

How do classroom dynamics affect learning?

Mark Hardman

We start each lesson with a learning objective and then, through carefully matching activities to that objective, the pupils learn what we intended them to. "It's simple isn't it?" Perhaps it is a bit too simple? In this paper I am going to argue that learning is 'non-linear' and that our classrooms are complex places. I am also going to argue that this should not be a source of worry, because we already know how to deal with the complexities of learning.

The view of learning as a very 'linear' process, with the input of an activity leading to the output of learning, can be attributed to The National Strategies which ran in England between 1997 and 2011. The focus on clear objectives and assessment against these had a positive impact on the attainment of pupils (DfE, 2011). However, there is a feeling that sometimes teachers are 'playing a game', whereby they are able to show that pupils meet the objectives but are not fully convinced that learning has taken place. Experienced teachers see this when the pupils have completely forgotten what they 'learned' yesterday, but I also see it when new teachers first look at assessment in classrooms. Like the child in *The Emperor's New Clothes*, a minority of new teachers see that it is not really learning that is being measured but a pupil's ability to say the right thing. The difficulty of actually measuring learning is that we don't really understand what it is.

What is learning? How do you know when you see it?

Attainment is the performance of a child on a test or in a task but learning is much messier. Although educational neuroscience is way too young for us to draw any firm conclusions, there is growing evidence that the brain might be seen as a 'non-

linear' or 'complex' system. Computer models (Cilliers, 1998), experimental work (Freeman, 1999) and cognitive neuroscience (Kelso, 1995) all suggest that when we learn, there is a change in the pattern of electrical signals across the brain. This does not happen in a simple way however, the new brain pattern suddenly emerges and there is an abrupt change in brain function. This will not be surprising to teachers, who talk about 'light bulb moments' when pupils suddenly 'get it'.

Furthermore, there is whole body of evidence that pupils' ideas are often resistant to teaching (Brown and Hammer, 2008); that is, they continue to hold naïve views despite a huge effort on the part of the teacher. Then, a seemingly inconsequential influence makes them suddenly shift their thinking. This is what I mean by 'non-linear'; there is not a simple relationship between what is taught and the influence it has. Viewing learning in this way seems to fit the tacit experience of teachers better than seeing learning as a simple input-outcome process. Learning is highly sensitive to the history of the learner and the context at any moment in time. But if learning is sensitive to the context in which pupils learn, then that means our classrooms have an influence on how pupils learn.

Do different classes 'feel' different; is there a 'class dynamic'?

Learning comes about by pupils interacting with the people and the resources around them and this having an unpredictable influence on their brains. We all know that the way pupils interact affects learning. We know that grouping pupils of different attainment levels gives different outcomes from grouping pupils with similar skill sets (Watson, 1992; Thurston et al., 2010). We know that it is not just their understanding but the collaborative skills that children have that influence their success in group tasks (Baines, et al., 2007). We know that the way they talk to each other is important (Mercer, et al. 2004); that pupils can learn from watching each other (Bandura et al.,

1966) and that different pupils bring different experiences and parental expectations. Bourdieu (1986) calls this 'cultural capital'. We also suspect that the weather influences children and if the lesson is before or after break. As Sampson and Clark (2009) concluded, the outcomes of pupil interaction depend upon the task and the context. To me, the joy of teaching is the unpredictable reactions, the strange conversations and the need to be responsive to what emerges. Yet educational theory does not seem to talk about this.

It is worth considering that what happens in the classroom is 'non-linear' and complex. The course of a lesson can change quickly and the 'character' or 'dynamic' of the class is sensitive to internal and external influences. Wegner, Raymond & Erber (1991) found that adult couples were able to remember a list of objects much better than people who had just met. They proposed that when people work or live together they take on a kind of 'social memory'. I was recently told by a teacher that her class were 'like a wolf pack' and they could work together to solve problems or devour an unsuspecting supply teacher.

How do teachers respond to classroom dynamics?

There is a growing, but still marginal, field of research looking at how we might describe classrooms as complex systems, drawing on a broad range of research in the sciences and social sciences. However, whilst the research catches up, I wish to put forward the case that teachers already know that learning is messy, sensitive and 'non-linear'. They might not be able to put it into words but experienced teachers have a 'feel' for their class and are constantly responding to the dynamics of that class. We might speculate that this is because teachers' brains also adapt to the class as they spend time with them. What I like about this way of looking at classrooms is that it values classroom experience in a way that very little educational theory does. It also tells us

that classrooms are messy, complex and unpredictable, but the best thing that you can do as a teacher is to get involved.

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