
Charles Darwin University

Transdisciplinary learning

transformative collaborations between students, industry, academia and communities

Melvold, Jacquie; Nicholas, Adrian; Clifton-Cunningham, Alana; Golja, Tanja; Kutay, Cat; Regmi, Anjana; Vincent, Nicole; Walsh, Sean; Yap, Eng-Hwa; Collective, Co-Creating

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Transdisciplinary learning: Transformative collaborations between students, industry, academia and communities

An example of complex problem solving undertaken through university-industry partnerships to create societal value and impact

The Co-Creating Collective: Adrian Buck¹, Alana Clifton¹, Tanja Golja¹, Cat Kutay¹, Jacqueline Melvold¹, Anjana Regmi¹, Nicole Vincent¹, Sean Walsh¹ and Eng Hwa Yap¹.

¹*University of Technology Sydney*

Subtheme: Innovation in practice: Creating an innovation engine

Nature of activity: life-long learning, curriculum development and delivery, co-design.

Main mechanisms: strategic instrument, operational activity, framework condition.

Level of activity: institution-wide.

Type of institution and size: technical university, large (>35,000).

Keywords

Transdisciplinary; transformative collaborations; co-design; innovation; futures thinking; complexity; collective learning.

Background and objectives

An analogy: Imagine you are invited to a dinner party, but instead of a stuffy sit-down affair, your host asks you to bring your favourite ingredient, and together you prepare a delicious feast of unique and distinct flavours.

UTS's transdisciplinary initiatives are changing the shape of higher education and forging innovative partnerships by bringing together diverse professional fields.

With a focus on practice-based and problem-focused learning, UTS educational programs combine the strengths of multiple disciplines, industries, public sector organisations, and the community to turn real-world problems into rewarding opportunities for education and also "learning for a lifetime".

In place of the limitations of artificial disciplinary boundaries, transdisciplinary learning practices create synergistic and innovative approaches to grappling with complex applied challenges. Students, researchers, practitioners, community members and other stakeholders combine their knowledge, tools, techniques, methods, theories, concepts, as well as cultural and personal perspectives. By understanding problems holistically, the solutions that emerge are bold, innovative, and creative, as well as mutually beneficial. We view this as the future of education: good to work with, and good to think with — problem solving for (and with) industry and society.

The Faculty of Transdisciplinary Innovation is re-imagining how education, research, and professional practice can work together to navigate today's complex problems, and create commercially attractive and socially responsible futures. We also practice what we preach: for example, staff professional development to enact these models in our own teaching;

educational programs to provide experiential learning around problem solving within a rapidly-changing environment involving students from across different disciplines and cultural backgrounds; as well as policy development and research on today's pressing "wicked problems" with industry and government.

Primary objectives of this next practice concept of transdisciplinary learning, include:

- To promote a shift in industry-university engagement from producing "knowledge for society" to co-generating "knowledge with society";
- To build a resilient ecosystem for co-learning;
- To create and sustain future-oriented degree programs with collaboration between industry, government, and community at the centre, geared to prepare our graduates for the complex challenges of a networked world;
- To create an agile and responsive industry-university lab environment for generating and testing new experimental models;
- To enable industry – by collaborating with our students and academics – to see their problems from a fresh perspective, often through different and revealing lenses, and to notice opportunities and spot challenges that may have otherwise been overlooked;
- To prepare students to lead innovation in a rapidly-changing and challenging world; and
- To graduate students who are 'complexity-fluent', systems thinkers, creative problem-posers and -solvers, and imaginative, ethical citizens.

Strategy and activities

Engagement with UTS's many industry, public sector organisations, and community partners repeatedly articulated the value of graduates who can innovate across fields and collaborate in a dynamic environment constantly reshaped by new opportunities and challenges.

As part of a modern 21st century university that is in touch with its students' interests, aspirations, talents, and values – and informed by contemporary strategic drivers – the Faculty of Transdisciplinary Innovation designed and realised future-oriented degrees including the Bachelor of Creative Intelligence and Innovation, the Master of Data Science and Innovation, the Bachelor of Technology and Innovation, the Master of Animation and Visualization, the Diploma in Innovation, and the Graduate Certificate in Transdisciplinary Learning in Higher Education.

Within these degrees, academic and professional staff from across the university come together to learn transdisciplinary approaches to industry engagement. With carefully-matched industry partners, we develop curricula that forefront critical and creative thinking, problem-posing as much as solving, innovation and invention, complexity and entrepreneurship. Multi-disciplinary industry and academic teams design, develop, and teach within our degree programs. Industry, public sector organisations, and communities are engaged in advisory committees for curriculum development, as collaborators who provide the complex real-life context of project challenges or briefs, and as mentors or guest speakers who teach into our subjects.

Encounters with the world's richness and unpredictability, as well as exposure to diverse professional and scholarly fields and practices impart a flexibility to our graduates. A transdisciplinary approach enables them to tackle problems that would be intractable from any single disciplinary or stakeholder perspective, to look beyond the surface, to obtain insights, and to discover opportunities.

These new transdisciplinary degrees enable our graduates to tackle today's complex and interconnected social, environmental, and commercial challenges, and to create opportunities for innovation and social justice. This next practice concept is what prepares them for the future of work, for innovation in their fields, and to actively shape their own future.

Three examples of such transdisciplinary team projects are:

- Workshops with students and industry practitioners to develop shared understandings, and in the process, supporting the development of resilience and agency;
- Industry and community partnerships working with NGOs to co-design and co-realise innovative entrepreneurial ventures and foster cultural diversity; and
- Collective problem framing and co-designing knowledge production with industry, community groups and university staff to co-develop social policy.

In such transdisciplinary initiatives, rich learning activities and experiences for opening new ways of thinking about complex challenges and opportunities focus on:

- Understanding and dealing with complexity;
- Reframing a problem, challenge or opportunity;
- Creating value in problem solving;
- Evolving methods and making practice context dependent;
- Systems mapping and boundary setting;
- Understanding the nature and challenges of transdisciplinary teamwork;
- Engaging in authentic and emerging professional practice; and
- Futuring.

Outcomes and impact

The greatest impact of UTS's transdisciplinary initiatives are evident by:

- The unprecedented growth and demand by students: e.g. new programs continue to be developed to cater for emerging fields of practice and industry-driven opportunities;
- Enriched engagement and transformational collaboration with industry, public sector organisations and communities: e.g. transdisciplinary learning methodologies being prototyped are attracting industry involvement and industry testing;
- Demand from industry for graduates with these capacities, both locally and internationally: e.g. industry partners want to work with students on future-focused projects of high interest to them; and
- Engagement of university staff and practitioners with the opportunities transdisciplinarity provides for addressing complex problems: e.g. university staff re-

skilling to engage with transdisciplinary learning practices and tackling complex problems in research with industry, practitioners and community.

Transdisciplinary initiatives are continuing to develop at UTS. The anticipated impact of these emerging projects (outlined below) focus on the development of new possibilities and relationships that connect industry, communities, students, and academics for ongoing exploration of rich and exciting future-oriented opportunities. These challenges involve creative co-design to identify stakeholders and new possibilities:

- Professional development to support transdisciplinary learning, research, and practice;
- Student projects with industry that have mutually beneficial outcomes;
- Workshops to locate improvements for authentic internships;
- Global/local labs for understanding and respecting both local and international perspectives;
- Producing graduates who are proficient in creating value in problem solving, transdisciplinary practices, entrepreneurship, complex systems thinking, and imaginative ethical citizenship; and
- Flourishing technology initiative to influence public policy.

Focusing on two of these projects, the anticipated outcomes and impact include:

Creating Meaningful Spaces

'Creating Meaningful Spaces' addresses students' positioning between academia and industry with internships or internship-like experiences, both as learning and boundary crossing artefacts to (1) interface students and academia with practitioners and industry, (2) enrich the learning experience and (3) prepare highly sought-after graduates to engage with complex problems.

The impact of these collaborative workshops goes beyond supporting students, academics and industry partners to co-design and co-create learning experiences. All participants experiment and are inspired to continue their transdisciplinary learning journey beyond the space created for the workshop. By doing so, they are meaningfully engaged in the production of knowledge and they are the bearers of their stories and perspectives.

Learning Stories

Being a place of sense-making through the generations with story, song, dance and art – and involving industry and community – UTS's location has been a place of learning since pre-colonial times. The university proactively engages with this past to create a future where students engage with place and context to develop a holistic view of their learning.

Specifically, the learner's journey is a narrative for engaging with new, and making familiar, a transdisciplinary space. One outcome is that the teacher as practitioner co-designs and co-develops a shared discourse, incorporating diverse and time-critical boundary crossing perspectives to enrich learners' insights. Consequently, the narration provides opportunities for knowledge production and knowledge transference for all participants, where the narration becomes a shared and co-created media for mutual learning. The value and impact of providing a narrative to guide students through their social, economic and academic life is yet to be fully understood

Further information

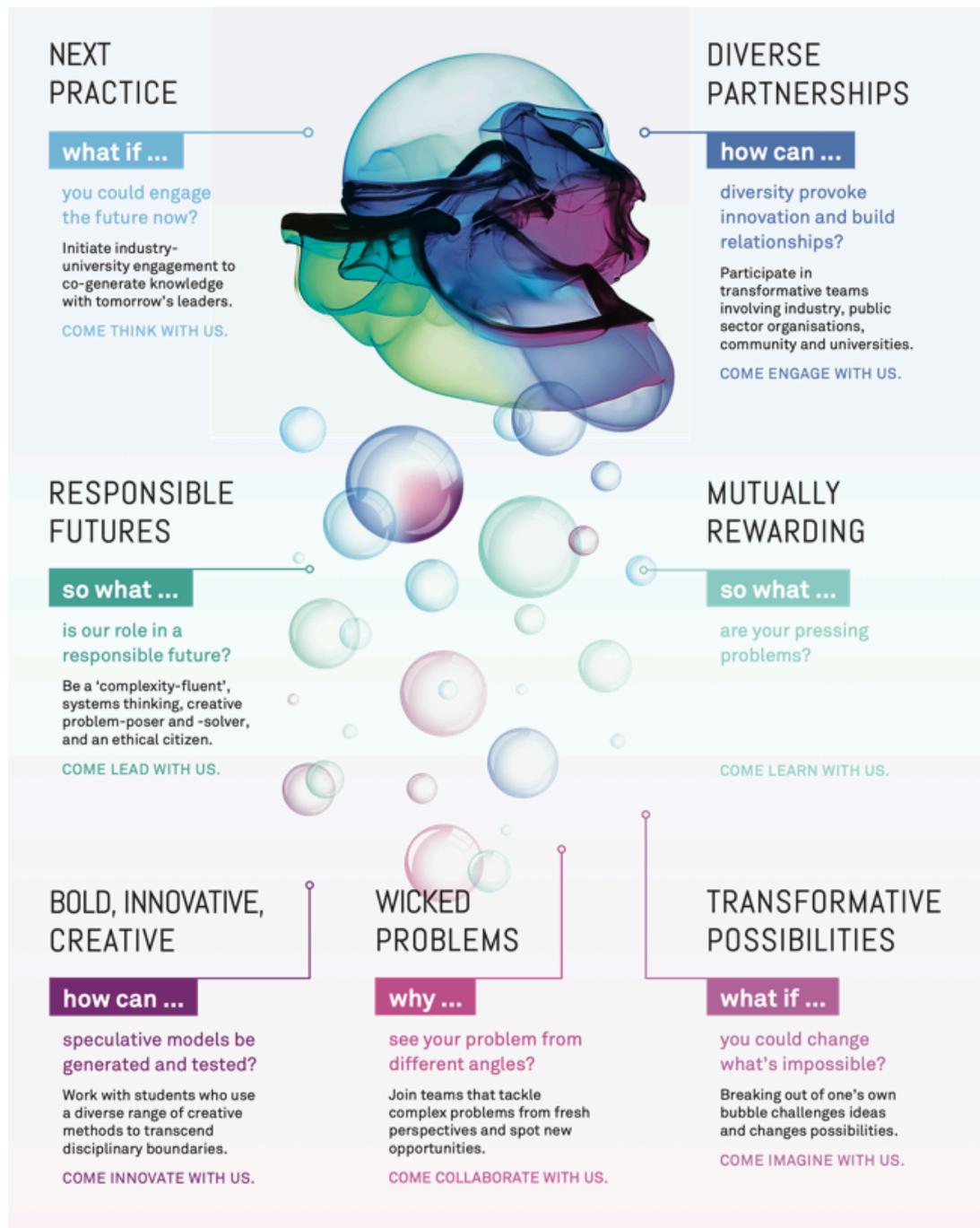
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Transformative Collaborations
between students, industry, academia and communities

The Co-Creating
Collective

