Learning together: A transdisciplinary approach to student-staff partnerships in higher education

Alex Baumber[*a], Giedre Kligyte[b], Mieke van der Bijl-Brouwer[c] and Susanne Pratt [d]

[a b c d] *Faculty of Transdisciplinary Innovation, University of Technology Sydney, Australia*

*Corresponding author: Alex Baumber, Faculty of Transdisciplinary Innovation, University of Technology Sydney, Broadway NSW 2007, Australia. Email: alex.baumber@uts.edu.au

Abstract

Partnership in higher education has gained prominence over recent decades, but recent studies have identified a lack of research exploring how partnership practices unfold in specific disciplinary contexts. This paper explores how a transdisciplinary approach can be used to better understand and facilitate student-staff partnerships where staff and students have diverse disciplinary backgrounds and knowledges. We present a case study of the Bachelor of Creative Intelligence and Innovation at the University of Technology Sydney, focusing on the adaptation of our curriculum co-creation processes by drawing on multiple knowledge types through a reflexive process of mutual learning. We conclude that explicit consideration of these principles, which are common to both transdisciplinary and partnership frameworks, have the potential to enhance consideration of diverse perspectives and the roles played by worldviews, norms and values when building student-staff partnerships around curriculum co-creation.

Introduction

There is a growing body of evidence that highlights how incorporating student perspectives into the design and delivery of education programs can enhance higher education experiences and learning in ways that benefit both staff and students, and even whole institutions (Cook-Sather, Bovill and Felten, 2014; Mercer-Mapstone et al., 2017). While such practices can be framed in different ways, Students as Partners (SaP) has emerged as one of the dominant terms (Healey, Flint, & Harrington, 2014), describing 'a joint endeavour to shape and influence university teaching and learning' (Matthews, 2016, p. 1). Partnership is a specific type of values-based relationship (Matthews, Dwyer, Hine and Turner, 2018b) – 'a collaborative, reciprocal process through which all participants have the opportunity to contribute equally, although not necessarily in the same ways, to curricular or pedagogical conceptualization, decision-making, implementation, investigation, or analysis' (Cook-Sather et al., 2014, pp. 6–7). Partnerships require a renegotiation of roles, power relations and ways of working together to maintain openness to outcomes that are not pre-determined from the outset (Mercer-Mapstone et al., 2017; Matthews et al., 2018b).

SaP encompasses a range of practices and is most commonly applied to staff-student partnership. However, it can also encompass student partnerships with other students or with industry or community stakeholders (Healey et al., 2014). We frame our paper around the term 'student-staff partnership' to be more specific about the relationships we are focusing on and to emphasise the reciprocal nature of such partnerships, whereby all parties are able to gain from the experience (Cook-Sather, Matthews, Ntem and Leathwick, 2018).

Researchers on student-staff partnerships have highlighted a range of challenges that can stand in the way of developing genuine reciprocal relationships (Bovill, Cook-Sather, Felten, Millard and Moore-Cherry, 2016; Bovill, Cook-Sather and Felten 2011; Matthews et al., 2018c). These include: a lack of knowledge around how to enable student-staff partnerships (Healey et al., 2014), resistance amongst academic staff to stepping outside of traditional roles (Bovill et al., 2016) and the tendency to promote student-staff partnerships through top-down policies (Matthews et al., 2018b). Indeed, in their comprehensive SaP literature review, Mercer-Mapstone et al. (2017) identify that partnerships are 'most frequently implemented at the institutional level', 'outside of a specific discipline' (p.7), and they highlight a lack of 'research illuminating how partnerships translate across disciplines, institutions, countries, and cultures' (p.18). Healey and Healey (2018) also emphasise the context-dependence of partnership work and invite more nuanced accounts from different

contexts. Similarly, other scholars call for deeper 'understanding of disciplinary pedagogies of partnership' (Healey et al., 2014, p. 14), more insights into how practitioners conceptualise partnership (Matthews et al., 2018b), and multiple forms of research and reflection on partnership ideas and practices (Matthews, Cook-Sather and Healey, 2018a).

In this paper, we respond to calls for more contextualised practice-based research that explores how disciplinary perspectives influence curriculum co-creation (Healey and Healey, 2018). We present our experiences as academic staff from diverse disciplinary backgrounds partnering with students in the design of a new undergraduate degree – the Bachelor of Creative Intelligence and Innovation (BCII) at the University of Technology Sydney (UTS).

We have elected to frame our approach to bringing together multiple disciplinary perspectives as transdisciplinary, for four key reasons. Firstly, curriculum co-creation for the supercomplex world (Barnett, 1999) represents a real-world challenge requiring creative responses beyond those tried and tested in mono-disciplinary contexts. Secondly, transdisciplinary approaches highlight the importance of not only disciplinary perspectives (as in interdisciplinary and multi-disciplinary approaches), but also other knowledge types, including local and practical knowledges (Scholz and Steiner, 2015). In the context of student-staff partnerships, we see the practical and contextual knowledge that students bring to curriculum co-creation as an important source of 'non-disciplinary' knowledge. Thirdly, transdisciplinary approaches emphasise mutual learning between a range of participants through deliberate processes of reflexivity – 'on-going scrutiny of the choices that are made when identifying and integrating diverse values, priorities, worldviews, expertise and knowledge' (Polk, 2015, p. 114). Reflexivity plays a central role in transcending knowledge 'silos' to achieve new collective learning. Lastly, the BCII is a transdisciplinary degree itself, with students from diverse disciplinary backgrounds coming together to learn through a focus on real-world challenges and an integration of different knowledges, values and worldviews. Transdisciplinary approaches to higher education have been expanding across a diverse range of contexts over the past decade, including health education (Hudson, 2016), entrepreneurship (Penaluna and Penaluna, 2009) and sustainability education (Evans, 2015).

While we have framed our approach as transdisciplinary, the principles of valuing multiple knowledges and mutual learning are also emphasised in student-staff partnership literature. Indeed, in partnership thinking, differences in knowledge, capabilities and experiences are conceptualised not as 'hindrance' but as 'the foundation of fruitful partnerships' whereby both students and academic staff stand to gain from engaging with different perspectives as 'curious and able learners' (Matthews, 2016, p. 3). Cook-Sather and

Agu (2013) identify knowledge held and created by students as an important resource for faculty learning. de Bie, Marquis, Cook-Sather and Luqueño (2019) argue that partnerships that value student knowledge can create more equitable conceptions of knowing and foster students' willingness to share their knowledge. Similarly, Bovill, Felten and Cook-Sather (2014, p. 4) argue that 'partnership implies a sharing of responsibility, a respect for others' views and a reciprocal relationship'. Without glossing over structural power imbalances, partnership scholars emphasise that if academic staff respect students' capacity to possess expertise that staff can learn from, there is potential for reciprocity and shared responsibility for learning to emerge from student-staff partnerships (Bovill et al., 2011; Matthews et al., 2018b).

In our curriculum co-creation practice we have adopted specific reflexive strategies for encouraging mutual learning proposed by Polk and Knutsson (2008). Specifically, we apply a 'double-loop learning' approach to our curriculum co-creation endeavour to evaluate the assumptions and values that underpin existing rules, strategies and norms, rather than focusing solely on increasing the efficiency of our strategies (i.e. 'single loop learning'). The circular nature of this reflexive process requires us to adopt an adaptive and iterative mindset that facilitates mutual learning (Jantsch, 1972; Max-Neef, 2005).

Our case study brings concepts of student-staff partnership and transdisciplinarity into dialogue through the collaborative creation and adaptation of the BCII final-year curriculum. We highlight how our initial 'participatory-design' process was subsequently reframed and revised through the incorporation of additional perspectives and knowledges through a reflexive process of mutual learning (Polk and Knutsson, 2008). Furthermore, by drawing on different conceptualisations of engagement and partnership from each of our disciplines, experiences and personal values, our mindsets and approaches to partnership were also re-shaped and changed through the collective reflexive processes we undertook. Following the presentation of our case study, we consider its broader relevance for the conceptualisation of student partnerships in higher education.

Introduction to case study

Our case study focuses on the development and implementation of the fourth-year curriculum for the Bachelor of Creative Intelligence and Innovation (BCII). The BCII operates under a double degree model, whereby students undertake intensive BCII subjects for three years

concurrently with their 'core degree' (e.g. in business, science, communications or many other fields), before dedicating their fourth and final year entirely to the BCII program. Throughout the four years of the BCII, a transdisciplinary learning approach is employed based on addressing complex real-world challenges through collaboration and mutual learning across disciplines and with a variety of industry, government and community partners.

We, a team of academic staff coordinating various subjects in the fourth-year BCII program, began engaging in partnerships of curriculum co-creation with students prior to the commencement of the inaugural fourth-year program. This has primarily involved what Bovill and Woolmer (2018) refer to as co-creation *of* the curriculum (e.g. asking students to help refine the structure of subjects they or others will be undertaking in the future), rather than co-creation *in* the curriculum (e.g. students designing assessment tasks as they go). Our partnership processes were adapted progressively over three stages:

1. Initial participatory design sessions: These occurred before and during the inaugural fourth-year program and were framed as participatory design.

2. Incorporating and reflecting on additional knowledges around partnership: This phase drew on transdisciplinarity principles of valuing multiple knowledge types (each of our different disciplinary backgrounds) and reflexivity (how norms, assumptions and worldviews influence our approaches to partnership).

3. Further experimentation on curriculum co-creation: This involved trialling alternative approaches with the second cohort of fourth-year BCII students based on the themes and questions that emerged in stage 2. This kind of dynamic and iterative approach is consistent with partnership principles discussed by Matthews (2016), Cook-Sather and Agu (2013) and de Bie et al. (2019).

Stage 1: Participatory-design sessions with the inaugural fourth-year cohort

The development of the fourth-year BCII program was initially framed as a process of participatory design, drawing on the design background of the inaugural fourth-year coordinator. This approach originated in Scandinavia in the early 1980s in the context of designing new technologies and systems for the workplace. It was based on a democratic ideal that those destined to use systems or artefacts should have a say in their design, and on the principle that participation of skilled users in the design process can contribute to

successful design and high quality products and systems (Ehn and Sjogren, 1991; Muller and Druin, 2002).

The co-creation process of the fourth-year BCII program consisted of a series of participatory design sessions with students and staff (Figure 1), in parallel to an ongoing design process by a core curriculum design team. Furthermore, formative feedback outside of the participatory-design sessions was continuously sought during the delivery of the fourth-year program.
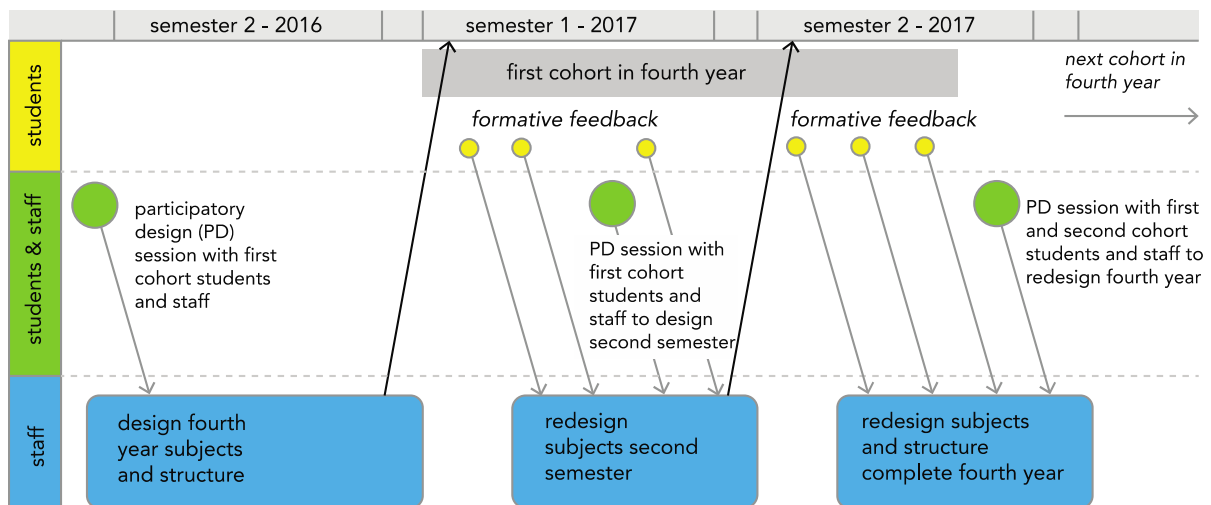

Figure 1. Timeline of the initial co-creation process based on principles of participatory design with the inaugural fourth-year BCII cohort

In the participatory design sessions, we used design tools and methods such as scenarios, deep user insights, and visualisations (Figure 2). The participatory design process provided input for the initial design of the fourth-year program as well as a subsequent redesign of the program. All students were invited to participate in the design sessions, but participation was optional and typically involved 4-6 students (out of 82).

Figure 2. A participatory design session with students and staff. Visualisations are used to represent and reflect on the design of the fourth-year curriculum.

Some elements of the fourth-year program were pre-determined prior to the sessions, such as the subjects students would undertake and the need for a major group project involving industry partners. However, the participatory-design sessions helped to refine aspects of curriculum such as the timing of subjects and projects and where and how learning and project work would take place. For example, the 'redesign' sessions at the end of the first semester resulted in some subjects being offered in a shorter and more intensive format to avoid having multiple group projects running concurrently. Some teaching sessions were also taken outside of the studio space and made into 'electives' and students helped to refine the topics covered in these sessions (e.g. entrepreneurship, sustainability, research skills).

Stage 2: Incorporating and reflecting on additional knowledges

At the conclusion of the inaugural fourth year, we reviewed our student co-creation processes using a double-loop learning approach (Polk and Knutsson, 2008). This involved evaluating not only whether the participatory-design process was effective at engaging students, but also how our notions of student co-creation were influenced by our values, assumptions and worldviews and how these might have changed over time. One realisation from this process was that we each came from different disciplinary backgrounds with different traditions of seeking to engage diverse perspectives (including input from non-experts). As such, we resolved to document and share how such processes have been framed

in each of our disciplines. This material was then used to inform the next phase of student curriculum co-creation, which involved a co-creation session with the second cohort of BCII fourth-year students in mid-2018, part-way through their fourth-year program.

Our four disciplinary perspectives on partnership and co-creation are presented below, along with the questions this process raised for engaging in partnerships of curriculum co-creation.

Mieke (inaugural fourth year coordinator): Participatory design

With a background in human-centred design, I have framed my approach to student partnership in the design of the fourth year as participatory design. Participatory design sits in the broader field of human-centred design, a group of methods and principles aimed at supporting the design of useful, usable, pleasurable and meaningful products or services for people. The main principle of these methods is that they describe how to gain and apply knowledge about human beings and their interaction with the environment, to design products or services that meet their needs and aspirations (for an overview see van der Bijl - Brouwer and Dorst, 2017). Participatory design gained popularity in the human-centred design field because there was a perceived gap between research about users on the one hand and designers doing something with this research on the other (Wixon, 2003). The underlying principle of participatory design is that it aims to close this gap by bringing the worlds of users and designers together, in which the users participate in the designer's world and/or designers participate in the user's world (Muller and Kuhn, 1993; Sanders and Stappers, 2008). Over the last decade, design has become a popular approach in business and public and social innovation – often called 'design thinking', and has also made its way into educational and instructional design (Könings, Seidel, & van Merriënboer, 2014). My experience in the domain of design for social innovation was one of the reasons I chose to start experimenting with the application of participatory design in education and in the design of the BCII fourth year.

Table 1. Questions arising from reflection on participatory design perspective.

Issue, principle or framing	Emergent questions around student-staff partnerships in fourth-year BCII
Creating a community of trust, reciprocity and continuous mutual learning	How do we foster relationships that support an iterative and continuously evolving participatory design process of codetermination, which, preferably, starts before the 4th year?
Conflict as a resource	How do we promote a culture within the cohort and staff and industry stakeholders where conflict is seen as a learning opportunity, highlighting that different perspectives, disagreement, heterogeneity or contradictions can be an important resource for innovation and creativity?
Valuing mistakes as a resource for learning	How do we support staff and students to embrace mistakes and errors as part of the innovation process? Can we create an evaluation / assessment system that allows or even encourages errors and risk-taking?

Giedre: Partnership in higher education

As a team member working on the educational design of the BCII degree, this collective reflexive process allowed me to examine assumptions implicit to the dominant ways to conceptualise students in higher education. Participatory approaches, though becoming increasingly popular now, do not sit easily within higher education, which has inherent power differentials embedded in its systems and practices (Cook-Sather and Alter, 2011).

Historically, higher education system has been exclusionary, positioned to serve the needs and aspirations of elites, with the shift to mass higher education as a nation-building project occurring only during the mid-20th century (Collini, 2012). Despite the political rhetoric about the emancipatory promise of education, the role of higher education in the reproduction of established (and often unjust) societal structures, where those in less privileged positions are afforded inequitable or diminished opportunities, is well-documented (Gale and Parker, 2014). Uneven power relationships are also functionally entwined with educational micro-practices with a clear distinction in the positioning of teachers, the knowers, and students, those who are to be taught (Cook-Sather and Alter, 2011).

Proponents of progressive, radical and critical pedagogies at various historical times challenged such inequalities and advocated for the shift in power balance in the classroom and for students' ability to determine aspects of their education (Bovill & Bulley, 2011). In particular, students' radical demands and participation in the political unrest in the 60s led to an overhaul of universities' curriculum and the emergence of new areas of study, such as gender studies, and the diversification of the student and staff body in terms of race, gender and ethnicity (Barker, 2008). Despite these shifts, the practices and structures of mainstream higher education institutions have not been substantially transformed to become more egalitarian or participatory.

Though the power relationships have shifted with the marketisation of the higher education sector that positioned students as consumers and universities as service providers (Matthews et al., 2018b), it could be argued that the agenda for learning from students' perspectives in the neoliberal paradigm has narrowed down (Zepke, 2018). The notable exception is the student-staff partnerships paradigm that is conceptualised as a counter-narrative to both traditional and neoliberal views of education (Matthews et al., 2018b).

Table 2. Questions arising from reflection on higher education perspective.

Issue, principle or framing	Emergent questions around student-staff partnerships in fourth-year BCII

Power inequalities	Who initiates and sets the agenda for curriculum co-creation? How is the power imbalance managed and what mechanisms are in place to level out the playing field?
Agency through activism	What is the role of activism or rebellion in co-creation processes? Should there be space for resistance, protest, revolt or even anarchy in educational contexts? Do participatory processes 'tame' the risks and extinguish opportunities for students to take matters in their own hands?
Dialogue	How are various perspectives considered and how are decisions made (e.g. deliberation and consensus, majority voting, educators make decisions informed by students' wishes, etc)?

Alex: Participatory approaches to natural resource management

My background in environmental management and rural social research influences the way I approach stakeholder partnerships, particularly through notions of co-management and community-based natural resource management (CBNRM). These approaches emerged in the 1970s in response to concerns about local needs being ignored under centralised and coercive approaches to conservation (Dressler et al., 2010), which tend to be ineffective in complex socio-ecological systems characterised by high levels of uncertainty, non-linear change, self-organisation and multiple knowledge types (Armitage, Berkes and Doubleday, 2007).

The term co-management was first applied to NRM in the early 1990s with Berkes, George and Preston (1991, p. 12) defining it as 'the sharing of power and responsibility between the government and local resource users'. Co-management may involve formal arrangements such as between Traditional Owners and national parks agencies (Ross, et al.,

2009), but it can manifest in less formal ways (Carlsson and Berkes, 2005). Co-management has evolved over time through the addition of new knowledge, the emergence of bridging organisations linking stakeholder groups, a recognition of social learning and a focus on adaptation (Berkes, 2009). 'Adaptive co-management' frames management actions as collaborative experiments that allow future management to be refined through an iterative process of social or mutual learning (Armitage, Marschke and Plummer, 2008).

CBNRM overlaps with co-management, but typically focuses less on power-sharing and more on assisting local communities to set their own priorities and access resources (Dressler et al., 2010). While promoting agency amongst local stakeholders has been cited as a specific objective of CBNRM (Measham and Lumbasi, 2013), power differentials and exclusionary practices can present challenges (Dressler et al., 2010). Participatory rural appraisal emerged in the early 1990s as a method for empowering disadvantaged groups by increasing their role in problem-framing (Chambers, 1994), including local stakeholders partnering with researchers to act as interviewers rather than simply as research subjects.

The use of technology is an emerging area where issues of agency, power and exclusion have been observed. Participatory mapping can enhance agency of local stakeholders, but this may be limited where experts are relied upon to facilitate the process, community members with important knowledge are excluded by a lack of technological literacy or data is presented in a manner that pre-determines relevant 'problems' (Ramsey, 2009). The emergence of 'neogeography' offers the potential to democratise mapping processes, but this has also been criticised for given preference to the participation of stakeholders who are wealthy, well-educated and male (Haklay, 2013).

Table 3. Questions arising from reflection on natural resource management perspective.

Issue, principle or framing	Emergent questions around student-staff partnerships in fourth-year BCII
Framing of participation as 'co-management'	Could co-creation be reframed as co-management to imply an ongoing management role for students, not just a role in the design phase?

Inclusive and equitable participation	Is there a need for more equitable selection processes for students involved in participatory-design/management?
Technology/ communication methods	Do choices around technologies for partnership preference some students over others?

Susie: Socially-engaged art

Influenced by my background and experience in creating, researching and participating in socially engaged art, my approach to student-staff partnerships in higher education is informed by multi-sensory modes of co-creation with an activist and social justice orientation. Socially engaged art is a loose concept that refers to artistic practice that emphasises human engagement and relations (Kester, 2011); with the process of engagement, and changes it may mobilise, typically viewed as having greater, or equivalent, importance to any resulting artworks (Thompson, 2012).

The term emerged in the mid-1970s and has been later elaborated, and debated, by artists, curators, scholars and educators (Bishop, 2006; Helguera, 2011; Kester, 2011; Thompson, 2012) – also referred to as social practice (art) amongst other terms (see Bishop, 2006). It is not defined by a particular medium, such as sculpture, painting, video, film, new media, and performance, but rather works across different materialities, with people and human relations constituting key components of the artworks. For example, the curator Nato Thompson states, socially engaged art is 'defined by an active engagement with groups of people in the world' (2012, p. 18). For the purposes of this brief discussion, I will focus on what the artist and educator Pablo Helguera (2011, p. 35) describes as the 'double-function' of social-engaged art: simultaneously working with communities in the pursuit of social justice, and making 'work that ironizes, problematizes, and even enhances tensions around those subjects, in order to provoke reflection'.

For Helguera (2011, p. 5), one of the ways in which socially engaged art problematises concerns is 'by attaching itself to subjects and problems that normally belong to other disciplines, moving them temporarily into a space of ambiguity'. In particular, this 'temporary snatching' of issues, people and relations into art practices can offer 'new insights to a particular problem or condition and in turn makes it visible to other disciplines'. (Helguera 2011, p. 5). Shannon Jackson (2011, p. 93) also emphasises the capacity of social engaged art to provoke reflection and refers to it as a form of 'trespassing', rather than snatching. Jackson (2011, p. 93) writes, 'it is of course in that trespassing that art makes different zones of the social available for critical reflection'. Whether one refers to it as snatching or trespassing, this process of recontextualisation through art has the capacity to amplify visibility of different concerns and encourage critical reflection on the structures that support social justice, and for whom.

Table 4. Questions arising from reflection on socially-engaged art perspective.

Issue, principle or framing	Emergent questions around student-staff partnerships in fourth-year BCII
Temporary snatching	How can art help make the familiar strange and/or ambiguous, to offer up aspects of the learning experience to critical reflection?
Multi-sensory experiences	In what ways can the creation of multi-sensory experiences, through both material and ephemeral means, facilitate communities of practice/learning?
Trespassing	How might students be encouraged to actively critique the learning and teaching experience to enhance their, and our, learning?

Combining disciplinary perspectives on partnership

After sharing our different disciplinary perspectives on partnership, we came together again to reflect on what we had learnt together through this process (see individual reflections in the Supplemental Online Material) and to categorise our key questions around a series of 'nodes' (Figure 3). The four nodes that emerged through this process were: (1) Impact, (2) Tools/Methods/Practice, (3) Roles/Positions and (4) Learning Together.
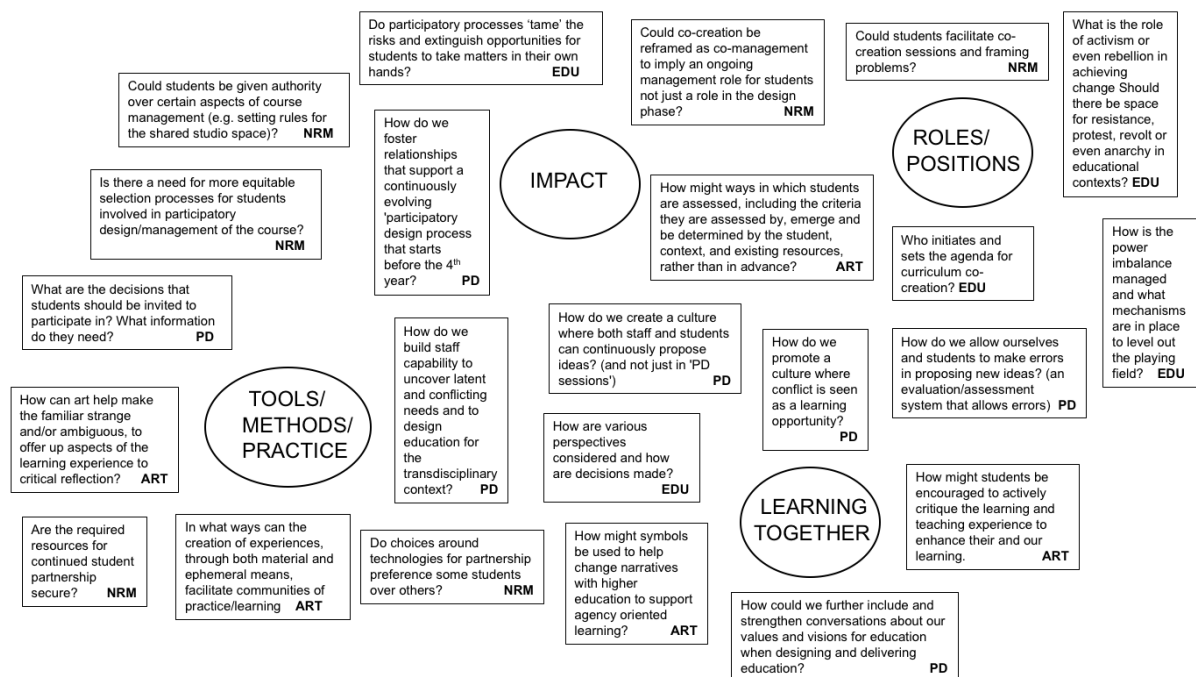

Figure 3. Nodes identified around which we clustered our key questions. The fields from which each question originated are shown in the bottom-right corner of each box.

Sharing our different disciplinary perspectives and aspects of the legacies that inform these approaches brought into focus the common histories that connect across these disciplinary domains. Our collaborative exploration of various histories and their connections across disciplines challenged our assumptions that the methods and frameworks we have previously used are specifically rooted in and only relevant to our own disciplines.

The time frame of the various disciplinary approaches seeking diverse perspectives emerged as an important issue through our reflection. Participatory design emphasises the design phase over examining artefacts in the contexts of their use. Similarly, many socially-engaged art projects tend to adopt an interventionist framing of one-off rather than sustained

interactions with audiences. Conversely, natural resource management often emphasises ongoing co-management. Based on these reflections we questioned how student involvement in curriculum co-creation should be framed – as one-off co-creation of curriculum or as ongoing partnership in the co-management of it?

The process of first writing our individual sections separately and then comparing them together revealed absences in what we chose to highlight from our respective disciplines. For example, an observation of the central role that Giedre and Susie assigned to the notion of agency afforded to constituent groups caused Alex to reflect more deeply on the role of environmental co-management in enabling agency within communities. In turn, reflecting on the natural resource management perspective, Giedre commented on the relative absence of 'any consideration for the environment and the planet we live on' in mainstream educational research, which typically focuses on societal injustices and inequalities.

Agency of constituent groups and diversity were central themes across our different reflections. Giedre reflected on how existing power relationships could be 'temporarily suspended' through partnerships by drawing on Susie's discussion on 'trespassing' in socially-engaged art. Rather than considering certain approaches as essential to developing curriculum co-creation approaches, Mieke reflected on the need to 'work with what we have' to share and learn from practices adopted by others involved in a partnership.

Stage 3: Further experimentation on curriculum co-creation

Based on our reflexive exploration of disciplinary perspectives, we revised our curriculum co-creation format for the second cohort of fourth-year BCII students. In this new iteration of co-creation we trialled a number of ideas and new approaches with regards to context and setting of co-creation, flexibility of contributions, the notions of student agency and co-management, technologies for participation, and opportunities for creative contributions.

To evaluate how context and setting might influence partnership outcomes, the curriculum co-creation session was held in the students' studio space rather than the faculty building and was formally scheduled in class time (although students could opt out without penalty). Informed by our reflections, we sought to address questions of inclusion and power dynamics, by providing an opportunity for all students to participate on their 'territory'.

Students chose which aspects of curriculum design they would most like to contribute to, with a series of stations set up around the room addressing the themes that emerged through our reflection:

- subject structure (e.g. class times, location, topics, mentors);
- project teams (size and make-up);
- agency and creativity (ideas for facilitating them in the curriculum);
- co-management (e.g. setting rules for the studio space, organising guest presenters, mentors and events);
- creativity station (opportunity for creative contributions e.g. to draw or create clay models); and
- online station (using an online tool for contributing ideas – including after the end of the face-to-face co-creation session).

Headcounts were made periodically to assess the popularity of different stations. Overall, 73 of 96 students were present and the average number actively participating at any one time was 38. Of the stations, the one focussed on the subject structure was the most popular, followed by project teams and then agency. The co-management and creativity stations had low student participation and the online station had zero participation, but this could be due to the open framing of the creative contributions and lack of familiarity with co-management, rather than a lack of interest. The trialling of this revised curriculum co-creation methodology indicated that students were most comfortable contributing to how their classes and project work was structured. Drawing on this experience, we identified the following priority areas for further experimentation:

- **Context and setting of co-creation:** Finding the right settings to maximise inclusion that integrate the choice for students to opt out.
- **Agency, activism and emergence:** Best ways to leave space in the curriculum for student agency and unexpected outcomes to emerge.
- **Assessment:** Opportunities to co-create assessment tasks that support staff and students to value errors, enable students to set criteria for success, and encourage mutual learning between students, staff and other stakeholders.
- **Creative participation:** Alternative approaches could succeed in bringing new perspectives and stimulating ideas.
- **Technology:** Exploring whether students did not want to contribute to curriculum co-creation via an online platform or if the platform chosen was unsuitable for the task.

Aside from the specific refinements above, we also feel that we could do more to incorporate Bovill and Woolmer (2018) notion of co-creation *in* the curriculum (e.g. developing opportunities for students to design their own assessment tasks). Through engagement with partnership literature we have also identified the need to refine our reflexive processes of evaluating norms, assumptions and worldviews to include students and industry partners in a process of 'co-reflexivity' (Kahn, 2014), which we have since carried out in partnership with students (Kligyte et al., 2019).

Concluding remarks

The curriculum co-creation process outlined in our case study has evolved over time and will continue to evolve through our partnerships with students, guided by the transdisciplinary principles of reflexivity and mutual learning. The potential value of the approach discussed in this paper is precisely that it does not present a 'one-size-fits-all' generic model of 'best practice' divorced from its context, which Healey and Healey (2018) caution against. The potential to tailor transdisciplinary approaches to different contexts aligns well with the strengths of student-staff partnership approaches, which Healey et al. (2014, p. 55) argue 'lies less in the emulation of existing work' than in the creation of possibilities 'that have not yet been experienced or even imagined'.

Through this paper, we have highlighted that curriculum co-creation practices can be enriched through engagement with diverse disciplinary perspectives, particularly through an exploration of historical shifts towards partnership in various disciplines. Greater recognition of these existing disciplinary partnership practices and strategies for reflexive learning from them may be one strategy for overcoming 'resistance' to partnership approaches amongst academics (Bovill et al., 2016).

We agree with Bovill et al. (2016) that student-staff partnership practices are best considered as situated context-specific processes of co-creation. We conceptualise partnerships as emerging from the context of practice and the various knowledges present in them, whereby 'all parties have something to bring to the table' (Healey & Healey, 2018, p. 5). Thus, we propose that what is needed is not an 'off the shelf' partnership solution, but rather a disposition and commitment to mutual learning and the valuing of multiple knowledge types by all parties involved in a partnership – aligned with the central principles of trandisciplinarity and student-staff partnership. Through an engagement with these principles, we have created a framework for the BCII curriculum that is being re-made and

re-assembled with each iteration of co-creation drawing on the various knowledges available. Using this approach, future staff, students and other partners can collaborate, adapt and learn together – addressing the complexities of the specific contexts they are working in by drawing on multiple sources of knowledge. The value of working with the concepts of student-staff partnership and transdisciplinarity, together, is that this allows for such partnerships to be conceptualised as dynamic processes that are evolving, collaborative, reciprocal, context-specific and open to new insights. It simultaneously emphasises the diversity of different knowledge types available and the need for reflexive processes to enable mutual learning.

References

Armitage, D., Berkes, F., and Doubleday, N. (2007). Adaptive Co-Management and Complexity: Exploring the Many Faces of Co-Management in D. Armitage, F. Berkes, and N. Doubleday, (eds.), *Adaptive Co-Management* (pp. 1-15). Vancouver: UBC Press.

Armitage, D., Marschke, M., and Plummer, R. (2008). Adaptive co-management and the paradox of learning. *Global Environmental Change*, 18(1), 86-98. https://doi.org/10.1016/j.gloenvcha.2007.07.002

Barker, C. (2008). Some reflections on student movements of the 1960s and early 1970s. *Revista Crítica de Ciências Sociais*, 81, 43-91.

Barnett, R. (1999). *Realizing the university*. McGraw-Hill Education (UK).

Bergmark, U., & Westman, S. (2016). Co-creating curriculum in higher education: promoting democratic values and a multidimensional view on learning. *International Journal for Academic Development*, 21(1), 28-40. https://doi.org/10.1080/1360144X.2015.1120734

Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management*, 90(5), 1692-1702. https://doi.org/10.1016/j.jenvman.2008.12.001

Berkes, F., George, P., and Preston, R. (1991). Co-management: the evolution of the theory and practice of joint administration of living resources. In Procedings of the *Second Biennial Conference of the International Association for the Study of Common Property,* Winnipeg, Canada, 26-29 September 1991.

Bernstein, J. H. (2015). Transdisciplinarity: A Review of Its Origins, Development, and Current Issues. *Journal of Research Practice* 11(1)*.* http://jrp.icaap.org/index.php/jrp/article/view/510/412

Bishop, C. (2006). The Social Turn: Collaboration and Its Discontents. *Artforum* (February), 179-185.

Bovill, C. (2013). Students and staff co-creating curricula – a new trend or an old idea we never got around to implementing? In C. Rust (Ed.), *Improving learning through research and scholarship: 20 years of ISL* (pp. 96-108). Oxford, UK: The Oxford Centre for Staff and Educational Development.

Bovill, C. & Bulley, C.J. (2011). A model of active student participation in curriculum design: Exploring desirability and possibility. In Rust, C. (ed.) *Improving Student Learning (ISL) 18: Global Theories and Local Practices: Institutional, Disciplinary and Cultural Variations* (pp. 176-188). Oxford Centre for Staff and Learning Development: Oxford.

Bovill, C., Cook-Sather, A., & Felten, P. (2011). Students as co-creators of teaching approaches, course design and curricula: Implications for academic developers. *International Journal for Academic Development*, 16(2), 133-145.

Bovill, C., Felten, P. and Cook-Sather, A. (2014) Engaging students as partners in learning and teaching (2): Practical guidance for academic staff and academic developers. In: ICED Conference 2014: *Educational Development in a Changing World*, Stockholm, Sweden, 16-18 June 2014.

Bovill, C., Cook-Sather, A., Felten, P., Millard, L., and Moore-Cherry, N. (2016). Addressing potential challenges in co-creating learning and teaching: overcoming resistance, navigating institutional norms and ensuring inclusivity in student–staff partnerships. *Higher Education*, 71(2), 195-208.

Bovill, C. & Woolmer, C. (2018). How conceptualisations of curriculum in higher education influence student-staff co-creation *in* and *of* the curriculum. *Higher Education*, 2018.

Carlsson, L., and Berkes, F. (2005). Co-management: concepts and methodological implications. *Journal of Environmental Management*, 75(1), 65-76. https://doi.org/10.1016/j.jenvman.2004.11.008

Chambers, R. (1994). The origins and practice of participatory rural appraisal. *World Development*, 22(7), 953-969. https://doi.org/10.1016/0305-750X(94)90141-4

Collini, S. (2012). *What are universities for?* London: Penguin

Cook-Sather, A., and Alter, Z. (2011). What Is and What Can Be: How a Liminal Position Can Change Learning and Teaching in Higher Education. *Anthropology & Education Quarterly*, 42(1), 37-53. https://doi.org/10.1111/j.1548-1492.2010.01109.x

Cook-Sather, A., and Agu, P. (2013). Students of Color and Faculty Members Working Together Toward Culturally Sustaining Pedagogy. *To Improve the Academy*, 32. 271-285. https://doi.org/10.1002/j.2334-4822.2013.tb00710.x

Cook-Sather, A., Bovill, C. and Felton, P. (2014). *Engaging Students as Partners in Learning and Teaching: A Guide for Faculty*. San Francisco: Jossey-Bass

Cook-Sather, A., Matthews, K. E., Ntem, A., and Leathwick, S. (2018). What we talk about when we talk about Students as Partners. *International Journal for Students As Partners*, 2(2), 1-9. https://doi.org/10.15173/ijsap.v2i2.3790

de Bie, A., Marquis, E., Cook-Sather, A. and Luqueño, L. (2019). Valuing Knowledge(s) and Cultivating Confidence: Contributions of Student–Faculty Pedagogical Partnerships to Epistemic Justice. In J. Hoffman, P. Blessinger , M. Makhanya (eds) *Strategies for Fostering Inclusive Classrooms in Higher Education: International Perspectives on Equity and Inclusion* (pp.35 – 48). Innovations in Higher Education Teaching and Learning Volume 16, Emerald Publishing Limited.

Dressler, W., Büscher, B., Schoon, M., Brockington, D. A. N., Hayes, T., Kull, C. A., McCarthy, J., and Shrestha, K. (2010). From hope to crisis and back again? A critical history of the global CBNRM narrative. *Environmental Conservation*, 37(1), 5-15. https://doi.org/10.1017/S0376892910000044

Ehn, P., and Sjogren, D. (1991). From system descriptions to scripts for action in J. Greenbaum and M. Kyng, (eds.), *Design at work: cooperative design of computer design* (pp. 241-268). Hillsdale, New Jersey: Lawrence Erlbaum associates.

Evans, T. L. (2015). Transdisciplinary collaborations for sustainability education: Institutional and intragroup challenges and opportunities. *Policy Futures in Education*, 13(1), 70-96. https://doi.org/10.1177/1478210314566731

Gale, T. and Parker, S. (2014) Navigating change: a typology of student transition in higher education. *Studies in Higher Education*, 39(5), 734-753, http://doi.org/ 10.1080/03075079.2012.721351

Gregory, J. (2003). Scandinavian approaches to participatory design. *International Journal of Engineering Education*, 19(1), 62-74.

Haklay, M. (2013). Neogeography and the Delusion of Democratisation. *Environment and Planning A*, 45(1), 55-69. https://doi.org/10.1068/a45184

Healey, M., & Healey, R. (2018). 'It depends': Exploring the context-dependent nature of students as partners practices and policies. *International Journal for Students as Partners*, 2(1), 1-10. https://doi.org/10.15173/ijsap.v2i1.3472

Healey, M., Flint, A., and Harrington, K. (2014). *Engagement through partnership: Students as partners in learning and teaching in higher education*. The Higher Education Academy, York.

Helguera, P. (2011). Education for Socially Engaged Art, New York: Jorge Pinto Books.

Hudson, D. L. (2016). Popular Culture and Public Health: A Fresh Approach to Transdisciplinary Public Health Education. *Pedagogy in Health Promotion*, 2(4), 251-255. https://doi.org/10.1177/2373379916650691

Jackson, S. (2011). *Social Works: Performing Art, Supporting Publics*, New York: Routledge.

Jantsch, E. (1972). Towards interdisciplinarity and transdisciplinarity in education and innovation in L. Apostel, G. Berger, A. Briggs, and G. Michaud, (eds.), *Interdisciplinarity, problems of teaching and research in universities* (pp. 97-121). Paris: OECD Publications.

Kahn, P. E. (2014). Theorising student engagement in higher education. *British Educational Research Journal*, 40(6), 1005-1018. https://doi.org/10.1002/berj.3121

Kester, G. H. (2011). *The one and the many: Contemporary collaborative art in a global context*. Durham: Duke University Press.

Kligyte, G., Baumber, A., van der Bijl-Brouwer, M., Dowd, C., Hazell, N., Le Hunte, B., Newton, M., Roebuck, D. and Pratt, S. (2019 in press). 'Stepping in and stepping out': Enabling creative third spaces through transdisciplinary partnerships. *International Journal for Students as Partners, 3(1)*.

Könings, K.D., Seidel, T., & van Merriënboer, J.J.G. (2014). Participatory design of learning environments: integrating perspectives of students, teachers, and designers. *Instructional Science*, 42(1), 1-9

Lubicz-Nawrocka, T. M. (2018). Students as partners in learning and teaching: The benefits of co-creation of the curriculum. *International Journal for Students As Partners*, 2(1), 47-63. https://doi.org/10.15173/ijsap.v2i1.3207

Matthews, K. (2016). Students as partners as the future of student engagement. *Student Engagement in Higher Education Journal*, 1(1).

Matthews, K. E., Cook-Sather, A., and Healey, M. (2018a). Connecting learning, teaching, and research through student-staff partnerships: toward universities as egalitarian learning communities in V. Tong, A. Standen, and M. Sotiriou, (eds.), *Shaping higher education with students: ways to connect research and teaching)*. London: University College of London Press.

Matthews, K. E., Dwyer, A., Hine, L., and Turner, J. (2018b). Conceptions of students as partners. *Higher Education*. https://doi.org/10.1007/s10734-018-0257-y

Matthews, K. E., Cook-Sather, A., Acai, A., Dvorakova, S. L., Felten, P., Marquis, E. and Mercer-Mapstone, L. (2018c). Toward theories of partnership praxis: an analysis of interpretive framing in literature on students as partners in teaching and learning. *Higher Education Research & Development*, 1-14. https://doi.org/10.1080/07294360.2018.1530199

Max-Neef, M. A. (2005). Foundations of transdisciplinarity. *Ecological economics*, 53(1), 5-16. https://doi.org/10.1016/j.ecolecon.2005.01.014

Measham, T. G., and Lumbasi, J. A. (2013). Success Factors for Community-Based Natural Resource Management (CBNRM): Lessons from Kenya and Australia. *Environmental Management*, 52(3), 649-659. http://doi.org/10.1007/s00267-013-0114-9

Mercer-Mapstone, L., Dvorakova, S. L., Matthews, K., Abbot, S., Cheng, B., Felten, P., Knorr, K., Marquis, E., Shammas, R., and Swaim, K. (2017). A Systematic Literature Review of Students as Partners in Higher Education. *International Journal for Students As Partners*, 1(1), 1(1). https://doi.org/10.15173/ijsap.v1i1.3119

Muller, M., and Druin, A. (2002). Participatory Design: The Third Space in HCI in J. A. Jacko, (ed.), *The Human-Computer Interaction Handbook* (pp. 1125-1154). Hillsdale, NJ: Lawrence Erlbaum Associates.

Muller, M. J., and Kuhn, S. (1993). Participatory design. *Communications of the ACM*, 36(6), 24-28.

Nicolescu, B. (1997). The Transdisciplinary Evolution of Learning. In Proceedings of the International Congress on What University for Tomorrow? *Towards a Transdisciplinary Evolution of the University*, Locarno, 30 April-2 May 1997, 1-11. http://www.learndev.org/dl/nicolescu_f.pdf

Penaluna, A., and Penaluna, K. (2009). Creativity in Business/Business in Creativity: Transdisciplinary Curricula as an Enabling Strategy in Enterprise Education. *Industry and Higher Education*, 23(3), 209-219. http://doi.org/10.5367/000000009788640314

Polk, M. (2015). Transdisciplinary co-production: Designing and testing a transdisciplinary research framework for societal problem solving. *Futures*, 65, 110-122. https://doi.org/10.1016/j.futures.2014.11.001

Polk, M., and Knutsson, P. (2008). Participation, value rationality and mutual learning in transdisciplinary knowledge production for sustainable development. *Environmental Education Research*, 14(6), 643-653. https://doi.org/10.1080/13504620802464841

Prager, K., and Vanclay, F. (2010). Landcare in Australia and Germany: comparing structures and policies for community engagement in natural resource management. *Ecological Management & Restoration*, 11(3), 187-193. http://doi.org/10.1111/j.1442-8903.2010.00548.x

Ramsey, K. (2009). GIS, modeling, and politics: On the tensions of collaborative decision support. *Journal of Environmental Management*, 90(6), 1972-1980. https://doi.org/10.1016/j.jenvman.2007.08.029

Ross, H., Grant, C., Robinson, C. J., Izurieta, A., Smyth, D., and Rist, P. (2009). Co-management and Indigenous protected areas in Australia: achievements and ways forward. *Australasian Journal of Environmental Management*, 16(4), 242-252. http://doi.org/10.1080/14486563.2009.9725240

Sanders, E. B.-N., and Stappers, P. J. (2008). Co-creation and the New Landscapes of Design. *CoDesign*, 4(1), 5-18. https://doi.org/10.1080/15710880701875068

Scholz, R., and Steiner, G. (2015). The real type and ideal type of transdisciplinary processes: part I—theoretical foundations. *Sustainability Science*, 10(4), 527-544. https://doi.org/10.1007/s11625-015-0326-4

Thompson, N. (2012). Living as Form in N. Thompson, (ed.), *Living as Form: Socially Engaged Art From 1991-2011*. Cambridge Mass: MIT Press.

van der Bijl - Brouwer, M., and Dorst, K. (2017). Advancing the Strategic Impact of Human-Centred Design. *Design Studies*, 53, 1-23. https://doi.org/10.1016/j.destud.2017.06.003

Wixon, D. (2003). Evaluating usability methods, why the current literature fails the practitioner. *Interactions*, 10(4), 28-34.

Zepke, N. (2018). Student engagement in neo-liberal times: what is missing? *Higher Education Research & Development*, 37(2), 433-446. https://doi.org/10.1080/07294360.2017.1370440