Learning to be a "Transdisciplinary" Sustainability Researcher: A Community of Practice Approach

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This paper utilises a 'community of practice' model to reflect on the post-graduate research program at the Institute for Sustainable Futures, UTS. Our work at the Institute involves resolution of complex problems in today's society, a task which requires insights generated through multiple disciplines. Over the last five years we have conducted an evolving program of activities for our post-graduate students to equip them with the necessary skills for this challenge. This program has been transformational for both individuals and the group, which now operates as a cohesive, mutually learning team. In this paper we look to the 'community of practice' model as a critical lens to examine our program and assist in identifying new opportunities to improve our approach to transdisciplinary research training.

Background and introduction

The purpose of this paper is to use the model of communities of practice as a lens for reflecting on our evolving transdisciplinary postgraduate program. Our program has developed organically, drawing on diverse inputs and built up through action research cycles that have responded to voiced and observed needs of the students. We believe the program to be comprehensive and working well for students and supervisors alike, and are looking for a theoretical frame to guide its further development and encourage translation by others. In this paper we utilise the 'communities of practice' model to provide such a frame.

The Institute for Sustainable Futures (ISF) at the University of Technology Sydney takes as its mission 'to create change towards sustainable futures'. Sustainability throws up the challenges of solving complex real-life problems that transcend traditional disciplinary boundaries and knowledge systems, making a PhD in the area of "sustainable futures" a distinctly challenging journey. Our postgraduate program is small (typically 8-10 students at once) and delightfully diverse, for example at the moment they range from a study of sustainable change in the Australian building industry, to the application of learning theories to international aid utilizing a case study of agricultural reform in Mozambique.

ISF's mission is mirrored in the ideology and action of our research students, and implies a strong change agenda in their research processes. The challenge in this passion is to find the balance between rigour and relevance.

As well as a commitment to create change, the research conducted by the Institute's students seeks to adhere to concepts of transdisciplinarity. Transdisciplinarity differs from multi-disciplinarity and inter-disciplinarity in that it actually calls into question disciplinary knowledge, and attempts to offer ways to articulate between different forms of knowledge (Thompson Klein, 2004). Transdisciplinar-

ity is an emerging field with a slowly forming discourse and theoretical basis. As yet, literature is focused primarily on contending the definition of the term, in search of a coherent identity (Horlick and Jones, 2004; Balsiger, 2004; MaxNeef, 2005), with only a small number of papers reporting on the realities and challenges of conducting such research with integrity (Depres et al., 2004; Bruce et al., 2004), and even fewer attempts to propose evaluative structures (Wickson et al., Bergmann et al, 2005). As such, the guidance available to students venturing into such territory is limited.

A further challenge for our students is find the balance point in their research for their original discipline and/or experience base: it needs to inform and be informed, but neither dominate nor disappear. A dominant original discipline transgresses transdisciplinary intent because it fails to make space for other discourses and epistemological perspectives, whilst a disappearing original discipline probably fails to capture the contributions from the depths of experience, and may suggest a lack of reflective practice, once again transgressing transdisciplinary intent. The integration of knowledge and methodologies from different fields requires our students to question the values and underlying assumptions in their habitual thought processes and modes of perception. In other words they must learn about their own particular epistemological perspective before they can meaningfully engage with new disciplinary fields. As MaxNeef (2005) points out, in transdisciplinary research, 'an integrating synthesis is not achieved through the accumulation of different brains. It must occur inside each of the brains…'

Our post-graduate program has developed since 2001 in response to these challenges, and has transformed our postgraduates from a group of disparate disconnected researchers into a mutually learning team. We now seek to reflect upon this program in the light of 'communities of practice' as a meta-model to guide the program's on-going development. We start below with an introductory description of our activities followed by their analysis in this frame.

Activities of our post-graduate program

Our post-graduate community activities have evolved over time, through action research cycles of "learn, plan, do". They include annual retreats, small peer groups, special workshops and fortnightly roundtables, all coordinated through meetings to plan and reflect on such activities.

Our yearly residential retreats have become a focal point. We began this initiative five years ago with the intent of creating bonds between the disparate individual students. Nowadays, the retreats are coherently themed, and have become the time when we take an intellectual leap together.

The idea for small peer groups for accountability and support (GAS groups) came from the experiences of Kath Fisher and her colleagues (Fisher et al., 1998). The students have mostly decided the size and constitution of GAS groups, based on congruent research areas, personalities and stages in the research process. Each group then articulates the structure and focus of their activities. They also consider how to build reflection into their practice, how their meetings will be facilitated and when to stop and review their outcomes and processes.

The yearly retreat often results in identification of common questions, so we have held a variety of research training workshops, using internal and external experts, covering topics like epistemology and theoretical frameworks, validity frameworks in the social sciences, research writing and focusing on specific methodologies such as Actor Network Theory.

Our final area of endeavour is more typical of postgraduate research training programs generally, and consists of weekly or fortnightly roundtables in which the students present, seek feedback on, or debate issues raised in their research. These provide a forum for interaction with the rest of the Institute (who are involved in research consultancy in sustainability) and keep everyone up to date on developments in each other's thinking and topics.

Communities of practice as a critical lens for reflection
What is a community of practice and why use it as an analytical frame?

The discourse of communities of practice began with Lave and Wenger's work (1991) on the learning processes that occurred within apprenticeships and the way in which the community surrounding an apprentice acts as a living curriculum. They focused on "what kinds of social engagements provide the proper context for learning to take place" (Lave and Wenger, 1991: p14) and described learning as "an evolving, continuously renewed set of relations" (ibid.: 50). Wenger (1998) went on to define the unique characteristics of a community of practice as being "mutual engagement, joint enterprise and shared repertoire", where learning processes focus on the negotiation of meaning through two critical inter-relating processes: reification and participation.

In their work on postgraduate supervision and training, Pearson and Brew (2002) propose the use of communities of practice to conceptualise research communities. They suggest the model would provide insight to the complex social relationships in supervision and research practice and would offer "guidance for the creation of productive learning environments" (p142). In addition, the strongly "situated" nature of our post-graduate students' research and the reification inherent in disciplinary research makes this social learning theory an appropriate frame to analyse and reflect on our practice. Below we begin with Wenger's characteristics of mutual engagement, joint enterprise and shared repertoire, examining how they relate to and might inform our program. We then utilise Wenger's ideas on learning design to provide additional ideas to further our approach.

Mutual engagement

Mutual engagement is dependent on "being included in what matters" (Wenger, 1998: p74). In the context of our community of practice, our challenge was and is to provide multiple opportunities for interaction between the students; to create space for dialogue to occur and relationships to be built and to facilitate this process of mutual engagement. The full range of activities mentioned above has helped serve this purpose, through both occasional intense development spaces (retreats and workshops) and ongoing, 'maintenance' spaces (roundtables and GAS activities). Our annual retreats have been particularly important in achieving what Wenger describes as "a community of practice [that] can become a very tight node of inter-

personal relationships". For example, one student's comment in reflecting upon the retreat was:

"At the broadest (should that be deepest?) level, it was the mental stimulation, journey sharing, reality checking and companionship with a very special bunch of people. To be frank and honest, I may well have decided to discontinue my PhD studies by now if it was not for that sharing. Whilst retreats are many things at many levels, it is this one that is most important to me."

An interesting point Wenger makes about the dynamics and relationships within a community of practice are that they are not necessarily harmonious. Indeed he contends that "disagreement, challenges and competition can all be forms of participation" (ibid: p77). On reflection, it is true that both co-operation and alignment of people's outlooks and approaches as well as dissonance and the voicing of alternative perspectives have shaped our practice and have been essential to our joint negotiation of meaning. The quote below demonstrates how debate triggered a personal realisation of a need to change views from their dominant disciplinary approach (positivist, scientific background) to accommodate the methods they were utilising (born from social sciences):

"What changed for me …? - I now know how I am going to deal with sustainability in my thesis. This change came as a result of Simon's forthright stance and Paul playing back my shrill 'you must have a position on sustainability' decree … I also realised that I will need to disclose my own values (and how they construct/underpin my conception of sustainability)"

The opportunity for us is to focus more on bringing perspectives from beyond the boundary of our group, including those who specifically support views that differ from our own.

Joint enterprise

Our joint enterprise centres on the two aspects of research common to our community of practice: sustainability and transdisciplinarity. According to Wenger joint enterprise is "defined by the participants in the very process of pursuing it". Sustainability and transdisciplinarity are both large, contended realms and thus offer plenty of scope for our community to evolve our own meanings and definitions of these terms. We have used a mixture of participation and reification centred learning approaches, which according to Wenger, are both essential to progressing learning on an issue (Wenger, 1998; p55).

Our pursuit to explore sustainability has resulted in extensive dialogue within our community about its definition, worth and relationship to each student's research. In general, our activities focused on sustainability have focused on participation. Reified forms of this knowledge already exist in the academic literature and the students already spend much time alone in reading and reflecting on these. So what has been important for our community has been to test what this means in our practice, share our experiences and debate variations in our perspectives.

In facing the challenge of conducting transdisciplinary research with little prior exposure to, or experience in such a realm, the students have needed structured exposure to various forms of reified "knowledge' and "competence" in the required skills, as well as participatory activities to trial our use of such materials. During our retreats we have conducted a range of such learning activities. These activities have touched areas of peer review methods and frameworks, development of critical thinking and research writing skills, exploration of epistemological stances, theoretical frames and their influence on research methodologies, and sharing of personal accounts of managing a transdisciplinary PhD journey. The result is that many of the students are now at ease in working across a range of disciplines, demonstrated by reports of two of Chris Reidy's thesis examiners, a leader in futures thinking and a leading environmental academic:

"The candidate has obviously ventured beyond any disciplinary 'comfort zone' and stretched himself to cover the various 'bases' of the chosen methodology."

and,

"I can only say that I am in awe of Chris' abilities in researching and synthesising over this broad field – a breadth which in my view is essential if we are to make progress in sustainable development – but one which few would be game to take on!"

Within the pursuit of a joint enterprise, Wenger refers to the formation of a "communal regime of mutual accountability" (Wenger, 1998: p81) which has a broad definition as follows:

"what matters and what does not, what is important and why it is important, what to do and not to do, what to pay attention to and what to ignore, what to talk about and what to leave unsaid, what to justify and what to take for-granted, and what to display and what to withhold, when actions and artefacts are good enough and when they need improvement or refinement"

Here we examine three types of accountability regimes and how they have played out over time. They are peer evaluation, accountability within GAS groups and our roles as designers of the learning processes as well as participants in the community.

We have initiated forms of peer evaluation at various points in time, and have provided frameworks to the students to inform such evaluation. While some students have taken up this practice, particularly in their GAS groups, for others it is not yet a habitual activity. This provides a challenge for us to develop new ways and means to embed peer evaluation in our practice.

The accountability regime established in the GAS groups has turned out to be broader than we had first anticipated. We had initially understood the idea of accountability in these groups to mean that the students would hold each other accountable for progress or completing tasks in their studies. In reality, this kind of accountability has not been a strong focus in the groups. Instead the review proc-

esses for these groups revealed mutual support and sharing of their ideas with one another as the established "accountability regime". For example the needs and benefits voiced by the students included emotional support, social contact, a reduced sense of isolation, development of trust between students, motivation to get things done, validation, and sharing of the journey. In addition, at an intellectual level, the students noted the value of peer validation and critique. Accountability for progress in their work instead features more predominantly in the supervisor-student relationships.

Our own role within the community of practice rests on a balance between leadership and participation. Wenger mentions the establishment of different roles within a joint enterprise, such that the responsibility of different parties becomes implicit and understood (Wenger, 1998: p81). This is something visible with regard to our role in guiding the community of practice, and initially we were much relied upon to lead the group. However, as Wenger states, "the defining of a joint enterprise is a process, not a static agreement" (ibid: p82). Indeed we now have moved to a different dynamic in which the students take greater responsibility within the community. For example at the last retreat, the structured sessions were both planned and led by the students.

Shared repertoire

A shared repertoire defines the "resources for negotiating meaning" (Wenger, 1998: p82). One of the outcomes of the series of retreats and our other activities has been the building of a shared language and understanding about our endeavours. Concurrently, we are indeed creating a growing set of resources generated to utilise useful tools invested by others, and to summarise and synthesise the thoughts which we have crystallised together. Some examples are a set of critical thinking resources, a framework for reviewing research writing (the meta, macro, micro framework), an evolving document covering different epistemologies and theoretical frameworks, documented reflections of our retreat and the GAS groups, and documented tips and tricks to doing a PhD ("The accumulated wisdom of ISF PG students"). The most recent addition is an emerging paper on what constitutes quality in transdisciplinary research. This paper demonstrates new intellectual advances in transdisciplinarity by engaging both with theory and with the constraints and practicalities of conducting such research. Wenger's focus on creating a shared repertoire reminds us that it will be important to keep persisting with the effort to document such new developments within the thinking of our community.

Informing our design of future learning activities

Wenger presents a framework for guiding the design of social learning processes, with the caution that "learning cannot be designed", that it "moves on its own terms. It slips through cracks; it creates its own cracks." (Wenger, 1998: p225). His conceptual framework suggests a focus on three elements: engagement, imagination and alignment (Wenger, 1998: p237).

In examining his framework, some opportunities for future directions in our community arise. Under engagement we are reminded of the importance of "peripherality" (ibid: p237) and the need for our community to look outwardly as

well as inwardly in order to keep our practice "current". This area also directs us to consider ways to create "continuity" (ibid, p238) such as through ensuring encounters between different generations or cohorts of our students. Within the concept of imagination, we might consider activities that allow us to locate our own meanings within a larger context, and to push boundaries through visioning exercises. A focus on alignment and infrastructure to support alignment would likely help us converge again on our common purpose, and think consciously about how we coordinate and jurisdict our processes.

Conclusion

In conclusion, there are important lessons to be learnt through reflecting on our activities through the lens of communities of practice. These lessons stand us in good stead to continue to develop new ways to embed the skills for transdisciplinary research in our students. In addition, it becomes clear that the 'community' we have created has been an essential ingredient in broadening the perspective of our students, such that they are able to engage and achieve integration across different disciplines meaningfully.

Finally, the 'communities of practice' model has provided a means for us to describe elements of our program in a coherent way such that the ideas may be transferred to other settings. The community of practice model could likely offer other research training programs important additional dimensions. Indeed interpretivist researchers report on the need for "apprenticeship" to learn the required competences in interpretivist research (Angen, 2000). The approach could also be useful to a wider set of activities that require people to cross disciplinary boundaries and backgrounds.

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Acknowledgements

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