



Using Complexity Theory to Make Sense of the Curriculum

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Members of the curriculum network are invited to comment on and develop the ideas in this paper.

Complexity theory provides a way of examining and making sense of complex natural and social systems. Complexity refers to the condition of the universe which is integrated and yet too rich and varied for us to understand in a simple mechanistic ways... complexity deals with emergence, innovation, learning and adaptation (Stacey et al 2000, Tosey 2002a). Learning in the context of an HE award is rich and complex. Tosey (2002b) has recently applied systems thinking developed from complexity theory to teaching and learning situations in HE. These notes build on Paul Tosey's work and use the conceptual framework developed by Ralph Stacey and colleagues to show how certain types of curricula might engage with learning in the unstable and unpredictable zone of complexity which lies somewhere between the world of rational planning and management and chaos.

Stacey et al's concept map (Figure 1) contains within it three domains : 1) a zone in which behaviours and thinking are dominated by rational thinking and traditional management practices 2) a chaotic zone in which practice disintegrates into anarchy and 3) a zone of complexity on the edge of chaos. In this zone traditional management approaches are not very effective but this is a zone of high creativity, innovation and transformative learning as people and communities continually adapt and evolve (see Tosey 2002a for a concise explanation). This conceptual view of the contexts for learning in organisations and the wider world can be used to understand different approaches to curriculum design.

Programmes and courses can be devised within the mindsets and behaviours of the zone of stability or the zone of complexity but they are fundamentally different in their conception. As an oversimplification, in the zone of stability people are told what they need to know and be able to do in the context of a particular HE award. This contrasts with the approach used in the zone of complexity where people are encouraged to identify for themselves what they need to know and what they need to be able to do to achieve an objective and they create or adapt the processes to do so. Curricula can of course be created in a way that enables both approaches to learning to be utilised.

Curriculum making in UK HE is dominated by rational thinking and behaviours that are regulated through technical rational, political and judgemental decision making processes (Figure 1). In this world curriculum governance emphasises planning and managed processes to achieve planned intentions. Curriculum making involves either: 1) the control of student knowledge development through a prescribed content-rich curriculum or 2) the control of learning intentions (intended learning outcomes) and the process to achieve these intentions. Negotiation as to what is valued in learning is primarily within academic (and related professional) peer communities. There has in recent years been a progressive shift from 1 to 2 as learning outcomes have become the dominant vehicle for the systematisation of formal learning across the whole education system. Although subject knowledge is still prioritised over other forms of learning in most subjects

the increasing emphasis on learning (driven for example through subject benchmark statements and policies like personal development planning) is encouraging academic communities to consider skills-based learning that is not essentially subject-based. Many of these skills are essential for survival and performance in the world of complexity.

Institutional policies like key skills, programme specifications and subject benchmark statements, and personal development planning are all promoting a wider conception of learning that values the types of skills and behaviours necessary for working on the edge of chaos. The technical rational curriculum response to these expanded notions of learning is to systematise the alignment of curriculum and teaching, learning assessment methods, support and guidance, and resources to achieve the desired learning outcomes. Increasingly the theory of constructive alignment (Biggs 1999) underlies curriculum making in the managed environment.

A different approach is required to curriculum making for the type of learning that is most useful in the zone of complexity. It is in this area that innovation, experimentation and creativity in curriculum design are most likely to occur. Curricula that are designed to promote behaviours that are consistent with this world pay particular attention to the processes of learning. While programme governance is still a managed process the structures are more permissive and less predictive and controlling. Curricula and learning outcomes are not fixed in advance of learning. They emerge through processes that are partly planned and partly unplanned in a way that expects to exploit opportunities as they emerge. Negotiation about the focus for learning and what is valued in its assessment

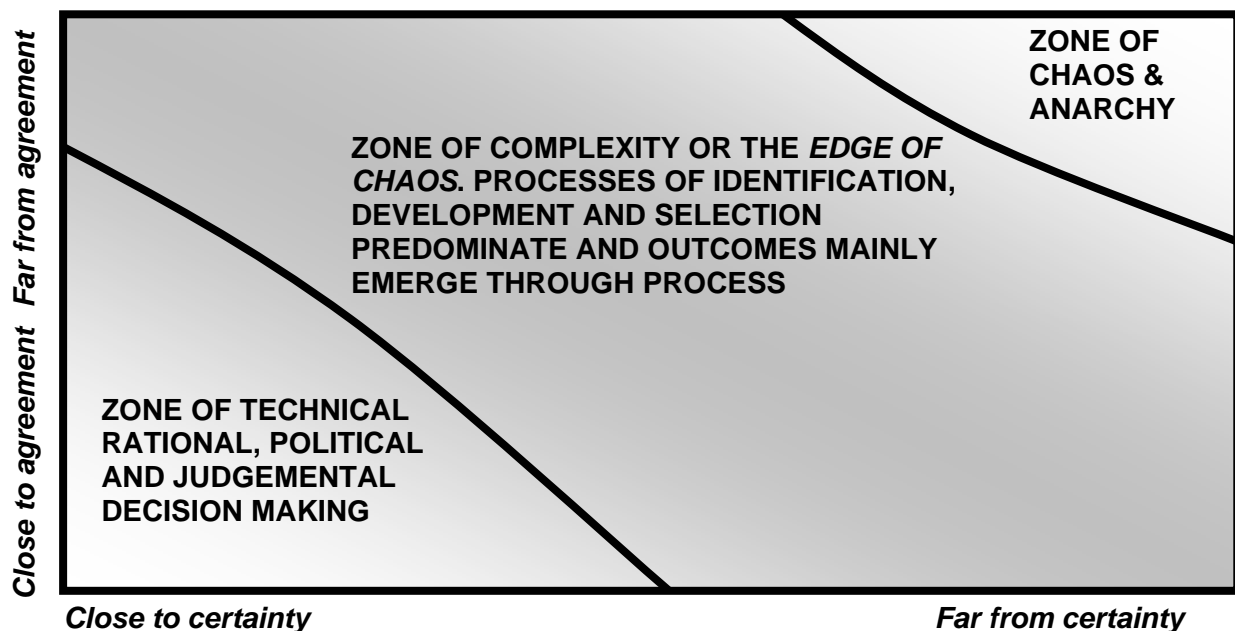


Figure 1 Conceptual framework developed by Stacey et al (2000) Complexity and management: fad or radical change to systems thinking? London Routledge.

involves the whole learning community ie teachers/ facilitators and learners. Learning strategies emphasize both independent and collaborative learning. Learners define the problems and work themes and create the processes to address them. Learning is

concerned with creating good processes to achieve good outcomes. There is strong emphasis on knowledge development by individuals and governance is primarily through contracts, agreements and action plans. Examples of curricula that engage with this zone include: problem-based curricula; enquiry-led curricula; negotiated curricula /contract learning and personal development planning. Programme governance for negotiated work-based learning (self-managed learning) illustrates this type of learning environment in which an individual effectively creates their own curriculum and assessment process to suit their unique learning circumstances. It is of course possible to design a curriculum that combines features of a process-led curriculum with the rationally planned curriculum.

Where chaos is writ large curriculum governance is ineffective or deficient to support learning in the way that was intended. The reasons for this will be complex and almost certainly bound up with instability caused by rapid change and or unforeseen circumstances such as the loss of key teaching staff or the rapid expansion of student numbers without a complementary increase in resources. Such circumstances may require radical reappraisal and change but this may be difficult to achieve for all sorts of reasons. If this situation prevails then there will be a feeling that things are out of control. Such unstable situations are very uncomfortable for teaching staff, students, administrators and managers but are themselves a source of energy and a stimulus for radical curriculum reform if the right conditions can be created. If chaos is defined by lack of agreement and lack of certainty, then operating in a chaotic learning environment and 'surviving' (learning anything at all), must fundamentally be about effectively applying the skills of coping with uncertainty and with a lack of any explicit consensus.

Acknowledgements

Thanks to Malcolm Shaw and Paul Tosey for helpful comments.

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