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Learning to start systemically in environmental decision making

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Learning to start systemically in environmental decision making

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Abstract

Students of two versions of the Open University course 'Environmental decision making: a systems approach' use a framework that encourages them to start off systemically in environmental decision making (EDM). They do this by exploring decision-making situations before formulating problems, opportunities and systems of interest in situations of complexity. Learning from the design of learning systems for students can inform research practice. A systemic approach for managing water through social learning is briefly described. Drawing from these examples the authors explore the rationale, advantages and disadvantages of starting off systemically in EDM and relate this to social learning.

Context

This paper is about processes of starting out systemically in environmental decision-making, i.e. being both systemic and systematic - the two adjectives that arise from the word 'system'. We use three examples: two from our scholarship associated with pedagogy at the OU (Blackmore and Morris 2001; Open University 2006)[1] and research funded by the Environment Agency (EA) of England and Wales as a systemic inquiry into employing social learning (SL) for river basin planning, part of the EA's responsibility in implementing the European Water Framework Directive (WFD; Collins, Ison and Blackmore 2005). We explore how starting off systemically in EDM was conceptualised and the extent to which a learning approach has enabled new insights and practices to emerge. We conclude by examining how re-thinking situations as if they were learning systems can enhance systemic environmental decision-making and facilitate SL.

Case 1 – 1996-2006: Environmental Decision Making. A systems approach (T860).

Conceptualisation of this course was driven by several concerns: (i) the experience that many mainstream approaches to environmental management were taught and practiced instrumentally (built on a commitment to technical rationality) and (ii) that environmental management connoted a particular form of professional. In contrast we considered everyone was, or soon would be, involved in EDM – hence a generic competence. Our approach was to move beyond the common conception of environment to take a systemic perspective encompassing, but at the same time transcending, the notion that the environment was just the biophysical world. In systemic practice systems of interest are formulated by someone as heuristic, or epistemological, devices, for learning about situations of complexity and uncertainty and in which there are multiple perspectives on what is at stake. When someone (an individual or group) formulates a system of interest

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[1] An OU course costs from $250,000 to over £1 million to develop and is an example of applied R&D as described by Ison and Russell (2000); it can be argued that OU academics are designers and developers of learning systems (Ison 2000).

they distinguish a system from an environment and make boundary judgements i.e. they distinguish a series of relationships – system-subsystem-environment-boundary.

Our experiences were that much EDM was non-systemic with emergent, unintended consequences (e.g. transport policy in the UK and road building in particular). The course started with a case study of the UK Twyford Down motorway development decision-making process, thereby providing students with a common experience of what Ackoff (1974) describes as a 'mess'. We were also mindful of claims such as the President's Council on Sustainable Development (USA; 1996) that: '*The principles underlying education for sustainability include, but are not limited to, strong core academics, understanding the relationships between disciplines, systems thinking…..'*. Students were introduced to a range of systems diagramming techniques to engage with the case study. These involve making boundary judgements (systems maps) exploring causality and influence (multiple cause, influence and sign diagrams) and revealing multiple perspectives (rich pictures; metaphors) for exploring the context of environmental issues and formulating problems and opportunities (Figure 1).
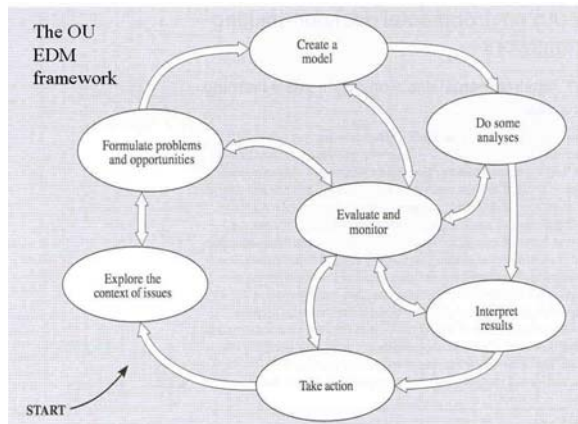

Figure 1. The first OU environmental decision-making framework developed and presented in 1997.

In conception we were mindful that initial starting conditions determine the phase trajectory of any process, including a decision-making process. Our desire was to create capacity to start off systemically in EDM. Our pedagogic approach was to develop a theory-informed EDM framework (Figure 1) which (i) structured the course and the student's own project; (ii) provided a tool or heuristic device for students to analyse and evaluate environmental decision-making situations and (iii) made explicit links with EDM as a form of systemic action research (AR) and experiential learning (i.e. Figure 1 is not dissimilar from a cycle of explore, plan decide, act common to some AR models).

Using the Twyford Down case study students' starting point was to explore the context of issues, recognising that how something became 'at issue' was socially constructed and highly sensitive to who participated in the process. We argued that this stage preceded the formulation of problems and opportunities (Figure 1). In this model the process of formulating systems of interest was introduced as a way of formulating problems and opportunities. Starting out systemically, we argued, came from an appreciation that when confronted by a common situation, individuals are likely to recognize different 'systems of interest' because they have different perspectives. We know that we each have a unique experiential history – even within families, groups or cultures no human being shares the same experiential history. From this unique cognitive history it follows that all we have at our disposal is the ability to communicate about our experiences: we never have exactly the same experience. Thus we each

bring to any situation, and into any conversation, sets of unique perspectives. We introduced 'perspective' in a particular way. The Greek origins of the word mean 'to see or regard'. But what does it mean to see or regard? An explanation would be 'a way of experiencing which is shaped by our personal and social histories' where experiencing is a cognitive act, an explanation coming from the biology of cognition. 'Cognition' derives from the Latin *cognoscere*, or literally 'together to know'; i.e. cognition arises in interactions between a living system and its environment, it is not something that just happens in the brain (Capra and Flatau, 1996). In the Santiago theory of cognition structural changes triggered in a living system (e.g. a person) during their recurrent interactions with their environment are associated with cognitive acts (involving language, emotions and perception), and thus development is always associated with learning; development and learning are recognized as two sides of the same coin. The act of formulating systems of interest, especially as aided by systems diagramming, brings forth new distinctions (perceptions) mediates conversations and enables emotional issues to be publicly expressed.

To remain professionally and socially relevant a replacement course had to reflect these changes (Open University 2006). Our own understandings (or appreciative settings – Blackmore 2004) had also changed through our own practices in scholarship and research (e.g. SLIM 2004a) and through feedback on student experience in T860 and other courses. A pedagogic challenge of all contemporary systems teaching is to create the circumstances for epistemological affirmation or shift in the learner (Salner, 1986). This involves the move from seeing systems as 'real' (i.e. having some ontological status) to seeing 'systems' as epistemological devices for learning about situations of complexity (i.e. 'messes') with a view to changing or improving (transforming) them.
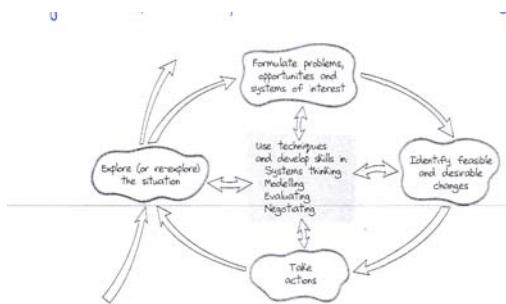

Figure 2. The revised OU environmental decision-making framework for the course T863.

Through experience we had recognised that it was a trap to assume that new students were, or were not, systems thinkers and epistemologically aware, or not. Our experience is that for many people systems thinking (ST) is intrinsic though the conceptual language may be missing. We thus start our new course (T863) by attempting to foster a student's systemic awareness grounded in their own experience. Systemic awareness comes from understanding: (i) 'cycles', e.g. between life and death, various nutrient cycles and the water cycle; (ii) counterintuitive effects, and (iii) unintended consequences. Unintended consequences are not knowable in advance but thinking about things systemically can often minimise them.

A focus of the new course is a core set of understandings and skills associated with ST, modelling, evaluating and negotiating (Figure 2). Our aspiration is to build capability for systemic EDM as a form of praxis and enable a move from participation to SL as a more

meaningful policy and governance strategy (see SLIM 2004ab). Like any framework, the T863 EDM framework has potential strengths and limitations, depending on how it is used. Strengths are that it recognises the following needs: (i) for problems, opportunities and systems of interest to emerge from exploring or re-exploring a situation; (ii) to use techniques and develop skills and understanding for EDM; (iii) for EDM to be considered as an iterative rather than a linear process. The framework can also be used to help question and consider decision-making processes. For example, the teaching supporting the framework explores questions such as: Has the situation been considered sufficiently? Have problems, opportunities and systems of interest been allowed to emerge? Will systems thinking, modelling, evaluating and negotiating help? Who has been involved in the processes of exploring a situation, formulating problems, opportunities and systems of interest, identifying changes and taking action and how have they been involved? What have we learnt from the overall process and how can that learning inform future decisions and actions? The framework's limitations (which it shares with other frameworks) are that it will not be possible to 'fit' every decision-making process to it and all steps in it will not be appropriate for all situations. Students are expected to engage with and use the framework critically and to avoid using it systematically (i.e. in a linear, step-by-step way in which assumptions about the problem/opportunity are reached too quickly or from a limited range of perspectives).

Case 3. A systemic inquiry into social learning for river basin planning

This project drew on understandings from our course developments as well as other research (SLIM 2004a). It comprised a high level systemic inquiry (SI) with a number of constituent inquiries used to progress: (i) learning about the benefits and risks of SL, especially in supporting more effective River Basin Planning (RBP); (ii) developing a conceptual framing for, and stakeholding in, a 'Programme of Measures' project, as required to implement the WFD, and from which systematic project management could proceed, having been systemically situated; (iii) exploring how a new approach to RBP could be incorporated into the traditional 'business' of the EA (a public sector statutory organization with *c.* 10,000 employees); (iv) learning how SL could be extended to the engagement between EA staff and non-EA stakeholders in RB management. The focus in SI is situation improvement through changes in understanding and practices; this involved nested activities depicted by the verbs (actions): (i) 'make sense of situation' (e.g. through use of group-based systems diagramming); (ii) 'tease out accommodations' (e.g. by using an understanding of the politics of the situation to design workshops) and (iii) 'define possible actions' (e.g. by orchestrating debate about the congruence, or lack of it, between systemic models and what was happening or not). The overall inquiry (system) was monitored, measures of performance articulated against acceptable criteria (the three e's of efficacy, efficiency and effectiveness) and control action taken (see Collins *et al* 2006 for more details).

Conclusions

The cases have in common the use of a range of diagramming (or modelling) approaches for engaging with situations of complexity and uncertainty by starting out systemically. Our experience is that starting out in this manner transforms situations in which student or research participants find themselves by facilitating or mediating

changes in practices and understandings (SLIM 2004a). Systemic diagramming can surface different mental models about situations and reveal patterns of influence and causality, boundary judgments and positive and negative feedback dynamics. This happened in our workshops with EA participants; evaluative interviews revealed that the approach enabled many to acknowledge the complexity of their situation (for the first time) and to recognise that they had to learn there way to appropriate actions. When situated in contexts which acknowledge participants prior experience and the historicity of the practitioner (decision maker/stakeholder), as well as tools/techniques and situations, we have found it possible to create the circumstances for the emergence of SL understood as concerted action in situations of complexity. Our praxis is concerned with the design of learning systems in which we seek to foster the conditions for emergence. In doing so we differentiate between systemic and systematic EDM arguing that there are benefits in regarding these contrasting, but complementary, approaches as a duality, a whole, rather than a self-negating (either/or) dualism.

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