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Learning to Teach in 'Urban Complex Schools'.

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Background

With the growth of initiatives such as Teach First, student teachers are more commonly being asked to train in what Teach First (2009) and Teach for America (Donaldson, 2008) refer to as ‘urban complex schools'. This involves classrooms in which there is a diverse range of educational needs and in which either more than 30% of pupils are eligible for Free School Meals or under 25% of students achieve grades A*-C (including English and Maths). Furthermore such student teachers often begin with an 80% teaching timetable for which they are solely responsible.

In training these teachers school-based mentors and university tutors are using a range of pragmatic and theoretical frameworks to guide student teachers in learning about and operating in complex environments. This paper attempts to define such environments by drawing on the growing field of complexity theory and assess the potential of using recent developments in the field to build a theoretical framework which allows student teachers to better operate in challenging classrooms.

Research Questions

This paper focuses on the usefulness of complexity theory in understanding the learning that takes place in classrooms and seeks to answer the following research questions:

1. How can classrooms within ‘urban complex schools' be characterised with reference to complexity theory?

2. What might be the advantages and disadvantages of introducing PGCE students to a view of classrooms in line with complexity theory?

3. What do student teachers think of complexity as a framework in relation to understanding classrooms?

Methods

Drawing on experience of working with Teach First science participants; a small scale study with a PGCE science cohort and PhD research into the feasibility of applying complexity theory to understanding classrooms the study brings together theoretical research and the professional reflection of both university tutors and participants of initial teacher training.

Building on the work of Richardson and Cilliers (2001) in distinguishing the main modes of utilising complexity theory within the social sciences, a comprehensive mapping of literature both within the physical and social sciences is used to evaluate the validity of applying concepts from complexity theory to classroom learning.

From this mapping a description of a classroom as a complex system is developed and related to Cilliers (1998) characteristics of complex systems. The usefulness of this framework for student

teachers is discussed and related to current practice within the Teach First and INSPIRE PGCE initial teacher training programmes. The difference between the two initial teacher training routes forms a particular focus.

A study conducted with a small cohort of PGCE students utilised an ‘exploratory research interview' (Fowler & Mangione, 1990) to ascertain their opinions of the use of complexity in understanding classrooms. These students were all post-doctoral researchers in physics or chemistry who trained to teach through the INSPIRE PGCE, and the limitations of this study are recognised in drawing conclusions. This study is related to the earlier discussion of usefulness for trainee teachers and the implications of the study for all professionals involved in teacher training is expounded, with particular reference to those in ‘urban complex schools'.

Frame

Richardson and Cilliers (2001) outline three different modes of operation in applying complexity theory to the social sciences: ‘hard complexity science', ‘soft complexity science' and ‘complexity thinking'. Critical consideration of these different forms of complexity theory when applied specifically to the classroom is combined with data from interviewing student teachers to inform the development of the theoretical framework.

Complexity theory describes systems in which groups of agents acting in relation to only their immediate environment nevertheless develop an organisational structure which is able to evolve and adapt. It also highlights the sensitivity of this structure to small changes and the indeterminate nature of these changes. By considering school pupils as such agents the dynamic nature of learning can be related to models of complex systems in the physical sciences. The characteristics of a complex system, as derived from a mapping of literature, can then be discussed in relation to what they might mean in a classroom. Examples include the sensitivity of learning to ‘fluctuations' within the classroom system; the importance of the history of the system in terms of relationships between pupils and teachers and the potential for a classroom system to become ‘locked in' to a particular mode of operation. This framework yields valuable insights into classroom dynamics and lays the foundation for further work in the field.

Research findings

The application of complexity theory to classrooms draws into question a number of the implicit assumptions made within contemporary considerations of the classroom. Through contrasting complexity to ‘linear' formulations of classroom activity this research draws into question the reliance on simplistic measures of performance based upon standardised testing, the dependence on inflexible learning objectives and the ability of mentors and tutors to suggest definitive strategies for improvement.

For the student teacher complexity theory offers an explanation of the limitations of learning theory and formulaic classroom policies and instead promotes the experience of teachers in dynamically responding to the needs of their classes. Student teachers within the study were on the whole in favour of introducing complexity theory as a framework in which classrooms could be understood. However, care should be taken that complexity theory does not reduce to a post-modern framework in which any strategy is equally justified. The limitations of complexity theory in providing definitive strategies are also emphasised within this paper.

The findings of this research suggest complexity theory may be of particular use to intensive teacher training routes in which the range of challenges within the classroom is very large and the amount of time for reflection is reduced in comparison to traditional PGCE programmes. Recommendations for tutors and mentors of student teachers in ‘urban complex schools' are expounded.