended/life-long learning and engagement with the university; social responsibility; ethics; flexibility; and interdisciplinarity.

IDEAS:

'live' (continuous) transcript, so that learners can continue to gain (micro-) credentials throughout their life and have them officially recognised; questioning when in a degree the foundations should be taught (first year or spread throughout as needed?)



DESIGN CHALLENGE #5

HOW MIGHT WE EMBED FAILURE AS ONE OF OUR VALUES?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT WE BETTER SUPPORT EXPERIMENTATION THAT VALUES THE LEARNING OPPORTUNITY REPRESENTED BY FAILURE?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > involve iterative and experimental learning;
- > allow multiple pathways to an outcome;
- > encourage curiosity and creativity;
- > be non-punitive;
- > allow students to experience failure, but be expected to succeed;
- > not incentive failure itself, but learning through it

WHAT CURRENTLY WORKS/COULD WORK WELL:

cross-sector engagement; workplace learning; smaller institutes (e.g 3Ai, Cyber Institute); living your values; and allowing safe spaces for failure (e.g. through portfolios, where you document your 'fails' and how you will learn from them)

WHAT DOESN'T WORK WELL:

rigid assessment goals; fail-phobic structures (e.g. grading, high ATARs [fail-phobic cohort]); and failure not accepted nor encouraged.



THEMES:

“fail fast, fail more and fail upward”; reflection; allowing small failures in a safe environment prevent catastrophic failures (learning through failure); and agile timelines.

IDEAS:

Ideas Lab; portfolios; remove grades; offer personalised degrees based on students' differing acceptance of risk.

DESIGN CHALLENGE #6

HOW MIGHT WE DESIGN OUR PROGRAMS TO CATER FOR MORE DIVERSE LEARNERS TO EXPAND THE REACH AND BENEFIT OF OUR EDUCATION?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT WE DESIGN OUR PROGRAMS TO CATER FOR MORE DIVERSE LEARNERS/STUDENTS TO EXPAND THE REACH AND BENEFIT OF OUR EDUCATION?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > foster creativity, innovation and student agency;
- > support a culture of continuous improvement;
- > acknowledge and address learner diversity (e.g. multiple forms of intelligence and ways of learning);
- > support academic staff to become better teachers;
- > allow flexibility in degree structure (e.g. not having to declare major or degree until after first year) and exit pathways;
- > support all stakeholders (students, academic and professional staff, tutors);
- > improve student-student and student-staff relations

WHAT CURRENTLY WORKS/COULD WORK WELL:

team teaching; independent/self-directed learning; portfolios/diverse university entrance methods; problem- and project-based learning; diverse students and teachers; using evidence-based teaching (e.g. lessons on knowledge acquisition from neuroscience); and providing diverse learning outcomes.

WHAT DOESN'T WORK WELL:

teaching subjects in a singular manner; linear learning; lack of team teaching; and poor social environment in labs.

THEMES:

social and academic/professional development support; access (including for low-SES students); flexibility and diversity; and social support.

IDEAS:

outreach programs (especially for low-SES students/ areas); more descriptive (public) course outlines; team teaching, including academic, industry, education designer and student representatives; replace SELT with a better feedback mechanism.



DESIGN CHALLENGE #7

HOW MIGHT CECS BUILD A COMMUNITY WHERE ALL GENDER AND SEXUAL IDENTITIES AND EXPRESSIONS BELONG?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT ENGINEERING AND COMPUTER SCIENCE BE SAFE AND SUPPORTIVE ENVIRONMENTS FOR WOMEN, TRANS AND NON-BINARY PEOPLE?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > show understanding and documented consideration of gender and sexual identity issues and belonging;
- > demonstrate measured and accountable progress (both qualitative and quantitative);
- > be intersectional;
- > have documented engagement with relevant groups;
- > be subject to review by the CECS diversity and inclusion team

WHAT CURRENTLY WORKS/COULD WORK WELL:

intersectionality; starting over; sponsorship; celebrating genuine attempts; culture-building activities; raising expectations of behaviour; inclusion for all; embedding inclusion; and diversity and bystander training

WHAT DOESN'T WORK WELL:

exclusion (intentional, ignorance, indifference); separating minorities rather than building communities; and "fixing" women

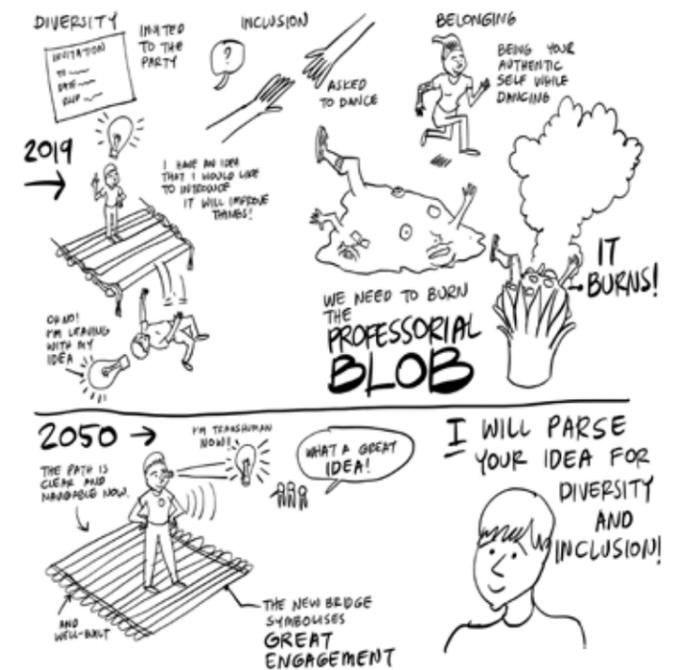


THEMES:

fix systems not women; work for impact not intent; improve values, behaviours, expectation and accountability; and engage in sponsorship and mentorship

GROUP 7

HOW MIGHT CECS BUILD A COMMUNITY WHERE ALL GENDER IDENTITIES AND SEXUAL EXPRESSIONS BELONG?



IDEAS:

women-only intakes (to address overall gender imbalance); "rate-my-teacher" leaderboards for inclusive practice; make inclusion a key staff performance metric; and Privilege 101 courses for staff and students



DESIGN CHALLENGE #8

HOW MIGHT ENGINEERING AND COMPUTER SCIENCE DECOLONISE TO BECOME SAFE AND SUPPORTIVE FOR ABORIGINAL AND TORRES STRAIT ISLANDER PEOPLES?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT ENGINEERING AND COMPUTER SCIENCE BE SAFE AND SUPPORTIVE FOR INDIGENOUS PEOPLES?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > decolonise;
- > invest in and benefit Indigenous peoples and embed cultural knowledge;
- > be safe and accessible (e.g. available remotely, micro-credentials, knowledge repatriation);
- > support students to engage in cultural practices;
- > address the unique challenges facing Indigenous students (including cultural isolation and financial barriers);
- > encourage Indigenous leadership

WHAT CURRENTLY WORKS/COULD WORK WELL:

decolonisation; critical mass of Indigenous people (i.e. have more than 1! Cross-appointment with Tjabal so not culturally isolated?); flexibility; free education/fee waivers and living scholarships for Indigenous students; embedded cultural education (for non-Indigenous); decentralised learning/bring to community (e.g. Alice Springs campus); and Indigenous-led learning

WHAT DOESN'T WORK WELL:

isolation (e.g. lone Indigenous person); too many contact hours/strictly applied; and relying on Indigenous people to continually educate non-Indigenous people

THEMES:

removing social, physical and financial barriers; respect for and integration of culture; appropriate custodianship of knowledge; and Indigenous leadership

IDEAS:

engage from home community via technology; scholarships for students' community; create intergenerational wealth; 'care-taking' not ownership of Indigenous knowledge; Indigenous-only courses; Indigenous engineering courses; CECS Indigenous Institute; invest in whole communities; "Engage [with Indigenous culture] before you engage [with Indigenous people]"



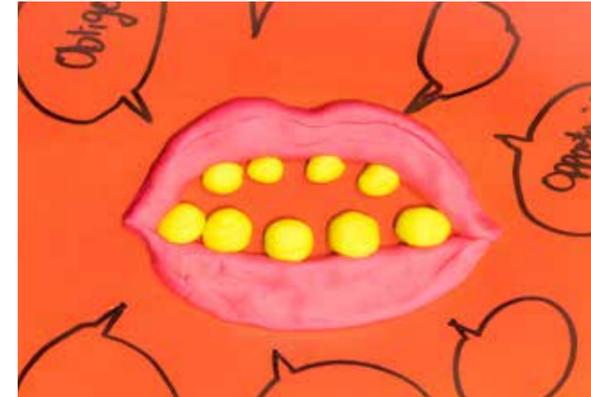
DESIGN CRITERIA FOR CHALLENGE #8



Decolonisation



Cultural practice and responsibilities



Voice/Leadership/participation/ownership



Investing in Indigenous communities



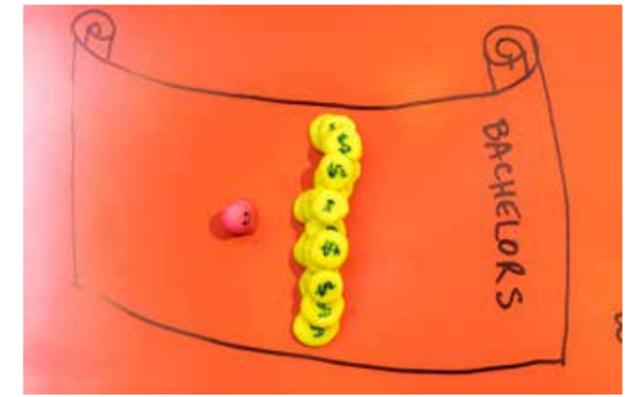
The importance of valuing Indigenous knowledge



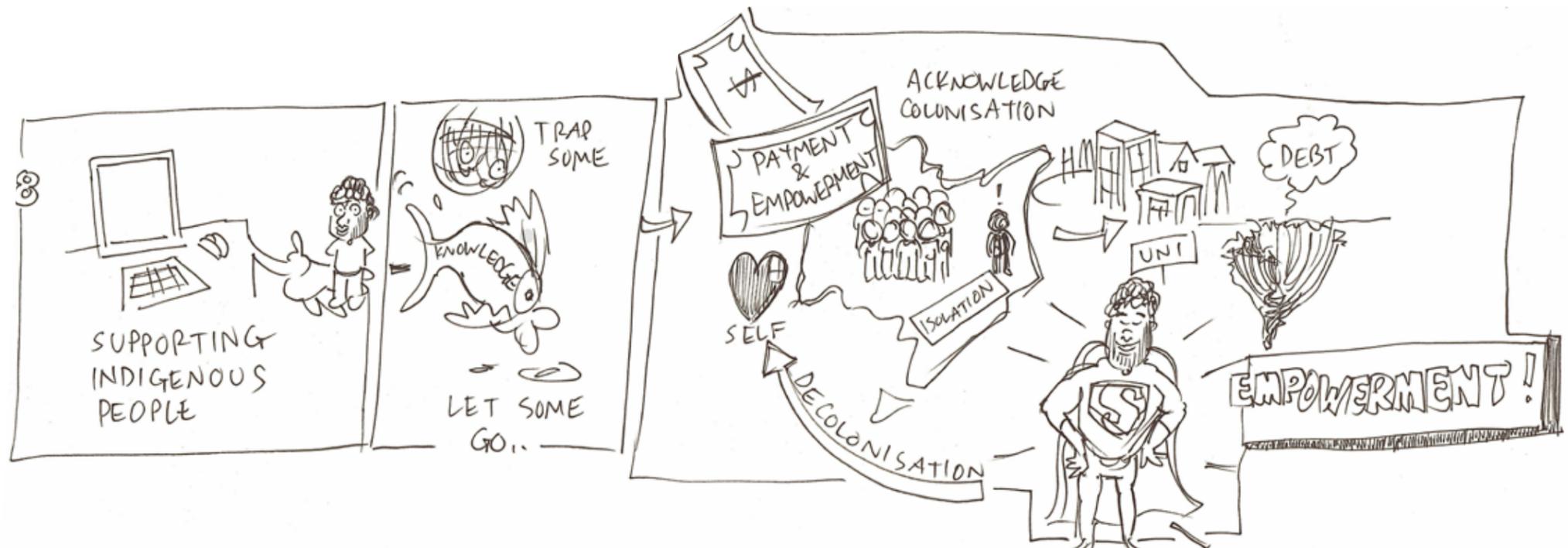
Not extracting, ensuring beneficial relations



Safety - creating strength in numbers



Addressing social barriers and enabling access



DESIGN CHALLENGE #9

HOW MIGHT WE DESIGN OUR LEARNING EXPERIENCES TO ENGAGE AND INSPIRE STUDENTS IN A LIFELONG PURPOSEFUL JOURNEY?

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:
~~HOW MIGHT WE DESIGN OUR LEARNING EXPERIENCES TO ENGAGE AND INSPIRE STUDENTS IN A LIFELONG LEARNING JOURNEY?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > encourage transdisciplinary learning and engagement;
- > provide physical spaces and culture that facilitate collaboration and create community;
- > enhance communication;
- > cater to student diversity and diversify of student experience;
- > encourage life-long learning (e.g. full alumni journal and library access)

WHAT CURRENTLY WORKS/COULD WORK WELL:

explaining the why; having integrative capstone projects; creativity in teaching; rewarding both breadth and depth; research-led teaching; accessible connections with industry; collaboration with other classes and colleges; diverse student opportunities (e.g. exchange, internships, clubs and societies); meaningful work; group morning teas; and problem- and project-based learning

WHAT DOESN'T WORK WELL:

poor engagement (students and staff); physical barriers to learning/collaboration and hot-desking; and plagiarism (suggesting current approaches to encouraging learning aren't working)



THEMES:

transdisciplinary, collaborative and inclusive culture (built environment, industry, community); well-taught and relevant content; and encouraging creativity in learning and teaching

IDEAS:

“start-up” PhD (3 years to start a company); multi-age learning; going on tours to see research labs/research in action; actively approaching introverted students to bring them into the community



GROUP 9

HOW MIGHT WE DESIGN OUR LEARNING EXPERIENCES TO ENGAGE AND INSPIRE STUDENTS IN A LIFELONG PURPOSEFUL LEARNING JOURNEY?

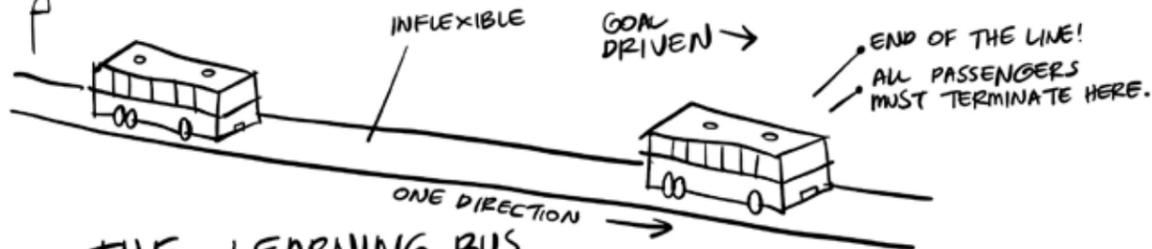


- OUR DISCUSSIONS:
- HOW DO WE FOSTER BETTER CREATIVITY
 - HOW CAN WE DESIGN SPACES FOR CREATIVITY?

MISSED STOPS

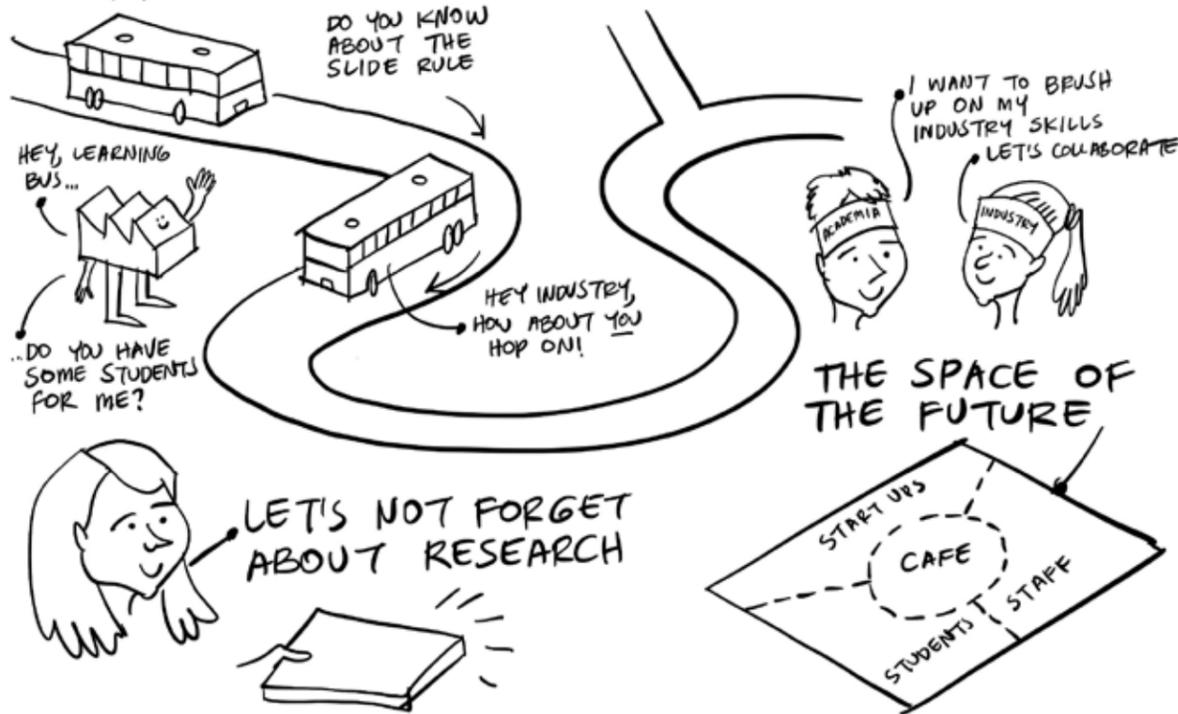
THE LEARNING BUS

ACT ONE: TODAY



THE LEARNING BUS

ACT TWO: THE YEAR 2050



DESIGN CHALLENGE #10

HOW DO WE VALUE AND SUPPORT MEMBERS OF THE ANU COMMUNITY IN WAYS THAT SUPPORT LEARNERS¹ AND LEARNING²?

¹ Students/novices, researchers generating knowledge, professional and academic, staff maintaining expertise, educator disseminating knowledge and framing learning experience

² Lifelong learning for all

ORIGINAL DESIGN CHALLENGE GIVEN TO GROUP:

~~HOW DO WE PROVIDE SUPPORT FOR RESEARCH AND EDUCATION THAT SUPPORTS TEACHING AND LEARNING?~~



DESIGN CRITERIA - SOLUTIONS THAT ADDRESS THIS DESIGN CHALLENGE MUST:

- > provide better workloads,
- > job security and career path opportunities for junior staff;
- > appropriately support and upskill staff and students;
- > reward and acknowledge staff;
- > enable systems to work like clockwork;
- > concentrate on student and staff wellbeing

WHAT CURRENTLY WORKS/COULD WORK WELL:

broad and interesting work; sufficient budgets; makerspace; strong disciplines; responsive and knowledgeable administrators; and staff training and services

WHAT DOESN'T WORK WELL:

poor physical workspaces; poor job security and work/life balance for casual/sessional staff; the unmet need for longer-term planning; lack of consistency, staff and student resilience, and acknowledgement/reward of staff; and current curriculum development



THEMES:

belonging, culture and community; expertise; suitable built environments; intrinsic value of work; recognition for teaching staff; curriculum development; and recognition that “everyone’s learning, everyone’s teaching”

IDEAS:

teaching-training courses for PhD students/new academics; ensure students have required entry skills (including language capability); decreased casualisation; support services and head tutors for larger classes



CONCLUSIONS

The CoDesign Culture Lab primarily aimed to build a community of “critical friendship” amongst our peers through sharing practice, building relationships between people and ideas, and collaboratively developing criteria to guide our work going forward. As such, the event sought to build and maintain a fertile soil from which our current and future work is nourished. Rather than ask “what should we do?”, we asked “how will we evaluate?” the many proposals and possibilities that are put forward, as the Reimagine investment is operationalised. We recognised that CoDesigning robust criteria, against which we can guide ongoing processes of design and implementation, supported by a network of critical friends who will keep us accountable to these collaboratively established principles, will provide a solid foundation for our work over many years to come.

Our engagement of critical friends in the design and implementation of the CoDesign Culture Lab, was oriented both externally and internally. Externally, to engage like-minded as well as provocative thinkers working in other places and other contexts, and internally, to engage our current community of peers at CECS. We focused on creating an atmosphere of sharing ideas and learning from each other, and where the questioning of these ideas in a respectful way was encouraged and welcomed.

Viewed through this lens, the CoDesign Culture Lab was a great success. A diverse group of stakeholders came together and worked over a period of three and a half days, to engage with new approaches to mobilising our knowledge and skill sets, and to work through a series

of challenges and questions around how we activate and evaluate change at CECS.

Many of the recommendations and criteria that have come out of the Culture Lab add weight and support to key concepts, already articulated in the CECS Reimagine Strategic Intent. These cut across each of the College Objective areas of students, education, people, research, engagement and infrastructure. This first round of CoDesign outcomes furthers the process of building out the Reimagine investment from its strategic origin points.

Looking back at the CoDesign Culture Lab, it is important to map out the specific outcomes of the event so we can understand where we stand, as we move forward to specific and tangible actions in the Reimagine investment. Outcomes from the CoDesign Culture Lab include:

Partnership Opportunities - It is inevitable when putting highly motivated and energetic, creative thinkers in a room together, for a few days, that plans for new projects will emerge. This was certainly the case at the Culture Lab, and a number of opportunities to work together in support of teaching and applied research were identified. Many of these opportunities directly seek to address priority issues from the strategic vision, such as achieving gender parity in the college, and addressing the inadequate current state of Indigenous representation in our student and staff cohorts. These factors are in addition to specific research areas that represent new funded revenue stream possibilities, and outreach to new pools of prospective students.

Criteria to Assess Future Action - As described in this report, the goals of the Culture Lab focused on the development of criteria to assess future action, rather than the generation of specific ideas or action plans. In this way, we were building an infrastructure that could be maintained and updated through the ongoing CoDesign process; allowing flexibility for new ideas and proposals to be evaluated in a collaborative context. With education reform considered as the main priority agenda for CECS leadership, our focus was to develop design criteria for new educational offerings, and these have been published in this report. These 10 criteria are intended to help CECS leadership review, and analyse proposals and opportunities as they develop.

A Network of Critical Friends - To CoDesign at this scale we need a broad framework for our ongoing dialogue, and this framework is critical friendship. The idea of critical friendship guided us in the planning and execution of the Culture Lab. A critical friendship is a relationship based on mutual respect and mutual interest, where differences of opinion are seen in service of furthering common goals. A critical friend is someone who is encouraging and supportive, who agrees to speak truthfully, but constructively, about weaknesses, problems, and emotionally charged issues. Critical friends support us through collaboration and the sharing of ideas and experiences, and through keeping us accountable to the principles we articulate.

In addition to committing to work together in this way with our current peers and colleagues, we need to invite new collaborators and diverse

voices into our planning, implementation and evaluation processes. The CoDesign Culture Lab activated this approach by enabling speakers and participants to come from universities around Australia and abroad, and the world (University of Technology Sydney, Charles Sturt University, University of Queensland, University College London, Massey University, Brown University, University of Technology and Design Singapore) and from both private for profit, and not for profit, organisations (Field Ready, Engineers Without Borders Australia, The Centre for Appropriate Technology, Old Ways, New, Indigitek, Arup, GHD, NAB, and more).

The Modelling of Approaches to CoDesign and Collaboration - As stated at the outset of this report, a core objective for the Culture Lab was to model CoDesign as a valued way of working with the College’s internal and external communities and networks of critical friends. Through a series of carefully curated sessions involving a mix of lightning talks, provocations, hands-on workshops, and facilitated group interrogation of design criteria, we led the Culture Lab participants through a rigorous CoDesign agenda. This was designed to encourage participation in the entire three and a half days of programming, but was also structured to allow participants to move in and out of these sessions, as their schedules allowed.

A critical aspect of these ways of working being valued by our communities, relies on what happens next with the work they did.

To continue forward on the pathways mapped out at the Culture Lab, will require a number of commitments to action. These include:

- > Ongoing engagement with critical friends. This can happen across multiple formats and time scales concurrently, and include project specific partnerships/collaboration, regular provocative programming, and new ways of furthering specific conversations through multiple media (such as podcasts, lecture series, art installations, workshops, etc).
- > An active commitment to integrating the thinking and criteria articulated in the Culture Lab into the planning and implementation of the Reimagine investment.
- > Resources to build new projects and partnerships, and a clear path for how to apply for access to resources and how these requests will be evaluated.
- > The courage to experiment, reflect on, revise and embed things that work, and equally importantly, the courage to reflect on, learn from and find new pathways when things don't work.

As the Reimagine investment moves from its pre-launch phase into an official launch in 2020, we offer these processes and outcomes as contributions to how we move forward as a community of practitioners; a community that sees its diversity of ideas, backgrounds, experience, and knowledge, as a core strength in the project of critical self-evaluation and change.

REFLECTIONS

THANK YOU FOR PUTTING THIS EVENT ON

WISHFUL THINKING IS THE FIRST STEP

THANK YOU EVERYONE LET'S STAY FOCUSED ON OUR PURPOSE... AND NOT GET STUCK IN THE MUD

COME TO THE COLLEGE OF DESIGN AND WE'LL HELP YOU WITH THE CONCEPT OF FAILURE... WE CALL IT

IF YOU CAN DO IT - OTHERS CAN DO IT.

TAKE 20 YEARS OFF THE CLOCK 2050 IS TOO FAR AWAY

ITERATION

THANK YOU, DAN, NICOLE, AND MAYA

THIS IS A ONCE IN A LIFETIME INVESTMENT

YOU HAVE THE OPPORTUNITY TO RE-BOOT

THERE IS A GREAT SENSE OF OPTIMISM HERE... WELL DONE.

THANK YOU ALL SO MUCH... I'M LOOKING FORWARD TO SEEING WHAT'S NEXT

YOU ARE THE BEACON ON THE HILL

THINK BIGGER

HOW MIGHT WE KEEP THIS GOING WHAT ABOUT WE MEET AGAIN AND KEEP HAVING THIS CONVERSATION

NICK

THANK YOU ALL DID YOU ENJOY IT?

LEARNING SHARING FUN

JUST WISHFUL THINKING

MY PLEDGE:

- ENACT WHAT YOU COME UP WITH
- KEEP YOU ENGAGED
- HOLD US TO ACCOUNT

PLEASE STAY IN TOUCH

Connect with us on social media @anucecs



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