PROBLEM-BASED LEARNING

The new paradigm of medical education

Tom Poyser

When the Journal asked the fledgling Medical School to explain to the interested observer and the sceptic what the concept of Problem-Based Learning (PBL) meant to those staff members who might have to adapt their teaching methods, Tom Poyser's name came up. Tom is a final year medical student at Liverpool who took a year out of the course to study International Health at Leeds. The Journal is pleased to publish this personal account of his experiences of the PBL curriculum at Lancaster, where he has been impressed with the personal nature of the teaching and the sense of involvement that students have with the practice of medicine. Minor editorial changes have had to be made to correct Tom's misunderstanding that Lancaster was a 'quiet' medical community before the arrival of the medical school!

For those of us who are looking for reassurance that the modern medical curriculum delivers an education comparable with the traditional one, here is a personal view that reflects the experience of a student and his peers.

INTRODUCTION

More and more medical students are coming to Morecambe Bay. The hospitals are becoming teaching hospitals. Staff now have to share their time between clinical and teaching commitments. I am one of the students who are currently in Morecambe Bay. In fact I was in the first set of students to come up here, and after taking a year to intercalate in Leeds I decided to come back.

I decided to come back because of the enthusiasm that the doctors here have for students. The atmosphere of a district general hospital is different from that in large teaching hospitals, but instead of being a disadvantage I have found the personal nature of the teaching here to be pleasant and informative.

When the Journal approached me for this article I suggested that I describe informally my experiences as a medical student. I found this much harder than I initially thought, so I asked a friend to read it and make some suggestions. This brought up even more issues than I can list, mainly because it was easy for me to talk about the many issues surrounding medical education and get off the topic that I was trying to tackle. A big difficulty for me was that I am not only representing myself and the community of medical students here in Morecambe Bay, but several cohorts of junior doctors. I felt that I might be creating rifts where none existed.

But what was I trying to say?

AIM

The Journal wanted a piece of work that convinced senior clinicians who were unsure about the modern approach to medical education that it worked just as well as the old style of teaching, and that medical students educated under the new curriculum have the skills to make good doctors.

WHAT IS PBL?

You have probably heard the term thrown around, and you have probably got at least some idea of what it means. But is it just another three-letter acronym in a profession that already loves to shorten sentences into sound bites? PBL means 'problem-based learning' and it is not so different from how you have learnt in your professional careers. I have been told countless tales by doctors about '*when I was an SHO in (insert specialty) there was this patient with (insert disease) who "went off". There was no Registrar on call so I had to deal with them. After four weeks of this I had become really good at managing patients.*' There you have it. A problem and you learnt from it. But instead of having this approach after you qualify it is the method by which we learn as undergraduates. A written problem on a page is unlikely to be quite as memorable as a child you resuscitated from the brink of death, but the approach is the same. It makes students begin to think in the analytical way they will need to in order to manage patients, in other words, to solve problems.

HOW DO WE DO IT?

I suspect you are wondering how we spend our time if we are not sitting bored in lectures for a large part of the week. PBL works in small groups guided by a professional. Their purpose is to make sure the group stay on the subject, but not to be didactic in any way. The group discusses a problem that is presented to them, normally a clinical case in a social setting. Everything the group knows about the condition and its relevant anatomy and physiology is revised and then the group collectively decides what new knowledge is needed. The group meets again after a week having (hopefully) learnt the new material, and the case is re-discussed. It doesn't always work out, especially at the beginning, but after a while, when the students and tutors are used to it, the sessions become more and more constructive. The way in which the course is organised means that each year similar topics are discussed, and new knowledge is added to old. Slowly over the five years a complete picture is built up.

This simply covers the same ground as the old course, but instead of getting the knowledge in blocks, in a year you get a little clinical skill, a little basic science, a little sociology and then the next year you add to it.

The one thing we learn that I think is very different is that we have to quickly become very adept at accessing large amounts of knowledge, and refining where we look to make sure what we learn is valid and at the right level.

A little evidence . . .

I know there are cynics out there. I even know there are cynics within the student body who are being educated. And a certain part of me understands the apprehension about the way we are taught; but this inner uncertainty is for me a reflection of something that I have learnt at medical school. I, like many of my colleagues, am my biggest critic. If you think that you criticise me for not knowing in which branch of the vestibulocochlear nerve an acoustic neuroma typically arises, that is nothing. I criticise myself more, much more. But instead of leaving it there, letting it get me down, I and my colleagues will go and correct that mistake and learn from it. I think that is the new curriculum's greatest strength. We are aware of our limitations, but are prepared to push them and open ourselves to as much learning as possible. This has been proven to be the case. PBL-trained students are more motivated to learn than their traditionally-trained counterparts⁽¹⁾. So what? More motivated to learn, maybe, but do they know any more? In fact, PBL-trained students have no less knowledge than traditional students⁽²⁾.

Clinical governance is key to the future of the medical profession⁽³⁾. It has been shown that PBL-trained students are much more prepared to continue learning into their professional lives than students trained traditionally⁽⁴⁾.

In 1993, the government produced a document entitled 'Tomorrow's Doctors', which was revised and re-published in 2002⁽⁵⁾. This document outlines the key principles to which all medical schools must adhere. One of the central ideas is that a student has responsibility for their own learning,

“Teaching and learning systems must take account of modern education theory and research.” ⁽⁵⁾

and that medical education is not fixed, as in the past, but fluid and adaptable to new practices.

Personal experience . . .

Although I have been chastised for my lack of basic sciences by seniors, I don't think that this is any less than medical students in the past. I have been involved in conversations with doctors who could not now remember all the steps involved in the Krebs cycle and have never used it in their professional lives. I have also heard consultant surgeons tell me that they always attended anatomy classes hung-over, and only really learnt anatomy once they had qualified.

A colleague of mine who intercalated in anatomy found that the intercalating medical students' level of knowledge was no less than that of the third-year anatomy students, taught under the traditional lecture-based system. We are of course talking about a self-selected group of people who are highly motivated to learn and interested in the topic, but they have been taught using the same methods as any other student. So if they have learnt all they need too, haven't others?

Even more interesting was the fact that after lecture-based anatomy teaching, the medical students often used PBL methods to consolidate their learning, using exactly the same techniques as they had been taught to use. We have maybe not been taught a huge volume of factual information and

asked to regurgitate it. Instead we have been taught how to efficiently learn what we need. Maybe this is a useful skill. Even the most experienced consultant may have to look up Von Hippel-Lindau disease.

I have also spoken to medical students from many medical schools around the country. The courses are generally similar, favouring an integrated approach and moving towards PBL as a tool for learning. As a student who decided to intercalate myself I came into contact with many students who, like me, intercalated at a different university. They all had similar levels of knowledge, and had shared many similar experiences as I had.

Interestingly, showing a few friends my fifth-year portfolio, they decided to copy the approach used by Liverpool, as they thought it was superior to the way in which their own medical school tackled the problem.

Two areas in which I believe we are better trained than ever before are ethics and communication. This may have been in response to a more litigious society, or simply recognition of a deficit in medical education. The fact remains that doctors who are currently trained have to understand much more of the social dynamics that underpin even the simplest of consultations than ever before. Even though this can sometimes be as dull as an anatomy lecture, it is a useful skill.

We are also constantly challenged by complex ethical dilemmas. Even though in most practice common sense will provide most of the answers about ethical issues, it is essential to challenge beliefs with more complex questions in order to stimulate your thinking and show your limits in order for good practice to be achieved.

I used to think that doctors had a bottomless well of knowledge. To an extent this is true, and I am constantly inspired by the huge wealth of experience collected by them. But I also know that each specialist is the guardian of a career's worth of experience. No one doctor can have all this knowledge, so it is shared in meetings and informal conversations. As students we welcome learning essential clinical knowledge. As I have already said, it is impossible to remember everything you are taught, but a critical fact about paediatrics, or a trick about interpreting a chest film would be most welcome. Some of my most rewarding experiences have been when I have been asked to be involved in someone's care as a junior health professional instead of being viewed as a piece of baggage to be towed around.

A way forward . . . ?

I think that there is certainly much to learn from changing systems from traditional to PBL-based. Maybe the pendulum has swung too far towards PBL, but only in response to it being too far focused on traditional elements. What needs to happen is an evaluation of the strengths and weaknesses of each method of learning. A study showed that students who had learned through lectures were better at answering multiple choice questions, but PBL students were superior at taking OSCE exams⁽⁶⁾.

Maybe the way forward is to use each method of learning when it is most advantageous for the medical students of tomorrow to have the best chance of success. Each style of learning can complement each other and impart a different segment of a complex whole.

As for the medical students of today, I am glad I was taught in a PBL style. Okay, it has disadvantages, but every

system has, and I feel that my experiences, however brief, have for the most part been positive.

NOT A SHIELD

So far I have almost whole-heartedly supported PBL as a method of learning because I believe it does work. I do think there is a temptation on the part of both students and doctors to use it as an excuse. 'Sorry I don't know that, I am a PBL student' is not an answer. It is certainly a justification for not knowing it when asked the first time. But it should be followed up by applying the methods we have learnt to any problem we encounter.

DOES IT WORK?

In order to answer that question fully we must be prepared to wait until the students and junior doctors of today take up senior posts; but there can be interim evaluation, and this falls on juniors. The questions I ask of the senior doctors are: 'Has the hospital ceased to function?', 'Does it run as it always has?' and 'Are you unhappy with your junior staff?' I am pretty sure that the answers to the first two questions are 'no' and 'yes'. I would not like to pre-empt the third but it is something that you should consider. And that brings me to my final point.

We are the product of a new system of education. Yes it is different, but it is not inferior. The focus of our skills has changed from your own, but that does not mean they are irrelevant to contemporary medical practice. We are your colleagues of the future, and we are willing to learn from you.

Instead of criticising the way in which we are taught, help us to become the doctors with whom you would like to work.

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A typical PBL scenario for a 4th year student studying surgery

The clinical case: a road accident

A paramedic team bring in three young men to A&E, from a serious road traffic accident in central Liverpool. The story is obtained from the police that they had followed them after they were seen running from a drugs raid in one of the clubs. After following them at high speed their car had collided with an articulated lorry and overturned. The driver and the rear passenger had been thrown out of the car. All three were agitated when the paramedics arrived; the driver was semi-conscious and confused.

On initial assessment by the triage nurse in A&E, Dave, the driver was quiet, pale and confused. He had obvious injuries to both lower legs and was moaning about pain in his left hip. John was drunk, semi-conscious and combative. He was bleeding heavily from scalp and facial wounds with an obvious boggy swelling on his left scalp. He had obvious major trauma to his left arm and leg. Mark, the second passenger, was abusive and smelt strongly of alcohol. He had multiple facial abrasions and his left ankle was obviously deformed. He kept insisting, however, that there was nothing wrong with him and he didn't see why he should stay in hospital.

The case is then studied with respect to the following topics:

Core cases associated with this PBL scenario

- Alcohol misuse
- Drug misuse
- Fractures
 - Clavicle
 - Rib
 - Tibia
 - Femoral neck
 - Colles'

Some examples of possible learning objectives (not a comprehensive list), listed under the appropriate headings.

Structure and function

- What is involved in the pre-hospital assessment of a trauma casualty?
- How do alcohol and drugs affect the assessment and management of this patient?

Individuals, groups and society

- What is the coping strategy for a patient and their family undergoing a traumatic event?
- When might it be appropriate to stop a resuscitation attempt on a patient?

Population perspective

- What is the incidence of road traffic accidents in the UK?
- What is the approximate cost to the NHS?

Professional values and personal development

- What procedures can an ambulance technician and paramedic carry out?
- What are the ethical problems caused by refusal of treatment?