The Review

Education at the edge of chaos

When things become complex and uncertain it is harder to predict the outcome of interventions. This simple truth is embedded in complex adaptive systems theory, based on chaos theory. Innes, Campion and Griffiths¹ describe how this applies to consultations, where medical or social complexity can push a consultation to the edge of chaos. These challenging consultations have unpredictable outcomes and this carries risks such as upsetting the doctor-patient relationship or bringing up issues that either the doctor or patient did not wish to discuss. Sweeney² discussed these principles further and describes their importance in understanding what we call evidence-based practice and research. In this article I will discuss the application of complex adaptive change theory to medical education using a teaching trip to Libya as an example.

Complex consultations are difficult and exhausting for the doctor. One can try to simplify the patient's long interdependent agenda and focus on 'the most important thing' for the patient to drag the consultation back to a simpler linear logic style where a traditional biomedical model is appropriate, but often the patient will thwart such an approach with comments like 'but it's everything doctor'. Alternatively one can adopt a more intuitive style and hold all the issues at once, like juggling plates, while a plan emerges that meets the complexity. This non-linear intuitive approach to consulting is less objective, less to do with 'evidence base', and carries a risk of getting it wrong as the outcomes are unpredictable. However often a transformational step change will occur in such consultations. GPs in the Balint tradition will recognise this as being similar to 'the flash'.³

If one takes such complexity to a higher level, such as in a whole organisation or system, one sees a complex network with multiple unpredictable elements and transformational changes occurring, resulting in an emerging change or development that is adapted to its context, but unpredictable in nature. Anderson coined the phrase 'evolution at the edge of chaos'⁴ to reflect this process. Evolution is *par excellence* an example of emergent change in a complex adaptive system. Harkema⁵ applies this concept to group learning in a business context and helps us

understand how the complex adaptive system of a company can result in emergent innovative change through the processes of non-linear dynamic behaviour and self, rather than imposed, organisation and structural development.

In October 2010 an associate director from London Deanery and I, a VTS programme director, travelled on behalf of the RCGP as experienced medical educationalists to Libya, to help to train a cohort of new GPs. Libya had no tradition of general practice but in response to overworked secondary care and escalating healthcare costs, the government of Libya had instituted a period of rapid change and were training a group of 300 experienced secondary care clinicians to become GPs.

Although some educational assessment work had been done, there remained a very high level of uncertainty about this visit for us. We had little or no idea about the following:

- The numbers on the course, possibly up to 140, with just we two as facilitators.
- The educational needs of course members. We had no idea if or how much primary care learning had gone on before us.
- The expectations of course members, even to the times they expected the course to run each day.
- The linguistic skills of those on the course. Would we teach in English or need interpreters?
- The content of the course! We expected them to have a good knowledge base but what of consultation skills and 'softer' aspects of a GP curriculum? We had no real idea of what model of general practice they were training for.
 - The culture of those on the course.
 - Whether the participants were seeking didactic or interactive education.
 - Whether the participants were prepared to express views openly and honestly or feel daunted and restricted

by political constraints.

- Facilities — we had been warned that we would have access to four large rooms, none big enough for the whole group, but one room was linked to the traditionally set out lecture theatre by video link! Basic resources like flip charts pens and IT would depend on our skills in negotiating in our nonexistent Arabic.

The situation was highly uncertain and unpredictable and we were tasked with facilitating learning and change. The whole group and its learning context was a complex adaptive system. We could have taken the route of simplifying the complexity and reducing the variables by, for example, going for a set lecture programme, which would have been safe but would not address the complex needs we were likely to encounter. Instead we went for the juggling plates approach.

We made an instant intuitive decision on arrival, seeing the room layouts, to abandon what we had prepared and divide the learners into two large groups and teach them independently. We embraced the uncertainty and planned each session in the break beforehand, drawing on our own resources as experienced GP educationalists. We set our course on an intuitive non-linear and therefore unpredictable pathway.

The first day was spent largely learning about the group and trying out different approaches with them, but in each group a way forward emerged in the chaos. The numbers settled to between 30 and 70 for each group, in rooms of varying inappropriateness of layout. The learners did indeed have an extensive knowledge base between them, having had 6 weeks of intensive lectures from secondary care doctors, but the knowledge was not focused into useable primary care protocols, and higher order learning, in particular consultation skills were undeveloped. They were used to a lecture format and their experience of interactive teaching was

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limited. Language skills in English were good but formal and use of colloquial English in facilitating or in role play was problematic. However, there was a strong enthusiasm to learn and a willingness to try new approaches.

In one group the suggestion of learning sets based on localities was rejected as not appropriate to their context and in the other group an introductory presentation of UK general practice was also rejected as dull. We allowed the group as far as possible to set their ways of working.

In both groups the emergent way forward was interactive teaching based on small groups, teaching skills as far as possible, looking at organisational skills, consultation skills, and focusing their experience and knowledge base. Using the group's energy we could overcome major problems such as how to do role play consultations in front of a lecture theatre of 50 people where the audience had no experience of the ground rules of this type of work. I had no problems getting volunteer role players despite the group tendency to degenerate into 30 people shouting at once at the role player what they 'should' do.

The emergent teaching solution that evolved from the chaos was largely new to the learners and broke many of the facilitators educational 'rules', but resulted in an effective learning event for the participants. By the end of the 4 days the group had largely abandoned their ingrained tradition of learning from books, and had embraced interactive skills learning, quickly picking up key new concepts like safety netting and housekeeping and being able to demonstrate use of them in role play.

As medical educators with a wide experience and repertoire of facilitative strategies, we were able to work at the edge of chaos, with levels of uncertainty that were new to us, drawing on the energy of the groups. We worked intuitively, accepting uncertainty, allowing a solution appropriate to the context and the learners to emerge in an evolutionary process based on multiple small transformational step changes that allowed the learners to self-organise their learning experience. Complex adaptive systems theory helps us to understand this process.

We found the course exhausting, but by using intuition, innovation, open space and

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taking huge risks we were able to bring about change in the learners and their view of how to learn. As an educator I am now much more confident in the far less uncertain teaching situations I face as a UK educationalist and am looking forward to having more times of initiative facilitated learning with my VTS group.

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Provenance

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A flu clinic cynic

It's unusually quiet here tonight, presumably as it's late, dark and pouring with rain. Some surgeries serve coffee or even hold a raffle. Not normally needed here, the draws are of a different nature: the prestige of being first in the queue (2 hours early is not unheard of, we've never run out of jabs but you can't be too sure) and the yearly chance to catch up on village gossip. 'That doctor's leaving, he's the one who set up the new super-surgery' (Really? So why's he still here 6 months later?). 'That nurse has put on a bit of weight' (Well she is now 8 months pregnant!).

The first patient, one of the Reluctants, pulls up his sleeve, 'they' told him to have it so he's having it, but it'll be your fault if anything goes wrong! Next is the Worrier, the young fit-looking lady, who when you check is feeling well today lists more problems than could ever fit on her EMIS summary page. She once fed her uncle's girlfriend's pet hamster when it was on its last legs and so has yearly vaccines as a 'carer'. The Old Timers are last, coming in droves, sleeves ready rolled-up. They've survived two World Wars, this is simply something else to endure (perhaps even enjoy!).

The doctors try to conceal that they don't know their patients names (wondering if they ever did, and whose memory is failing). An older gentleman asks the senior partner, 'Never seen you before young doc, are you new?!' At least tonight you can do something for your 'heartsink' patient even if the consequences (sore arm, flu-like symptoms and more) are just around the corner.

The truth is I'm a converted cynic, really it's great fun, I'm off to join in!

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