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## Revolution is easier than evolution!

### Abstract

The medical school of the University of Liverpool adopted a new curriculum in 1996, changing from a traditional, departmental led, didactic curriculum to an integrated, student centred curriculum. The outcome has been positive, but the process painful. In this article I discuss the lessons learnt, and indicate that revolution can be more effective than evolution.

### Keywords

Curriculum reform, medicine, staff development, outcomes, evaluation

## Revolution ist einfacher als Evolution!

### Zusammenfassung

Die medizinische Fakultät der Universität Liverpool hat 1996 einen neuen Studienplan eingeführt. Aus einem traditionellen, lehrerzentrierten, didaktischen Lehrplan wurde ein (fächer-)integriertes, studentenzentriertes Curriculum. Das Ergebnis ist positiv, doch der Weg dahin war beschwerlich. In diesem Artikel werden die dabei gewonnenen Erfahrungen und Einsichten diskutiert und schließlich gezeigt, dass Revolution effektiver als Evolution sein kann.

### Schlüsselwörter

Curriculumreform, Medizin, Personalentwicklung, Ergebnisse, Evaluierung

## 1 Change

In the United Kingdom, medical schools are required to produce graduates who can be registered as medical practitioners by the General Medical Council (GMC). In the face of perceived curriculum overload, and a move towards more community-based medical care, the GMC produced a document (GMC, 1993), subsequently updated (GMC, 2003) which laid down the blueprint for undergraduate medical education, and set a series of standards which challenged the traditional medical curriculum. To this external imperative, was a feeling of the senior management of the Faculty that our graduates were not as well prepared for their postgraduate careers as we would wish. This has subsequently been documented in a retrospective study under the auspices of the Royal College of Physicians (McMANUS et al., 2008), which covered the period immediately before and surrounding the

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implementation of our new curriculum. The third driver for change, subsumed within the first two, is the desire to ensure patient safety.

The challenge which faced the curriculum design team was three-fold.

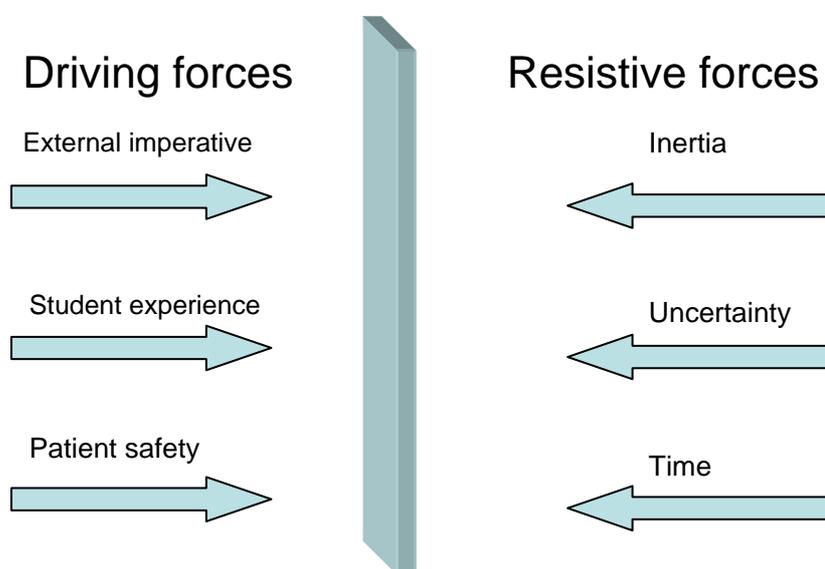


Figure 1 Force field analysis (after HAI, 1986)

University academics value their autonomy, which imposes a degree of inertia on any change measures. The *inertia* stems partly from the institutional management structures (DRUMMOND, 2000; BURNES, 2004), partly from the tensions inherent between different parts of the institution (MORGAN, 1989), and partly from the way in which academics perceive themselves (LUEDDEKE, 1999). In the case under investigation there is the additional professional component, whereby clinical academics feel, with some justification, that they are the guardians of standards within their profession. This couples with uncertainty about the benefits of change, which is often perceived as inertia, occasionally as obstruction. Finally, academics, and particularly clinical academics are under considerable pressure of time. They are required to balance their University administrative and teaching loads with the imperative to research, and a personal and professional commitment to their patients.

Any proposal for change needs to take each of the resistive forces into account, and deal with them appropriately.

It may mean investigating ways of changing the institutional structures; in Liverpool we replaced a curriculum based on departmental lines, with a centrally planned and integrated curriculum (described below). Clearly this was easier to write than effect, but it was the key to success. We also negotiated a path through the University quality assurance system which made the task more manageable.

To face the issues about *uncertainty* we ensured that we had respected members of staff who acted as champions. We held “road shows” in every department and major teaching hospital to explain the rationale for the changes. We produced newsletters, and invited external speakers to Faculty Lectures. At each stage we

emphasised the driving forces for change – external imperatives, the research-based evidence, and the potential advantages in terms of students', and ultimately patient experience. Significant departmental and Faculty members of strategic importance (e.g. a new Dean) were sent to places that had already implemented the type of programme that we wished to emulate. It was essential to demonstrate that the desired outcomes could be achieved, and that they would cause no, or minimal, negative impact on the clinical academics (BLAND et al., 2000a).

We are still addressing the issue of *time*. This has proved to be the most difficult, not least because the demands on both university and clinical academics are increasing inexorably. The solution, when it is finally reached, will be a combination of equitable distribution of teaching and the appropriate professional recognition for those who commit to education as an important strand of their career.

The key points for all change management are research, involvement, information and training (JISC, 2006). This led to a need for a dedicated team of educationalists and administrators, initially seconded and gathered together within a Medical Education Unit, based in the Primary Care Department, but now subsumed within, and replaced by, a School of Medical Education.

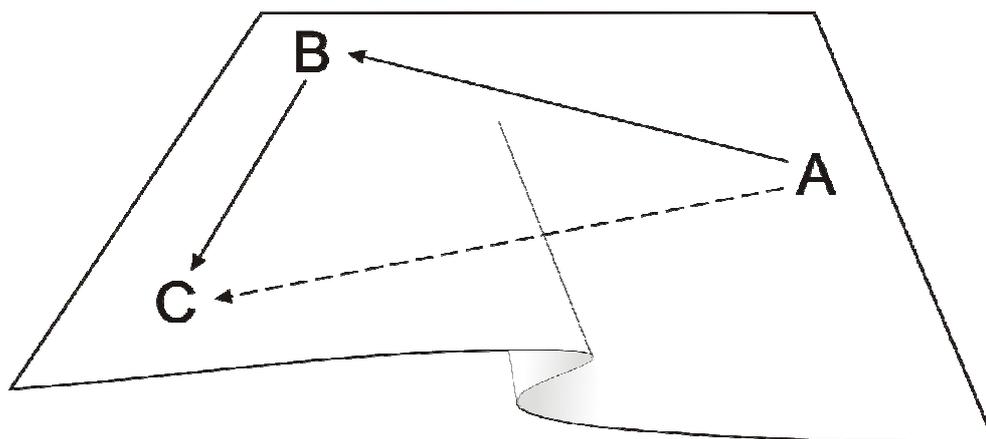


Figure 2 Catastrophe Theory

It may be helpful to look at change through the lens of catastrophe theory. Moving from A to C directly is difficult since it requires energy to „climb“ the fold. Moving from A to C via point B is relatively simple, but takes a long time and may require more than one change in outlook. In some circumstances this is the appropriate and honourable course. We chose to change the landscape by lowering the fold. Practically speaking this meant organising the curriculum centrally and removing power and responsibility from the departments.

This was a delicate task, since it carried the risk of disenfranchising the individual departments. We attempted to counter this by involving as many individuals on the different curriculum design and working teams as possible. It was also possible to demonstrate that there was considerable overlap between departmental responsibilities, particularly during the pre-clinical years. For example; muscle contraction was covered by cell biologists and physiologists, and biochemists, physiologists, cell biologists and pharmacologists all taught about beta-adrenoreceptors.

## 2 Championing

As described above, we adopted a championing system. The championing system has been described by Peters and Waterman (BURNES, 2004), as part of an “excellence” model. It differs from a Japanese style “Total Quality Management” (JURAN, 1989; DRUMMOND, 2000) in that it explicitly steps away from hierarchy. In the Japanese model, change decisions are taken as close to the problem or event to be changed as possible. In the championing system a range of people form an *ad hoc* group to tackle a particular problem. The members of the group are chosen (or coalesce) on the basis of influence and expertise. Communication is informal and intensive, and the group works in a mutually dependent fashion. Because of their influence in the organization, less effort is required to effect change – it is a variant on the tipping point model (see Figure 3, after KIM & MAUBORGNE, 2005).

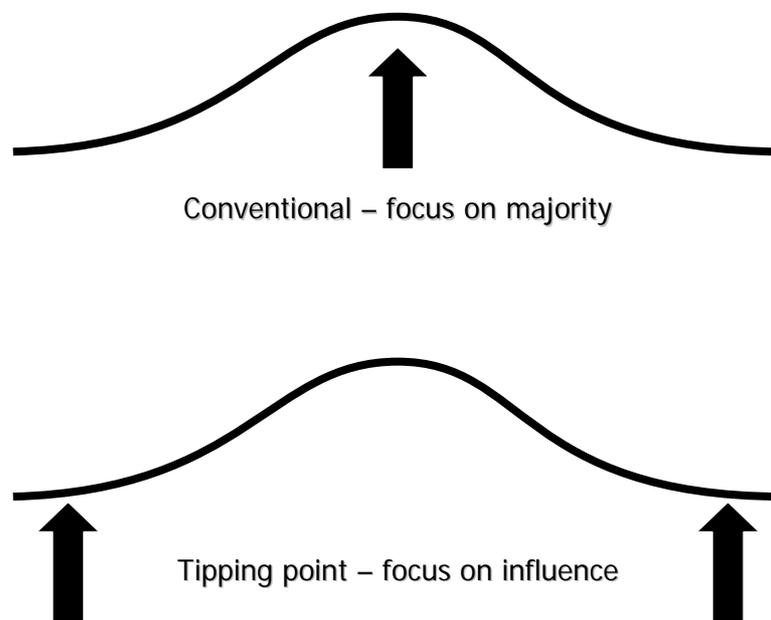


Figure 3 The Tipping Point Model

In Peters and Waterman’s original model the championing system includes three major roles (BURNES, 2004, p.91)

- The product champion
  - Who was drawn from existing staff
- The successful executing champion
  - Who was a new appointment
- The godfather
  - A team of people from Faculty senior management

To these we added teams of people who possessed the technical expertise to take responsibility for designing and implementing different aspects of the curriculum. We also ensured that some of the members of the groups were, at least initially,

less than enthusiastic about the proposed changes. In „management speak“, the championing system achieved a Medici effect (JOHANSSON, 2004). A Medici effect occurs when ideas from two cultures come together. The term derives from the Medici family, a banking family in Florence in the fifteenth century who had the vision (and the money) to bring philosophers, scientists and artists together in an explosion of creativity, which was effectively the blue touch paper of the Renaissance.

In our, rather more prosaic, world it meant bringing together a team of people with medical, administrative and educational experience, and giving them the freedom to design the best possible curriculum. The calibre of the team, especially of the champions, was crucial to the success of the venture, as has subsequently been described by Bland and colleagues (BLAND et al., 1999; BLAND et al., 2000b). In our view, the key factor is that the champions are seen as understanding both what is needed and the current system, and trusted to use their expertise for mutual benefit, in the truest sense, they must be seen as professional (PELLEGRINO, 2002). This seems to us to align with Bland's observations concerning the qualities and behaviours of successful leaders (BLAND et al., 1999).

### **3 What changed?**

The initial planning and design process started in the academic year 1991/1992, with the original intention of adopting a new curriculum in 1995. In the event, we opted to introduce the new curriculum in 1996, and we have never regretted the extra time spent in planning and refining.

The old curriculum had been along the traditional European model; a five year curriculum, aimed at school-leavers, with a distinct preclinical phase, followed by a longer clinical phase. It was largely hospital based, and the different departments had considerable autonomy over what was covered in their disciplines.

The massive expansion of knowledge in the basic and clinical sciences led the General Medical Council to charge all medical schools in the UK with reducing curriculum overload (GMC, 1993; GMC, 2003). They also required students to be given explicit training in communication skills, more experience in the community setting, and training in the skills needed to support life-long, independent, learning. The design team had to devise a curriculum which would support the aims and objectives of the General Medical Council, and yet retain the support and confidence of the medical community.

A series of championing groups (see above) was formed, each of which had a specific task, and comprised as wide a membership as practicable. For the sake of this article, it is useful to consider two task groups in particular. One, chaired by the author, was responsible for determining, on the basis of available educational evidence, the most effective vehicle for delivering the knowledge and attitudes components of the curriculum. The other key group was required to determine the clinical cases that the new graduate should be able to diagnose, treat and manage, and which other cases would be necessary to ensure a reasonable understanding of medical practice, as would be experienced by a new graduate. Other groups

considered the overall plan of the curriculum, the times and ways in which clinical skills would be acquired, and the number and type of clinical placements that would be required. At the time of planning we anticipated 200 students in each entry cohort, although in the intervening years this has grown to nearly 400.

It rapidly became clear that a simple evolutionary approach would not provide the educational change we needed. Although most people agreed with the need for reducing the factual burden on the students, with some honourable exceptions, most of the contributing departments felt that others should reduce their requirements. This was a major reason for determining upon a centralised, revolutionary model of change. The group that determined the cases that should be studied was essential. It comprised a small number (varying between 5 and 10) of clinicians, each of whom was respected in their own right. After much debate a list of around 200 cases was arrived at, half of which would form the focus of problem-based learning scenarios (to ensure mastery of the basic biomedical and social science underlying the patient presentations), and the other half were to be observed, discussed (and recorded) in the clinical setting.

From the very beginning it was realised that the PBL work that the students did would need to be supported by a series of resources, including, but not limited to, lectures, delivered by experts. We also decided to open a human anatomy resource centre, where students could observe dissections and models, this replaced formal anatomy dissection. Although we are confident of our current students' knowledge of practical anatomy, this has been one of the more contentious changes. The other side of this coin is that, although we have decreased the amount of basic science we expect the students to learn during the first two years of the programme, we expect them to continue learning it in the clinical context throughout their University careers – and final examination papers still include questions in basic anatomy and physiology, just as second year examination papers include clinical questions.

The reformed curriculum is centrally organised, is based around a problem-based learning philosophy, with no preclinical/clinical divide. Students are expected to master the information needed to diagnose, understand and manage patients with around 200 common or important presentations. The programme includes explicit training in clinical and communication skills, early clinical contact, 30% of the curriculum delivered in community settings and a final year assessed entirely by portfolio.

The radical difference between the two curricula meant that a process of revolution, rather than evolution was necessary. The major change in philosophy was to shift the responsibility for learning onto the students, giving the academics the responsibility for ensuring the resources and support systems were in place. Bland and colleagues have shown that smaller scale changes have a greater chance of success (BLAND et al., 2000b), our difficulty was that the programme had fragmented over the preceding century, and the existing clinical and postgraduate commitments of individuals within departments meant that there was no clearly identifiable cadre to support change.

The design team had to consider what would be defined as success – and determined that it would be a doctor who would be prepared for their pre-

registration house officer post (now called „Foundation year 1“ in the UK). In consultation with active clinicians in both hospital and community settings, we negotiated the actual mix of cases which students are expected to be able to diagnose, understand and manage when they enter their postgraduate career. This means that some things that had previously been covered in the undergraduate programme are now tackled in the postgraduate setting. Other elements of clinical competence (such as clinical and communication skills) are developed and refined explicitly early in the student's undergraduate career, and refined.

The other area where we have encountered some resistance is that we do not publish a syllabus (beyond the generic one given by the General Medical Council). Instead, we ask the students to post their learning objectives for each module on the web-based virtual learning environment. We use the list of actual learning objectives in two ways:

- 1) To enable us to set appropriate questions in the examinations.
- 2) To compare with the intended learning objectives (derived by Faculty).

We can then see whether we have chosen the right mix of case presentations to guide the students, and adjust them accordingly. Finally we have had to remain very flexible in the face of evaluations of our programme by students, Faculty and external observers. We have changed the programme, at the level of individual cases/presentations, and through rather more dramatic changes in the structure of the programme, to make sure that our students are as well prepared as possible for the clinical environment.

## 4 Did it work?

The first students from the reformed curriculum graduated in 2001, and some are already in consultant posts. There has been a substantial research endeavour to evaluate the outcomes, and determine if our students are different from before, and whether that is better or not. The key performance indicator was that our students should be better prepared for the life and work of a junior doctor, and this has been resoundingly met (CAVE et al., 2007).

More precisely we have found that our graduates perform at least as well as those from the traditional programme (WATMOUGH et al., 2006a; WATMOUGH et al., 2006c; WATMOUGH et al., 2006d), and that they are more confident in their abilities (WATMOUGH et al., 2006b; WATMOUGH et al., 2006c). An interesting observation in several of our studies is that students from the traditional curriculum were more confident about their knowledge of basic sciences than those from the reformed curriculum, although their actual knowledge base was very similar (WATMOUGH et al., 2006b; WATMOUGH et al., 2006d; WATMOUGH et al., 2006e).

It is still uncertain whether the benefits of the change are due to the process of change, or change itself, but a critical review of the literature has led to the view that the problem-based approach may have benefits, beyond those of streamlining the curriculum and allowing more time for skills development (KOH et al., 2008; NORMAN, 2008).

## 5 Conclusions

Like all university programmes, the medical course at Liverpool is still evolving and subject to scrutiny from all stakeholders. We place great emphasis on evaluation and reflection both for the students and for the programme managers. It is clear to us, that, although the revolution through which we managed change was difficult, and at times painful, we achieved far more than we would have done by evolution. The end result, however, is medical graduates who are much better suited to medical practice than their forebears (WATMOUGH et al., 2006a; WATMOUGH et al., 2006d; CAVE et al., 2007).

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