



Interruption, interrogation, integration and interaction as process: How PNS informs interdisciplinary curriculum design

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ABSTRACT

We focus on the decision to include PNS in the curriculum for a first year tertiary environments degree. Building on case studies that described complex environmental issues, we understood PNS actions to require a critical gaze at our disciplines and then a process for change. We used the idea of disrupting—or interrupting—the established ways of reading the literature and ‘accepted stories’ of what occurred. The interruption allowed the creation of a space in the academic discourse to question the interpretation- and discipline-based assumptions underpinning subject discussions. This opening of a place for questions about the various case study situations allowed students to act as extended peer communities and to acknowledge other stakeholders in to the discussion. The commonest interruptions were to recast the issue as part of a wider and more complex system, to acknowledge uncertainty and to consider the drivers and risks in scaling up and down within systems and sub-systems. We actively promoted interdisciplinarity and extending science as cornerstones to dissolving paradigms and to facilitating negotiation of innovative ways of ‘seeing and knowing’.

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1. Introduction

Interdisciplinary research and training are discussed in the literature as the way forward in managing environmental and natural resource issues [1]. In 2006 the University of Melbourne abolished the approximately 180 existing faculty-centric undergraduate degrees and initiated 6 interdisciplinary undergraduate degrees to be shared across 11 faculties. This paper focuses on Reshaping Environments, a core subject in the new Bachelor of Environments degree. Students previously intent on studying such diverse disciplines as architecture, civil and environmental engineering, construction and property, environmental geography and politics, landscape and resource management, planning and urban design and environmental science are now enrolled in the Bachelor of Environments. From first year entry until 18 months later, these students have no official major. It falls to the two core subjects in first year to lay the foundation for the new degree. This paper considers how the ‘wicked problems’ [2] that environmental issues present have caused us to re-imagine our research and teaching worlds in order to convey and make transparent interdisciplinary thinking in the subject Reshaping Environments.

The academics selecting, writing, and delivering the lectures on wicked environmental problems in this subject include an architect, an environmental engineer, a hydrologist, an environmental psychologist, a landscape sociologist and a behavioural ecologist trained in zoology. While this team is representative of four faculties, all the participants are identified ‘hybridists’ in the sense that we also represent the kind of new discipline areas that transcend traditional discipline

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approaches [1]. The tutors in the subject come from an equally diverse group of university departments and are, to a large degree, multi-disciplinary—that is, many have humanities or science undergraduates combined with contrary science or humanities graduate school experience.

The academics use a critical social theory perspective to build an interdisciplinary process. Commonly one of the team leads with a lecture idea related to the case studies and then each of us has an opportunity to interrupt the flow and add to the ideas on how the topic can represent our interdisciplinary perspectives. Interrogating the individual discipline assists in defining meaning associated with commonly used words, like 'system'. It also moves the conversation from a multi-disciplinary approach—each of us has a method for dealing with a particular aspect of this issue to an interdisciplinary approach—how does our individual way of analysing the issue contribute to seeing it or understanding something different about it—and so, transforming our thinking? In order to accommodate different views on what the 'problem' is or how to shape it for discussion, we are forced to confront underlying assumptions about how our own disciplines order and construct ideas. We acknowledge complexity by recognising that systems are not fixed, not static and not in equilibrium [3]. Interrogating each discipline's praxis leads to opportunities for previously unseen connections between disciplines.¹ Each connection is a signpost for changing how we think and therefore changing how we can convey this idea with our students. This process becomes part of a learning and teaching matrix for us. A 'wicked problem' appears on the whiteboard in its square, but almost immediately the grid is intercut with dotted lines and solid ones, demonstrating the interlacing of ideas from different disciplines. This is a dynamic process of engagement that is later transferred to the lecture hall and the tutorial rooms for the subject. In this paper we provide two case study examples and some commentaries from the student reflective journals to elucidate our process.

Post normal science (PNS) is an underlying principle of Reshaping Environments. We consider our engagement with PNS to be neither normative—a fixed way of approaching the PNS process, nor simply about using it as a practical method [4]. The five basic tenets we adhere to are that: (1) disciplines are not value neutral; (2) different methodologies create different expectations and outcomes, which as Funtowicz and Ravetz described, creates different ways of managing and presenting evidence [5]; (3) disciplines must often look outside their formal boundaries to effect change within their discourse walls; (4) change can come about by thinking about how multiple ways of seeing and doing can work together to create a different and richer picture; and (5) the quality of interaction and the importance of diverse voices and perspectives can flow on to influence the social norms and expectations around environmental decisions.

A student wrote in his reflective journal on created paradigms (Fig. 1):

Consider that we have not yet reached the most complex systems. As time goes on, we find more and more situations where the limited "puzzle solving" psyche of "hard science" is not enough to analyse the problem. PNS will expand to the new, radical areas of increasing complexity, whilst simultaneously feeding the professional consultancy section with newly created paradigms:

I like to think of this view as a wave rolling in on the beach: PNS is the forefront, surging forward along the beach of knowledge. The grains of sand fly roughly around in the white waters of the PNS wave crest, until they clump together and are deposited along the beach as new paradigms. (M S, 13.03.09)

The academics and the students are both part of the extended peer community. This 'community' joins the world of expert and everyday knowledge that is often ascribed to 'just common sense' [1] and the students enter this space through questions and discussion in their tutorial activity, 'questions on notice' in the lectures each three weeks, and their reflective journals. In this way ideas about how to go forward are part of recognising uncertainty and not being disempowered. It is a challenging position to be in as a lecturer in the subject. On the one hand we hold out our specialist discipline areas as the key by which we understand an aspect of an environmental issue. Then we acknowledge that it represents a particular view and that others are also required to construct an understanding of the issue. I am part of the extended peer community when a colleague presents an environmental psychology perspective on the human relationship to nature associated with the transformation of massive forests to pulp and paper, just as she is when the hydrologist in our team describes water flows through the Murray Darling Basin system as contributing to our view of what a river should be.

In this section of the paper we present the process used to instigate engagement and discussion during curriculum development. These are summarized as 'interruption', 'interrogation', 'integration' and 'interaction'. *Interruption* is about creating the space to see or talk about the issue from a different discipline perspective or in a way that disrupts the dominant position or response. Our process is to consider a case study from a journal reading or lecture and 'unpack' the narrative. This provides an opportunity to consider which disciplines provide what kinds of data and then how each uses the data to make an argument. This creates a platform or space to examine the narratives around the data and their findings. This leads naturally to interrogation. *Interrogating* the space that is created is important. It begins with establishing some new or alternative boundaries to the system(s) under examination. It is easiest to do this by adjusting the scale of the issue. It is a key concept in the subject and was discussed in relation to the case studies in lectures, while the students undertook local scale

¹ In this we consider that PNS builds on long standing traditions of praxis related research—research focused on the everyday world of local participants who are engaged as citizens and as an extended peer community. Mattsson and Kemmis describe this thoroughly in their paper: M. Mattsson, S. Kemmis, Praxis related research: serving two masters? *Pedagogy, Culture and Society* 15 (2) (2007) 185–214.

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