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Roles and responsibilities of the problem based learning tutor in the undergraduate medical curriculum

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Over recent decades, many countries have recognised that traditional undergraduate medical education must change substantially in order to match the changing healthcare needs of the population and become more centred on the students.^{1,2} This changes the role of medical educators. Problem based learning is one approach to reform that has international credibility. Numerous undergraduate medical curriculums have incorporated problem based learning; in 1992-3, 27 North American medical curriculums were using this approach, 14 of them across the board.³

In 1993, three systematic reviews of problem based learning in

undergraduate medical education were published. These reviews, spanning 20 years, were cautiously optimistic about the short term and long term outcomes of problem based learning compared with traditional approaches.^{4–6} They found that the results for students' evaluation of the programme; students' attendance, mood, and clinical performance; and faculty attitudes were better for problem based learning—even allowing for different definitions, curricular context and costs, and study design in the evidence base. Evidence about the coverage of basic science and curricular costs is conflicting,⁵ but Berkson believed that the students' enjoyment⁴ of the adult learning route to competence⁶ countered these concerns or unrealistic expectations.

Traditional medical schools face many difficulties—from the resistance of staff⁷ to underresourcing⁶—in converting comprehensively to problem based learning. These pitfalls were illustrated in the unsuccessful attempt to convert Otago Medical School, New Zealand.⁸ The pioneering problem based undergraduate medical curriculums originated in new medical schools—McMaster, Canada; Maastricht, Holland; and Newcastle, Australia. Nevertheless, large scale conversion continues, and includes (since the mid-1990s) the first British medical schools—Manchester, Liverpool, and Glasgow. This reflects the recommendations of the General Medical Council² and worldwide imperatives to incorporate theories of adult and problem focused education.

Problem based learning is characterised by certain ground rules.⁹ It is a combination of educational method and philosophy.

Philosophically, problem based learning is centred on the student and on problem-first learning, whereas in subject based learning teachers transmit knowledge to students before using problems to illustrate it. Problem based learning aims to enable students to acquire and structure knowledge in an efficient, accessible, and integrated way. The method involves learning in small groups, in a “tutorial” system. The tutor facilitates the group's self directed generation of learning objectives from triggers in successive case scenarios that set the context (see box). These objectives guide self directed learning between sessions, and then in subsequent sessions students reapply, synthesise, and appraise their learning.

Problem based learning encourages medical educators to rethink and change their educational role away from one in which they predominantly transmit facts. Tutors are “shadowy” figures in published reports on student centred, problem based learning. Their legitimate role can be undermined by wrongly viewing “student centred” as “tutor inactive.” Tutors can also overcompensate for the possible effects of their specialist content expertise by intervening much less than necessary when students’ discussions enter these subject areas. Fear of derailing students’ self motivation must be balanced against the need for timely, thought provoking comments that guide the breadth and depth of learning without imparting facts.

Summary points

- Undergraduate medical curriculums that use problem based learning rather than a traditional approach need a different type of medical educator
- With problem based learning, students working in small groups facilitated by tutors identify their own learning objectives from problem scenarios
- Available evidence indicates that tutors must use their expertise subtly and sparingly, and balance this with an informal empathetic style
- Tutors can gain much from facilitating adult learning, but must move away from authoritarianism and dispensing facts



This paper examines the roles and responsibilities of problem based learning tutors in undergraduate medical curriculums. It explores the expected relationship between tutor and student and what tutor-development should promote, and it discusses who can be considered an “expert” problem based learning tutor and the effects of the tutor’s content expertise.

Goals of problem based learning sessions

The students summarise, in their own words, a case scenario (presented on paper, video recording, or by a patient in person). They then:

- Look for phenomena requiring explanation—by “brainstorming” their ideas to generate and analyse concepts and questions that relate to characters, characteristics, processes, and events in the scenario
- Investigate previous knowledge and experience—by suggesting, connecting, and evaluating explanations for

these phenomena, and discussing (activating, elaborating) and appraising what they already know that is relevant

- Volunteer shared learning objectives—by identifying shared gaps in their understanding of the scenario and prioritising what is feasible to pursue, and often researching these objective between sessions
- Explain the essence of the case scenario—by sharing, applying, and synthesising prior and new knowledge; evaluating critically the evidence collected; and then through separate discussion
- Reflect and evaluate—by discussing the group process and learning, and personal contributions and achievements (including those of the tutor)

Roles and responsibilities of tutors

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The problem based learning tutor is not authoritarian. Barrows and Tamblyn believed that the tutor should have expertise in group facilitation (process expertise) rather than in a subject area (content expertise).¹⁰ Ross disliked the tutorial label; he viewed problem based learning sessions more as professional strategy meetings than teaching sessions.¹¹ In problem based learning,^{12,13} the tutor facilitates or activates¹⁴ the group to ensure that students progress satisfactorily through the problem. According to Margetson, the tutor does this by “questioning, probing, encouraging critical reflection, suggesting and challenging in helpful ways—but only where necessary.”¹⁵ Most new tutors in problem based learning are challenged by the “where necessary” (deciding when and how) part of intervention.

Ways of intervening

From experience at McMaster University, Woods outlined two main, question based ways for tutors to intervene.¹⁶ These are, firstly, to ensure that students approach the problem appropriately and, secondly, by challenging students’ assumptions, to ensure that they reflect on and justify their assertions. A third type of intervention could be added to these—namely, to close each

session by enabling reflection on the dynamics of the group and what has been learned. In addition to understanding the essence of problem based learning and work within small groups, therefore, the tutor must be skilled in facilitation, active listening, motivating learning, and critical reflection. The tutor must not dominate a session with content specific questions and answers that convert it into a tutor led seminar.

Published reports on critical thinking in education provide useful insights. Brookfield advised facilitators of critical thinking against vainly attempting to be perfect tutors¹⁷ or against conveying the view that students can achieve anything in critical thinking through commitment, irrespective of their capacity.¹⁸ Brookfield preferred realism to rhetoric for tutors and students.¹⁸ Similarly, rhetorical claims about problem based learning do it the disservice of allowing critics to portray it as a “free for all,” rather than as an evidence based approach that can be applied flexibly within broad ground rules.

Custodian and guide

The tutor is therefore the custodian of the group process¹⁹ and guide for discovery,²⁰ rather than an information dispensing model of perfection or an overenthusiastic educational cheerleader. The relationship between the tutor and student should develop as one between colleagues. Potentially, however, tutors feel threatened. Those who confuse authority with authoritarianism¹⁵ may feel uncomfortable, unaware that authority is exercised differently, not abandoned. Margetson believed that authoritarian attitudes “are particularly out of place since [the approach] is a participative, co-operative, reflective, critical, and informed educational practice. This requires a radically changed attitude towards students; they are regarded more as colleagues who are novices ... than appropriate recipients of the paternalistic attitudes which are often the norm.”¹⁵

In a cross sectional questionnaire survey of first to fourth year medical students at Maastricht, self directed learning was reported to increase with increasing seniority, and yet students perceived that their tutors’ influence on learning remained undiminished.²¹ Others, however, reported that the tutor’s influence diminished.²² Tutors are

not redundant in self directed learning; their influence is exercised more subtly.

Students' attitudes to learning

Woods used Perry's developmental scale of attitudes to learning²³ to explain to students what is expected of them (table).¹⁶ (Perry's original scheme charted intellectual and ethical development in the college years of American undergraduates attending Harvard and Radcliffe, and showed changing attitudes to learning.) Problem based learning is founded on an appreciation of relativism—that is, that the answer to a question often depends on the context. Students need to work towards at least level 5 in Perry's scale (table).^{16,23} Moreover, tutors should also display these attitudes, practise self directed learning, and acknowledge personal and scientific fallibility, which are all important issues for staff development.

Development of tutors

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Holt believed that “Only as teachers in schools free themselves from their traditional teacher tasks—boss, cop, judge—will they be able to learn enough about their students to see how best to be of use to them.”²⁴ Tutors used to didactic (teacher to student transmission) teaching need reorientation away from dispensing information. Staff development is central²⁵ to a comprehensive curricular conversion from a traditional to a problem based philosophy.^{26,27} Development of tutors should incorporate experiential learning, small group work, critical reflection, and problem based learning itself, echoing two further points.

The first is that relearning teaching in a problem based learning environment may enable a tutor to empathise better with students' emotional struggles, and may help the tutor's personal development.^{18,28} Furthermore, like other facilitators, problem based learning tutors may potentially resemble “psychological demolition experts.”¹⁷ They must therefore be sensitive about students' self esteem while challenging them to justify assumptions exposed by group discussion. Woods advised students to expect to get upset around three to four weeks into starting problem based learning.¹⁶ New tutors should also expect discomfort.

The second point is that problem based curriculums should not squander opportunities for collaborative learning²⁹ between students, faculty, and administration. Even in problem based curriculums, however, tutors may show little awareness of group dynamics and provide inadequate role models.³⁰ Indeed, many of the published reports on problem based learning do not recognise this tutoring as a reinvention from established ideas about group facilitation.

Content expertise and the tutor

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“No educational effort is entirely free from the underlying values of and assumptions of the facilitator.”¹⁷ Research on tutors is relatively scarce and is focused on how the tutor’s content expertise affects the function of the group and the performance of students on assessment. The evidence is also contradictory, as it is compromised by inconsistent use of the term “expert problem based learning tutor” (box). Furthermore, differences in curricular structure and context, study designs, and definitions of problem based learning and content expertise make generalisation difficult. If problem based learning is truly a vehicle for integrating knowledge across subject boundaries in order to understand a clinical scenario, there should be a wider view of the art and science of medicine than the one that currently prevails in the evidence base. Nevertheless, some lessons emerge.

A matter of definition

There is a confusing range of meanings for the label “expert problem based learning tutor” in published articles and reports. Tutors are often labelled “expert” according to their content expertise rather than their process expertise, as defined by:

- Their own or the researcher’s rating
- Different frames of reference—for example for a whole (or a group of) problem based learning case scenario(s)/module(s), or for specific topics/learning objectives within sessions
- Being in a particular discipline (which would conflict with the role of problem based learning as a vehicle for

integrated education)

- Being medically qualified or not
- Being an academic (compared with a non-academic or a student tutor)

Silver and Wilkerson, for example, used tutors' self ratings of expertise for each substantial topic discussed in a problem based learning session for first year Harvard medical students.²⁹ They studied two audiotaped sessions from each of four randomly selected first-time tutors in an 11 week interdisciplinary problem based learning course in pathology, immunology, and microbiology. When their topics were being discussed, the self rated topic experts were significantly more directive, spoke more often and for longer, provided more direct answers, suggested more discussion topics, and presided over exchange patterns that were predominantly tutor to student compared with student to student (despite posing the same proportion of comments as questions, approximately a quarter).²⁹ This small study suggested that tutors should recognise the potential effects of their authority and knowledge. Silver and Wilkerson were concerned that students with dominant tutors might miss opportunities to: prioritise their learning needs, ask and answer crucial questions, and synthesise their learning.²⁹ In a further case study of four learning groups, Wilkerson et al found that effective tutors for self directed learning were those who encouraged active listening, tolerated silence, and only made appropriate interruptions.³¹

Eagle et al, in Calgary's medical school, defined expert problem based learning tutors in relation to discipline—as the authors of the case scenario or those encountering similar patients in everyday practice, or both.³² Questionnaires completed by students were received for 35 of 43 simulated cases. Students with expert tutors generated significantly more (twofold) learning issues, which were significantly more congruent with the faculty objectives, and spent longer studying them. Eagle et al recommended that non-expert tutors prepare by clarifying course goals and case objectives, studying the clinical problem, and talking to those with relevant experience.³² In an isolated problem based learning course within a traditional curriculum, Davis et al found that students with problem

based learning tutors who were content experts (defined as having disciplinary or research expertise, or both, concerning the case scenario) performed better in assessments.³³

Schmidt et al, having previously found no effects of content expertise (which they defined as being medically qualified), reviewed the evidence. They found it to be inconclusive, hampered by small and flawed studies, different definitions, and the extent to which tutors were “warned off” intervention.³⁴ They then studied the outcomes of students’ assessments and ratings of self study time and tutors’ behaviour in 336 problem based learning groups from seven Maastricht health sciences programmes. Effective tutoring was found to need both process facilitation skills and content expertise (defined by the tutor’s medical specialty in relation to a case scenario).³⁴

This evidence is less informative for truly integrated curriculums in which boundaries between subjects are blurred. Nevertheless, subsequent research modelled two prerequisites for the effective problem based learning tutor—so called, “social congruence” (comprising informality and empathy with the students) and knowledge of the subject.³⁵ While tutors with specialist knowledge may impose inappropriately explanations of content on the students,³⁶ those without this may fail to assess correctly the students’ progress.³⁷ Indeed, a tutor’s specialist knowledge helps students most³⁸ when curriculums are too poorly structured for the students’ level of learning,³⁹ but is no substitute for the personal qualities⁴⁰ of social congruence required to motivate students.

Conclusion

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For those pursuing, or considering, problem based learning or other student centred approaches in undergraduate medical curriculums, tutoring has major strategic implications for staff recruitment and reward, staff development, quality assurance, and educational research. Despite a limited evidence base on the determinants of effective tutoring in problem based learning, staff development should ensure expertise in group process, raise awareness of the effects of subject knowledge and role modelling, and support tutors who are unfamiliar with the content of the problem scenario. From

the perspective of personal development, the tutor has much to gain from facilitating adult learning. The tutor's challenge is to forego the gratification of dispensing facts, and walk the tightrope of effectiveness by balancing intervention in the group process between an informal, empathetic style and subtle and sparing use of personal content expertise.

Table

Extract from Woods' representation¹⁶ of Perry's developmental scale (scored 1 to 5) of attitudes towards learning.²³ Used with permission

Aspect of learning	Level 1-2	Level 5
Knowledge	All knowledge is known	Different knowledge is needed in different contexts
Answers to problems	Either right or wrong	No absolute truth; answers are relative, but good answers exist once the conditions are known
Teacher, tutor, instructor	Instructor and books know the truth	Role is to be a guide and source of expertise
Student's role	To receive	To identify the conditions; to choose the best ideas
Assessment	Worried if [examination] format is fuzzy. Asks "What do you expect?" Equate poor grades with bad person	Seek positive and negative feedback on assessment
Preferred task	Memorise definitions	Synthesis; relating ideas between contexts
Difficult task	Decide which of two conflicting authorities is correct. Tell me	Decide on which conditions apply

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Footnotes

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