

“Walking the Line Between Structure and Freedom”

**A Case Study of Teachers’ Responses to Curriculum Change using Complexity
Theory**

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Abstract

This thesis uses complexity theory to explore education in the context of a changing curriculum called 'Opening Minds'. This new curriculum was introduced in the case study school in response to a wider curriculum change which emphasised 'learning to learn' and the development of 'skills for the 21st Century'. In this study, a 'complexity thinking' theoretical framework was adopted, drawing especially on the work of Osberg and Biesta (Osberg et al., 2008, Osberg and Biesta, 2007, Biesta and Osberg, 2007) and Davis and Sumara (2006; 2007), paying particular attention to concepts of emergence and complexity reduction. Complexity theory, through the 'logic of emergence' offers a challenge to mechanistic approaches to understanding the world which, despite the work of postmodern and poststructural scholars in education, remains dominant in educational practice. The Opening Minds curriculum that is the focus of this case study demonstrated the potential to challenge this mechanistic approach, as the teachers expressed a desire to work in different, flexible and creative ways: this thesis therefore explores complexity theory's challenge to a mechanistic approach in this particular case. It also addresses the relationship between Opening Minds and science education using complexity thinking. To facilitate exploration and analysis of the case, concepts of temporal and relational emergence and complexity reduction to develop a 'complexity thinking' understanding of concepts of agency/structure, power, identity and reflexivity. This entailed reconceptualisation of these ideas in a temporal-relational sense that explicitly incorporates a sensitivity to emergence. Specifically, an additional dimension to Emirbayer and Mische's (1998) construction of multidimensional agency was added: that of creative agency.

The research was conducted as a case study in which a 'bricolage' approach to data collection and analysis was used as part of an explicitly 'complex' methodology, addressing questions of the challenge of complexity reduction and ethics in research drawing on complexity theory. The findings indicated a challenge for teachers in negotiating tensions as they attempted to adopt approaches that could be considered 'emergent' *alongside* other 'mechanistic' practices. These tensions were explored in detail in relation to the concept of 'reflection', and in the interaction between science and Opening Minds. Bringing together the empirical and theoretical work in this study, it is suggested that mechanistic and emergent aspects may helpfully be viewed as a 'vital simultaneity' within the educational

relationship (Davis, 2008) with the interaction between them facilitated by creative agency within a 'pedagogy of interruption' (Biesta, 2006). It was further argued that reflection could be used in responsive and flexible ways to support both learning and assessment as a crucial aspect of a pedagogy of interruption. Such a 'contingently responsive and creative pedagogy' may support the interaction between science and Opening Minds productively. It is suggested that complex approach to a pedagogy of interruption could support teachers in engaging with the creative and diverse elements of science or learning to learn curricula whilst maintaining the mechanistic aspects of teaching that support students in learning key concepts and skills.

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