Techniques in medical education: problem-based learning
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Developing the role of the tutor/facilitator

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Summary
The effective training of facilitator/tutors is crucial to the success of a problem-based learning approach to medical education. New skills are needed to accomplish the change from giver of information to facilitator of learning, coach, and guide. This paper outlines considerations for the design of a tutor training programme and describes the Harvard Medical School programme in detail.

Keywords: education, problem-based learning, US medical schools

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Student activities in a PBL tutorial

- raise questions
- propose hypotheses
- present data from independent study
- set and prioritize study agenda
- teach each other

Box 1

Tutor activities in a PBL tutorial

- listen
- encourage critical thinking
- challenge assumptions
- give feedback
- guide, facilitate learning

Box 2

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* Referred to as 'tutor' throughout this article.

New teaching skills needed for problem-based learning

With the increasing interest in problem-based learning (PBL) in new and progressive medical schools throughout the world,[1] there is a need for faculty to develop new teaching skills. The role of the teacher in PBL is not the time-honored role of giver of information. Rather, the PBL teacher, usually called tutor or facilitator,* must learn to curb the desire to impart all that he or she knows and focus instead on the learning process of the student. The teacher, then, becomes the guide, coach, or facilitator in a student-centered, rather than teacher-centered curriculum.

In almost all variations of the PBL format, whether in preclinical or clinical courses, one faculty member meets with a small group of students (usually five to eight) several times a week during a 'unit' or 'module' of three to ten weeks duration. A healthcare problem, or case, presented on paper, videotape, computer, or occasionally as a real or simulated patient, is the focus of study. The basic premise of these problem-based tutorials is that the students take the major responsibility for their own learning.[2]

In this setting, the students raise questions about the case, propose hypotheses, present data from independent study, set and prioritize study agenda, question and teach each other. It is often a rule that only students write on the blackboard, thus discouraging tutors from giving illustrated mini-lectures. When students write their own lists of questions and hypotheses, it gives them an immediate sense of ownership and increases motivation to pursue information and find answers. When students draw diagrams illustrating their understanding of anatomy or physiological processes, the tutor and their fellow students can immediately see the accuracy of their understanding and offer appropriate guidance.

The role of the tutor

The PBL tutorial is not a time for dispensing information, nor even a question and answer session in the Socratic sense. The role of the tutor is to follow the discussion of the students closely and consider when and how he or she might contribute to their learning. While it may appear at times that the tutor is doing very little, this is an intense mental exercise. Glick[3] describes it thus:

"... a good tutor maximizes tutorial opportunities by being active in a variety of ways: in planning and preparing, in listening, in encouraging critical thinking, in enriching, in offering spoken and unspoken feedback ... and is restrained in the transmission of information. The active tutor should have a plan for each tutorial, but rarely invoke it; should have knowledge, but not unload it; should have questions, but not feel compelled to ask them."

Who will teach the tutors?

An effective faculty training programme may well be the most essential ingredient in the success of any educational innovation, whether at the undergraduate, graduate, or continuing medical education level. To develop a PBL programme, most medical school deans recognise the need for help from professional educators who are conversant with the field of medicine. Such persons are not easy to find. This role can be filled by faculty who are skilled and interested in teaching, or with time dedicated to acquiring the skills and knowledge of teaching and learning. They should not be too bound by what has been taught in traditional education courses, but should have a genuine interest in medical students, good organisational skills and powers of observation, and a sense of diplomacy and collegiality in dealing with faculty. Experience with PBL is a plus. Good staff support for word processing and other clerical duties is essential.

Designing a faculty development programme

Since the adoption of PBL by many medical schools, various models of tutor training programmes have emerged. These include week-long programmes offered by some of the "original" problem-based schools, such as McMaster, Southern Illinois University, University of New Mexico, and Maastricht. Some other notable programmes around the world have been developed at Lindkoping in Sweden,[4] the University of Sherbrooke in Canada,[5] and Xinjiang Medical College in China.[6] In any circumstances, the following basic elements of faculty training must be considered:

- educational goals; the type of physician to be trained and the curriculum content and methods to accomplish these goals
- resources of the institution that can be devoted to faculty development;
- amount of time faculty are willing to devote to training;
- ways to choose and evaluate tutors.

EDUCATIONAL GOALS

It is not surprising that PBL is said to work best within a planned curriculum with clear learning objectives.[1] This means that the medical school must decide what subjects will be in the curriculum and what type of training will be offered, whether for primary care doctors, specialists, researchers, or a general medical education that can serve as a basis for many career directions. Each school must work out the details to suit their own particular goals in their own unique culture and setting. There are by now many published sources of information based on years of experience with PBL, that can be used as models to articulate programme goals and objectives.[7-11]

FINANCIAL RESOURCES

One assumption that can safely be made is that the financial resources available for faculty development are not extensive. In the usual competition of unlimited demands for limited resources, it is often easier to assume that faculty know how to teach. At best, this is a hazardous assumption. There are few, if any, formal educational requirements for becoming a teacher in a medical school. While many faculty do become excellent teachers by emulation of outstanding teachers, or through their own inherent instincts,[12] it is risky to rely on chance to supply a sufficient and uniformly well-trained cadre of tutors.

FACULTY TIME COMMITMENT

Another crucial element is the amount of time faculty are willing to devote to the development of teaching skills. Time is an especially scarce resource among medical faculty who usually have research and patient care responsibilities in addition to their teaching assignments. Nevertheless, it is erroneous to think that effective faculty development can be accomplished with an inadequate time commitment, or with time half-committed, such as in situations where participants are forced to come late, or leave early, and are constantly "beeped out" of training sessions.

CHOOSING TUTORS

In an ideal world, only faculty with proven interest in students and excellent track records as teachers would be chosen as PBL tutors. In reality, willingness to be a tutor is often the main basis for choice. The economic forces in the healthcare field in the US and elsewhere are putting greater pressure on clinical faculty and making it difficult for many of them to choose to spend time teaching medical students. The issue of content expertise comes to the forefront here, the pros and cons of which have been examined extensively,[13-18] with several authors finding advantage in the expert tutor and the Harvard studies generally suggesting that tutor expertise has a negative effect on student learning, or makes no difference. The oft-quoted advice of Barrows[19] has been that both content knowledge and facilitation skills are important for the effective tutor, but forced to make a choice, he would choose the tutor with good facilitation skills. Curriculum planners at Dalhousie University[20] deliberately chose nonexperts for their first PBL groups because they felt they would not find it so difficult to refrain from lecturing. They later modified this policy because the literature on the subject is equivocal.

EVALUATING TUTORS

In most PBL programmes, students are invited to fill out course evaluation forms which include comments about their tutors. In some schools, course directors, educators, or other tutors observe and give feedback, which is as essential for tutors as for students. Training for those who give feedback is an

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Basic elements for faculty development

- educational goals of the institution defined
- resources available
- faculty time commitment
- choosing tutors
- evaluating tutors

Box 3

Student evaluation of tutor
• encourages student direction of tutorials • questions and probes tutor's reasoning process • promotes synthesis of multiple disciplinary perspectives • encourages critical appraisal of information • facilitates and supports good interpersonal relationships in the group • provides frequent feedback to students • helps students to balance basic science and clinical application in problem discussion

Box 4

Harvard Medical School tutor training programme
• one two-hour session for new tutors • a course orientation meeting for all tutors • weekly tutor meetings for all tutors • observation and feedback by an educator

Box 5

essential part of a well-designed faculty development programme.[4] All feedback is channelled to the course director who shares it with the tutors. One example of a tutor evaluation form lists seven items to be rated by the students on a scale of 1 to 5 (see box 4).

In the case of a tutor who receives negative evaluations, course directors have several choices. One option is to not ask the person to tutor again, and sometimes the unsuccessful tutor has no desire to continue. On the other hand, if the faculty member truly desires to improve tutoring skills, offering a second round of training sessions and individual observation and feedback may be very effective and may keep a much-needed tutor in the teaching force.

Faculty development at Harvard Medical School: one way for a new pathway

Harvard Medical School started a PBL programme with a small group of entering students in 1985. Known as the New Pathway, this programme was expanded to the entire entering class in the autumn of 1987 (except for the Health Sciences Technology students who are in a special MD programme sponsored jointly with Massachusetts Institute of Technology). By most standards, the Harvard faculty development programme is conservative in terms of financial resources and time commitment of the faculty. Headed by Janet Hafler, it has concentrated on the training of tutors for the PBL groups which are at the heart of the Year I and II curriculum. Additional sessions have been aimed at improving lecturing, problem-based laboratory instruction, bedside teaching, and improving the teaching skills of residents. The tutor training programme consists of four parts, each addressing a particular need (see box 5).

In the two-hour session for new tutors, the principles of PBL are briefly presented via overhead and handout by the educator or course director. This is followed by practice tutorials for groups of five to eight new tutors led by experienced tutors. To minimize distraction by the medical-technical content, the case used is usually not from the course or block in which these tutors will be teaching. The use of a case from another discipline also gives the prospective tutors a more immediate sense of what it is like to deal with unfamiliar material as a student. After 45-60 minutes, the group reconvenes for questions and discussion.

A course orientation meeting is held for all tutors approximately one week before the course begins. At this meeting the course director has an opportunity to describe his or her hopes and plans for the coming course, and any changes that have been made from previous offerings. Course guides, student and room assignments, cases, and other course materials are distributed. An important feature of this meeting is the preview of the case for the first week by the case author or course director. This is the opportunity for questions to be answered so that tutors feel comfortable with the content of the case in preparation for the first tutorial.

In the weekly tutor meetings, which are attended by all tutors, perhaps the most important faculty development activities take place. These meetings are usually held before or after the tutorial sessions to minimize travel time. The purpose of the meetings is two-fold: to hear any questions or problems tutors may have, either technical-medical matters or interpersonal problems in the tutorial group, and to preview the case for the coming week. The course director and educator are present at these meetings, but the best faculty development occurs tutor-to-tutor. Experienced tutors may offer solutions to common problems. Frequently these concern the overly quiet and non-participating student, the overly vocal and aggressive student, the seemingly unmotivated group, or the group with interpersonal conflicts. The educator is sometimes asked to come to observe a particular group and provide feedback to the tutor, or to both the tutor and the students.

The case preview is especially important if the case spans several organ systems and if the tutors are not all experts. Ideally, this part of the meeting is conducted very much like the student tutorials, with an accelerated walk through the case, questions asked, points of disagreement resolved, and ideas exchanged. The cases used at the Harvard Medical School include references for students and tutors, the case objectives, and in most cases, well-developed tutor guides.

Observation and feedback is the final element in the 'on-the-job training' offered to tutors. All new tutors are observed by an educator who meets with the tutor afterwards for 10-30 minutes. The educator is trained to give feedback with skill and sensitivity, and aims to develop a helpful alliance with the tutors. Students and tutors frequently seek out the educator or the course director when interpersonal or group process problems arise.

Lessons from 10 years' experience
• the tutor does not remain silent
• the most important tutor skill is knowing when to interject
• students need orientation to the PBL method
• an ongoing programme of faculty development is necessary

Box 6

Lessons from 10 years' experience

During 10 years of training tutors for PBL, many lessons have been learned. Some tutors get the idea that the ideal PBL tutor remains silent no matter what. We have tried to correct this flaw in our training. No doubt in contrast to lecturing, tutoring does feel like remaining silent. According to Glick's guidelines,[3] the tutor should talk about as much as any other member of the group. In a 90-minute session with one tutor and eight students, that would mean a total of roughly 10 minutes. When given those guidelines, new tutors are sometimes aghast. The important point is not how much the tutor talks (within reason), but that the tutor makes a considered decision when to interject, and when to hold back. A good rule of thumb is *never interrupt productive discussion.*

We have learned that students need orientation to learning by the problem-based method. It is true that more and more students are coming to medical school having had prior small group experience. Even so, most medical students have spent years, and been very successful, in highly competitive, traditional lecture-memorisation-pass-the-exam curricula. They need to hear the ground rules that spell out student responsibility and collaboration within the group, and how the tutor can best enhance their learning. They also need one or more practice tutorials where time is allotted for discussing the method and how it works. In the early years there was concern that not every student can learn optimally in a problem-based curriculum. This is probably still true, but the vast majority of students, with or without prior experience, find it challenging, exciting, and enjoyable. If we were ever to consider changing back to a lecture-based format for the first two years of medical school, we would have a major student rebellion on our hands.

We have learned that an ongoing programme of faculty development is necessary, even after 10 years. Tutors often need time to reflect and refresh after a few years. Faculty move to other institutions and new faculty arrive. With pressure for increased clinical and research productivity the tutor turnover will undoubtedly increase. In a large and diverse faculty, there can be an occasional 'subversive' tutor. This is a faculty member who truly does not believe that students can learn by the problem-based method and who subtly or overtly communicates to students that he/she believes they are getting an inferior medical education. Often, a tutor with this initial attitude changes his/her mind through the tutoring experience and becomes a strong supporter of PBL. Alternatively, such tutors may choose not to continue after the first tutoring assignment, or may not be invited back because of poor student evaluations.

Whatever the format of the faculty development programme, it must ultimately meet the needs of the students and curriculum it serves. By building on the success of the growing number of schools who are training and using tutors for PBL, it should be possible for any interested faculty to develop an effective programme appropriate for their unique purpose.

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