

The changing face of education

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Introduction

Having recently stepped away from leading the undergraduate medical course at Bristol I have reflected on changes I have seen over the past 12 years. In the old days we learnt by a process of immersion, being dipped in various clinical experiences, which were meant to be comprehensive but were haphazard, we got knowledge from textbooks and from each other. We did exams in big halls with lots of writing, and saw patients and took histories from them, and then attempted to relay that to our examiners, and trying to make sense of what the patient had told us. After all that, we were told we were good enough or not, and if so, we were allowed to the next process of knowledge acquisition and then review.

Now, it's all changed. Every learning exercise has a learning outcome, and if something isn't going to be examined, it's worth nothing. More experienced colleagues try to remind students that people that patients aren't the sum of several learning outcomes and that the biggest exam in the curriculum will start after you have passed your finals.

Nonetheless, the changes are here to stay ... at least, until they are changed. But what does medical education look like in the 21st century in a developed country. I think I would divide this subject into several subjects' areas: Teaching in clinical situations; Assessing knowledge and clinical skills; Ensuring and assuring a college of teachers; Keeping it all sewed up together. Before you read anymore, you should probably read a paper written by David Mumford, which gives a succinct outline of the structure we currently use to underpin our teaching (Mumford 2007).

Student input and involvement.

This was not one of the pillars of the new system as it was designed. This one just morphed, like Topsy. This was partly because we allowed it but the big driver in this was the ongoing poor results that the medical school received each year in the National Student Survey. The results were and are public and consequently the senior team in the University stressed the importance of improving them. Despite that, many academic clinical colleagues refused to accept the results as being meaningful and would not engage in any change of practice that might improve this – let us call them the establishment. At the time, a major student source of dissatisfaction was feedback after assessments. The established view was that the exam mark was sufficient, the students wanted the exam papers and much more information. After years of negotiation, we developed a process whereby an individual student was told their mark initially as soon as possible, and then within a few weeks, very detailed feedback on their performance by subject area with the exam. This sort of process was repeated across all the assessments, written work, Objective Structured Clinical Examinations (OSCEs) and so on.

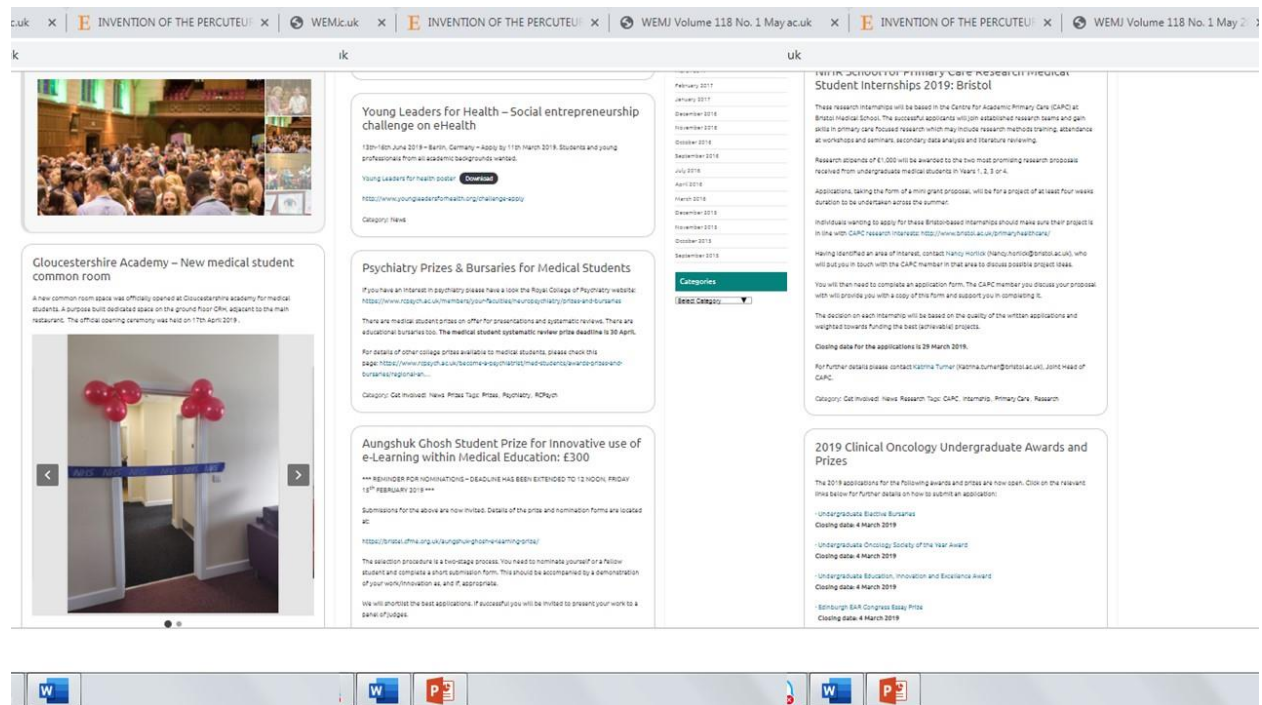


Figure 1: Recent images from the medical school blog

In addition to these changes in openness of assessment performance, there was also a drive to have better communication between the medical school and the average student. Harnessing social media and platforms was important in this – with the introduction of a webpage for the Medical School on Facebook, and a monthly newsletter which was initially emailed to all and latterly posted on the Facebook page and on a blog, accessible to students and staff (<https://bristolmedicalschoo.cfme.org.uk/>). Images from the blog are shown in Figure 1 and illustrate the range and variety of material presented.

Teaching in clinical situations

History taking, examination skills and clinical skills such as venipuncture have become much more technical and technological. History taking is now first delivered in simulation, with opportunity for feedback from peers, generally with expert patients or actors who are able to give repetitive and consistent rendition of their complaints to ensure consistency (and of course patients aren't consistent I hear you say – but for students as they start, identifying familiar clues is important to start with and to build confidence). Examination skills can be taught with actors, in simulation settings or on real patients – as a progressive development. Models for undertaking clinical skill training are available – especially for venipuncture – and a new departure has been the use of clinical training associates (CTAs) for developing skills in vaginal and rectal exams, with students being given “live” feedback on their performance in the technique in question. The use of CTAs has not been without controversy. Some curriculum leads have been pioneers in these techniques, others have been obstructive and in opposition to their use – citing these to be akin to prostitution of a form, paying people to be examined in this way. Student feedback is very positive about this, although real patients still need to be examined as part of the learning process (Armitage and Cahill 2018).

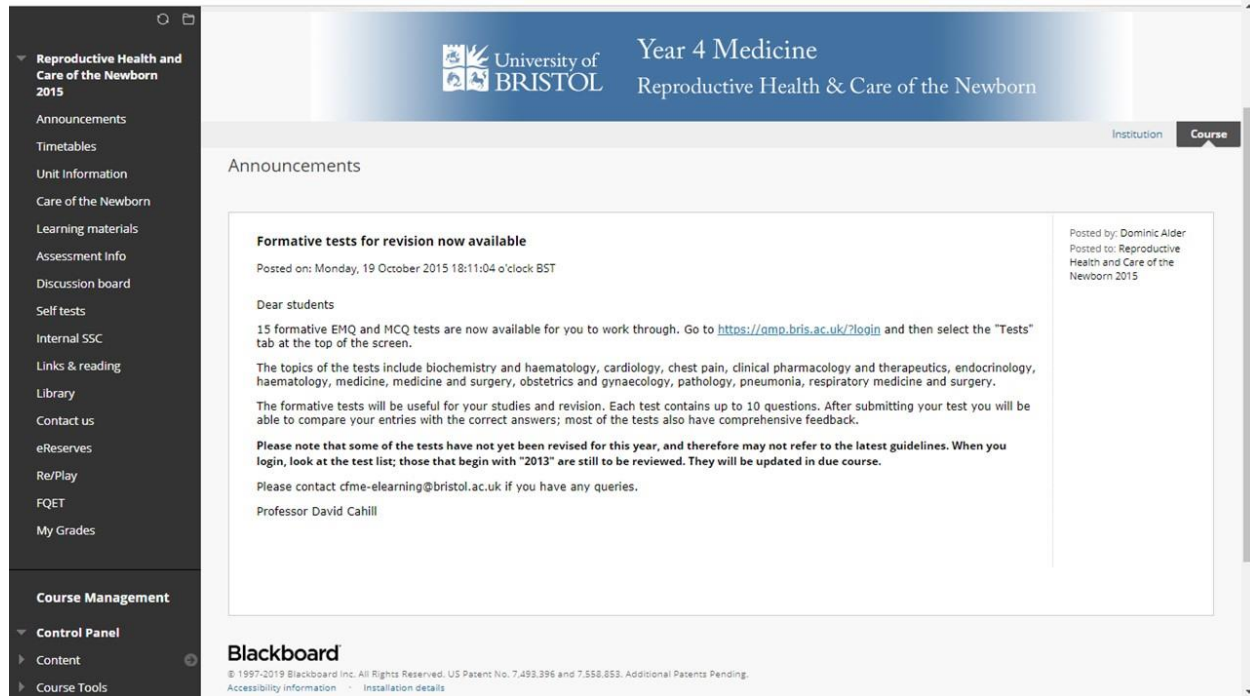


Figure 2. Screenshot images of a teaching module from the undergraduate programme

As well as ensuring that clinical skills were uniformly taught, it was important to ensure that teaching of knowledge was consistent and even across the academies. Content was standardized and distributed to students and to teaching staff and made available on the University’s online platform for teaching, Blackboard (Blackboard Inc., Washington, DC, USA). Sample images from one teaching module can be seen in Figure 2.

Assessing knowledge and clinical skills

This is becoming more technically demanding as we move away from marking essays with all the potential for subjectivity, and biases from tiredness, and the like. Now, most knowledge-based assessments are dependent on some form of multiple-choice questions, and these have moved away from the true / false format to extended matching questions and more recently to *best of 5* questions which require more developed skills in writing as well as in marking and making a judgment on determining if a student’s performance is satisfactory. Writing skills are more related to testing not just pure knowledge but its application and interpretation within a clinical environment. This is quite different to the older question format, and questions generally need to be reviewed and refined to avoid some of the errors in this new format of question writing. Deciding on a pass mark for this form of assessment is more than picking a pass mark of 50% - that mark that seems to denote a pass in medical examination the world over. Instead the process at arriving at a pass mark is determined by the use of a complex system of standard setting, which uses a panel of judges (generally fairly expert in the field being examined) who are asked to look at each question within the light of a specific question (for instance, for Finals) “how many barely competent housemen / foundation year doctors / interns would get this question right?” It then uses some mathematical formulae to generate a mark, and if the range

of determined marks is not too wide, that can be accepted as the pass mark. If the range is wide, then some horse trading must go on to get people to give and take their marks closer to get an agreed pass mark.

Clinical skill assessment is now assessed using formats of the OSCE and there is debate as to long to examine students for in this process and how many stations they need to be examined it. You can read some of this debate elsewhere. The long case style of assessment has been viewed negatively by the undergraduate assessment section within the general medical council. In Bristol, we tried different methods to enable us to continue to use this method which we felt was a clinically very relevant exam, but we were unable to demonstrate satisfactorily that it was reliable and consistent and consequently, we were forced to drop it.

Ensuring and assuring a college of teachers

The key elements in David Mumford's paper to supporting teaching in different ways were

- I. having both in-Bristol and out-of-Bristol campuses for clinical education
- II. innovative partnerships with local health care providers
- III. local leadership of educational delivery, and
- IV. the recruitment and training of new cadres of clinical teachers

In practice this meant devolving responsibility for teaching the curriculum to local "campuses" (called Academies) with individuals on site responsible for the delivery of teaching in named areas such as general medicine, rheumatology, gynaecology, child health for example. These Academies were geographically located in the nearby district general hospitals (Gloucester and Cheltenham, Bath, Swindon, Weston-super-Mare, Bristol South and Bristol North, Somerset (Taunton and Yeovil) and psychiatry and primary care/general practice being located in the local acute hospital administratively, while delivered in practices and inpatient and outpatient services). There are financial arrangements in place to support the allocation of time in the job plans of those individuals just named, to ensure they have the space in their week to deliver their teaching. This was also meant that a programme of teacher training has been put in place with regular annual updates to maintain currency as well as some mandatory things such as assessment training in advance of undertaking OSCE examinations, for example. Each hospital site tends to be a unique "academy" and each is led by an individual, thus far always a doctor, who takes responsibility for delivery of teaching in their site and who is appointed by both the university's medical school and by the hospital's medical leaders, representing as far as possible all the "stakeholders" who contribute to the undergraduate teaching.

Challenges have included the need to find successors to posts when individuals retire or leave, the difficulty of ensuring that funds do indeed flow into departments to ensure that finances support the allocation of people's time, the occasional (but likely to increase) tendency for small parts of clinical services to be provided by private (non-health service) providers, trying to ensure that quality and quantities of teaching will not be diluted or lost by these changes.

Keeping it all sewed up together – quality assurance

To ensure that this complex process continues to deliver what is expected of it requires an underpinning of quality assurance. This is made up of student feedback, visits by teaching leads to clinical settings, collation of assessment results in written and OSCE examination to individual academies (with comparators to others), relatively formal annual visits by the senior team in the medical school with provision of structured data on teachers' and student feedback, together with meeting with the senior teams in hospital settings, inspection and review of residential and teaching accommodation.

All those data are made available to the general medical council when they visit, and the data also underpin annual reports from the medical school to the GMC.

Conclusion

The proof of the pudding, it is said, is in the eating. So, have all these changes made any real difference? It would appear so. GMC inspections do not grade medical schools with a mark – but the 2008 to 2016 was marked by a shift from 3 required and 10 recommended changes in 2008 to two requirements and one recommendation, with areas of good practice and things being noted to be working well in 2016. Graduates of the University of Bristol's Medical School have high rates of acceptance for their first place in foundation year posts. National Student Survey data are published as harder scores which can be easily compared – in 2017, Bristol's overall satisfaction with the programme was 95%. The average satisfaction rate for all UK medical schools is 87.5%, and the score of 95% meant that Bristol was ranked in 7th place in the UK. The scores for *Assessment and Feedback* was 71%, compared to the UK average of 64%. In 2007, Bristol's score for assessment and feedback was 20%, in 2010 it was 24% and in 2016 it was 55%. Other surveys domains were also better than the UK average for medical schools: these are *The Teaching on My Course, Organisation and Management, Learning Opportunities, Academic Support, Learning Outcomes* and *Student Voice*. These external measures of performance would support the view that the quality of education and student experience has improved significantly. Somewhat more historical data from the various Royal Colleges show that Bristol graduate performance at Part I examinations of the Colleges' professional examinations show well above average amongst UK medical schools.

References

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- Mumford, D. B. 2007. 'Clinical academies: innovative school-health services partnerships to deliver clinical education', *Acad Med*, 82: 435-40.