

# Is there a link between problem-based learning and emotional intelligence?

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**ABSTRACT** A brief description of problem-based learning is given and reference is made to the difficulties in demonstrating its value in terms of 'accumulated knowledge' with respect to the literature. The author suggests that problem-based learning may be a suitable curriculum component for developing a student's emotional intelligence.

**KEYWORDS** Emotional intelligence, medical undergraduate, problem-based learning

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## AN OVERVIEW OF PROBLEM-BASED LEARNING

Problem-based learning (PBL) is now a familiar component of many medical programmes. Howard Barrows<sup>1</sup> has set out a description of the process, together with the history of PBL. Problem-based learning is a formal process, arranged by a medical school, to promote learning. Students are active in discussing clinical scenarios, usually in small groups. A tutor is present to facilitate the process of learning and does not normally adopt a didactic method of teaching but uses a style of facilitation that builds on the prior knowledge of the students. The tutor guides students through a constructive process towards establishing new learning objectives. Edinburgh's College of Medicine, for example, insists that the students pose the learning objectives as questions, as this helps to clarify issues and supports the process of enquiry. In its pure form, the curriculum is defined by the faculty and described in a series of problems or clinical scenarios, rather than in a series of lectures. In some programmes (sometimes referred to as a hybrid approach), the problems are used to integrate the content in a clinically relevant scenario.

Where PBL is used, the medical programme usually has a definite structure of modules and blocks. Normally, PBL is used in the early years and gives way to traditional clinical styles of teaching in years 4 and 5. Overall, the aims and objectives, as well as final outcomes or competencies, are broadly similar to other courses which in the UK are determined by the recommendations set out in *Tomorrow's Doctors*.<sup>2</sup>

McMaster University in Hamilton, Canada, is acknowledged to be the pioneer of PBL in medical education, and early adopters include Maastricht in the Netherlands and Newcastle in Australia. In 1996, three UK medical schools – Liverpool, Glasgow and Manchester – adopted a PBL approach to their curriculum. These schools all received

the highest scores when reviewed by the General Medical Council and in a report from the Quality Assurance Agency.<sup>3</sup> Other UK schools, including Edinburgh and Newcastle upon Tyne, include PBL as one of several approaches to teaching and learning. Problem-based learning is the preferred choice of the new medical schools, for example Norwich and Peninsula, and has been adopted by the graduate entry programmes of St George's and Leicester Warwick. However, PBL does not meet with the approval of all schools, and Bristol has been critical of both *Tomorrow's Doctors* and PBL.<sup>4</sup>

## THE CLINICAL SCENARIO

The problems or clinical scenarios in PBL are the basic units of content that a faculty wants students to use as a framework for their learning. Collectively, the scenarios should direct the students to the main programme outcomes. The University of Liverpool, for example, has a series of scenarios that follow two passes of the human life cycle. The scenarios used by the University of Glasgow incorporate the most common and important presenting symptoms, while the University of Edinburgh has scenarios that match the modules based on main body systems.

The scenarios are normally written to an agreed format or template, covering a wide range of issues to encourage students to explore the breadth as well as the depth of the 'medical spectrum'. Scenarios are normally written in accordance with the following conventions:

- They are created by a multidisciplinary team involved with contemporaneous modules.
- They focus on the course learning objectives.
- They allow students to integrate important aspects of their current learning.
- They encourage students to explore the topic through a range of disciplines.
- They have a narrative that is authentic and realistic.

## THE SEVEN STEPS

Problem-based learning tutorials usually follow a version of the seven-steps sequence developed at the University of Maastricht:

- 1 **Introduction:** read the case, define terms and clarify uncertainties.
- 2 **Definition:** define the problems or issues within the case.
- 3 **Analysis:** brainstorm the issues to establish what is already known in the group.
- 4 **Synthesis:** review the analysis and organise it into a meaningful structure.
- 5 **Prioritise:** define the learning objectives in the form of five or six key questions.
- 6 **Investigation:** in private study, work through each question and learn sufficiently well to be able to discuss the questions.
- 7 **Comprehension:** as a group, agree an answer to the questions through discussion.

The process of group discussion challenges the student to pass through three important stages of learning: finding out and committing information to memory; explaining to others what has been learned; and listening to others, thereby testing one's own understanding. As Wood<sup>5</sup> states: 'Group learning facilitates not only the acquisition of knowledge, but also several other desirable attributes such as communication skills, teamwork, problem solving, independent responsibility for learning, sharing information and respect for others.'

## EVIDENCE IN THE LITERATURE

Problem-based learning is one aspect of medical education that continues to attract enormous interest in the literature. Enter 'problem-based learning' into Google and more than one million items will be identified. New articles are published at a rate of more than 4,000 per month. In 2004, the Campbell Collaboration<sup>6</sup> conducted a pilot of a systematic review and meta-analysis of the literature. Its aim was 'to establish the evidence provided by existing published reviews about the effectiveness of PBL'. The report highlights the difficulties of drawing general conclusions about the effectiveness of PBL.

In the first instance, the samples used are very different because of the variation in the medical curricula themselves, and different methods and tools used. This underscores the difficulty of gathering evidence in the context of education: the use of the double-blind trial to test a single organic intervention does not apply in research into PBL. The difficulties are illustrated in the report by the question of effectiveness. The report identifies 12 studies that evaluate accumulated knowledge assessed by multiple-choice questions or, in the US, the National Board of Medical Examiners. Within the 12 studies, there are 39 effects (or question formats) that test performance abilities, such as critical reasoning,

problem solving and decision-making. Of these, 16 show PBL favourably and 23 show other courses more favourably. However, one wonders how valuable this summary really is when the nature of the actual courses are taken into consideration, and when courses included for comparison may be two years of medicine, seven weeks of physiology or three months of headache diagnosis and management. The arrangements for contact time are also varied: some are unreported, others are for 23 x two hours of PBL or conventional courses, another has 12 hours' PBL per week compared with 25 hours' conventional teaching per week, while a two-month course on depression in the elderly is described as 'on-line asynchronous'. This explains why the authors of the report refer to the 'fruit and vegetable' analogy of comparing studies that are very different.

However, a recent review by Koh et al.<sup>7</sup> of 102 articles reports that 'problem-based learning during medical school has positive effects on physician competencies, especially in the social and cognitive dimensions'. In their conclusion the authors call for research that looks beyond knowledge and considers the effects of problem-based learning in other dimensions.

## EMOTIONAL INTELLIGENCE

Although accumulation of knowledge is an important factor, there are other elements of a student's medical education that are also significant (as mentioned by Wood<sup>5</sup>) but not often considered in relation to student progress. One area of research interest is the development of the affective domain,<sup>8</sup> and particularly the development of an individual's personality and emotional intelligence (EI).<sup>9</sup> The term 'emotional intelligence' is usually attributed to a doctoral thesis written by Payne.<sup>10</sup> But it was Salovey and Mayer who in 1990, defined EI as 'the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions'.<sup>11</sup> Several authors have written about EI with respect to the performance of physicians, and it has been shown that high levels of EI in clinicians are associated with increased patient satisfaction.<sup>12</sup>

Indeed, the Jefferson Physician Empathy scale<sup>13</sup> is now frequently used to measure one aspect of a physician's personality. Research into the five personality traits<sup>14</sup> – openness, conscientiousness, extraversion, agreeableness and neuroticism – has indicated that a significant relationship exists between conscientiousness and academic success.<sup>15</sup> More significantly, a longitudinal study of the psychological well-being of doctors by Teissen et al.<sup>16</sup> has shown that those with a predisposition for low extroversion, high neuroticism and high conscientiousness are at risk of developing clinical stress in their professional life. Further evidence about the relationship between personality and progress in

undergraduate medical education is being investigated by Lumsden et al.,<sup>17</sup> with a view to informing decisions about admission and selection criteria.

Given that PBL places students in a situation where interpersonal skills are important, the question arises as to a possible link between PBL and emotional intelligence, and research into this area may reveal some important findings. More specifically, is PBL a useful forum whereby students can begin to understand the characteristics of their own emotional intelligence?

The PBL programme at the University of Edinburgh includes an exercise involving student-peer appraisal. The students are asked to provide structured, constructive

feedback and award a notional 'mark' on how well their peers have performed in PBL. A correlation analysis of EI disposition with peer ratings in first-year PBL groups<sup>18</sup> seems to suggest that the 'best' peer is regarded as someone who scores high on EI, extraversion and openness.

Since it has been suggested that a certain disposition in doctors may be a risk factor for developing stress in later life,<sup>16</sup> it would seem to be important to establish if involvement in PBL activities is beneficial to those students with a disposition towards low extroversion. This is one area of PBL that the author believes is worthy of further investigation.

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