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PROBLEM-BASED LEARNING IN MEDICINE

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A PRACTICAL GUIDE FOR STUDENTS AND TEACHERS

5 TUTORIAL GROUPS AND PARTICIPANT ROLES: PROBLEMS AND SOLUTIONS

ANATOMY OF A TUTORIAL GROUP

A problem-based learning tutorial group consists of:

(a) a group chairperson
(b) a scribe
(c) other students/learners
(d) a tutor.

The roles of individuals are described in this chapter. A good group size (discussed further in chapter 2) is eight to 10 students. If the group is much larger it is impossible for all individuals to participate adequately. If the group is much smaller then there will be too little of an important ingredient, the prior knowledge of the group.

Rotating the chairperson and scribe roles

The roles of the chairperson and scribe should be rotated through the whole tutorial group. These skills, which should be acquired by all students, take time and practice to master.

Regrouping of students

Students should stay within a single tutorial group for a block, module or semester, perhaps seven to 14 weeks, but then the tutorial groups should be split and regrouped.

ATTENDANCE OF STUDENTS AND TUTOR

Compulsory attendance at tutorials for students sits uncomfortably with the principles of adult learning. The problem is that a key ingredient of problem-based learning is the input from fellow students, and if only three students out of a group of eight attends then the three who have come are seriously disadvantaged.

A group is similarly disadvantaged by the absence of a tutor, so it is essential that the tutor attends all tutorial group meetings.

DURATION OF TUTORIAL

A tutorial group may spend one to one and a half hours on a new problem plus one to one and a half hours discussing a previous problem. Course organizers and tutors should not expect three hours of high-class interactive discussion without a short break and the availability of coffee or tea.

TUTORIAL GROUPS AND ROLES

Every member of the group contributes to the process in a different way: by talking or being silent, by making jokes or being serious, by making or not making proposals, or by discussing personal experiences. The chairperson, the scribe, the group members and the tutor all have specific roles that facilitate and assist the tutorial group to function as a whole.

Students unfamiliar with problem-based learning cannot be expected to miraculously acquire the necessary skills as soon as they join a small problem-based learning group. In the initial tutorials, the tutor may have to guide and direct the chairperson, scribe and the students carefully through each step of the tutorial process, their reasoning, their learning needs and in identifying learning resources. Thus, the tutor *models* and demonstrates the behaviours and the process required to work on the problem. As students become adept at the process, the tutor *coaches* and only interjects if the students miss a step in the process, stray from the problem or are stuck or confused. With time, students mature and the level of support from the tutor is reduced. Where problem-based learning is used in the clinical part of the curriculum, the tutor has additional roles (discussed in step 8, chapter 2).

BEHAVIOUR OF THE GROUP WILL CHANGE WITH TIME

Tutorial groups working together tend to progress through four phases. An awareness of these phases helps tutors and students to understand the group's progress and not to be distressed by the inevitable group dysfunctions that occur even in the best of groups with the best of tutors.

(a) Forming

At the outset, group members are on their best behaviour, courteous, friendly and accommodating. Each member holds back any irritations and strong personal opinions.

(b) Storming

After a variable period of time, usually a few weeks, group members are no longer strangers. As they struggle to establish their roles, the individual differences or frustrations about the group's activities surface in a variety of ways: arguments, withdrawal from the group, attempts to dominate, expressions of discomfort.

(c) Norming

Interpersonal issues are resolved and the group arrives at an understanding of how to behave.

(d) Performing

The group members work together productively on the task.

These phases underline the fact that it is inappropriate to have tutorial groups function for less than six to eight weeks. In a shorter period students may never really get comfortable with the small group learning process or with each other, and may never reap the rewards of the performing phase.

Each group is an 'organism' with quite distinct behaviour. No two groups are the same.

ROLE OF THE PROBLEM-BASED LEARNING TUTORIAL GROUP

Key steps in the process

The primary role of the problem-based learning tutorial group is to study the problem systematically, using steps such as 'the seven jump' or 'the eight step' discussion process (discussed in chapter 2). The advantage of a stepped process is to remind students to stop and think reflectively about each learning situation prior to proceeding with the discussion. The purpose of the group discussion is to help students recall what they already know about the issues presented in the problem, to expose their thoughts and beliefs, to exchange, confront and question different views, to clarify their own thinking, to organize ideas within structured networks, to connect main ideas to one another and to their prior knowledge, to hypothesize, to

make inferences and eliminate the various alternatives, to raise questions and, finally, to see the need to gather more information. The role of the group is facilitated by a cooperative (as opposed to a competitive) context, and by skills in reading, communicating and thinking.

Reading the problem

Reading the problem starts off the tutorial and is a skill in itself. When reading, students should recognize main ideas and supporting information and be able to differentiate them. A helpful way is to mark the text by underlining main ideas and circling supporting details. This also helps concentrate on what is being read and prevents the mind from wandering to other things.

Communication skills

Communication skills include listening, speaking (questioning, explaining, responding, sharing information, giving and accepting criticism), perspective-taking (exploring another person's thinking and affect, including role play), respecting the views of others and interacting sensitively and humanely.

Listening is a neglected communication skill and hearing does not necessarily imply listening. To be active listeners students should:

- pay attention to the ideas that arise from the discussion (by asking, 'Is this important? Why and how is it important?')
- respond nonverbally by nodding, smiling or frowning
- respond by asking questions or requesting explanations
- make notes.

Note-taking

Note-taking helps listening by providing a logical organization to what is being heard. It is very difficult to listen to and remember disorganized, unrelated bits of information. Although students may make individual notes for themselves, the secretary has the important role of note-taking for the group as a whole.

Speaking

Speaking, instead of just looking and listening, increases involvement in learning. All students should have the opportunity to speak, express their ideas and to

contribute to the group's activities. Group members must learn to give each other constructive comments rather than ones which embarrass or intimidate. Constructive comments help to prevent shy students from withdrawing from the group.

Thinking

Thinking will vary with the problem and might include: deliberating or reflecting on the problem; analysing and evaluating evidence and reviewing what is known; creating hypotheses; making decisions about what observations, questions or probes need to be made; appraising, questioning and judging information obtained from inquiry; seeing new relationships, synthesizing, speculating, arguing rationally; pondering about other sources of information; reflecting on what has been learned, what it all may mean and what needs to be done next; transferring skills to new contexts and problem-solving. During the stage of brain-storming, group members 'storm' a problem with ideas. One key to brain-storming is that no criticism is allowed of contributions. As any idea, no matter how wild, is accepted, brain-storming is highly creative and can lead to unexpected avenues of exploration. Brain-storming is followed by the generation of hypotheses, which must of course be exposed to careful evaluation.

ROLE OF THE CHAIRPERSON

Successfully leading a group discussion requires group management skills. These skills are related to (i) the group process, (ii) the logical structure of the discussion and (iii) the content of the discussion. Like many skills, acquiring the skills of leading a group discussion requires practice with feedback. The following are suggestions to help those new to the task.

- Investigate who the group members are. Preliminary introductions help members of a new group to get to know each other.
- Make agreements with group members about the procedure of the discussion: how the problem will be discussed, how the time allotted for the discussion will be spent, how decisions will be made. Make evaluative comments during and at the end of the discussion by asking, 'Does everyone agree with what we are doing and the way this is done?' or 'Is everyone satisfied with this procedure?'
- Introduce the problem for discussion. Ensure that the group members are interested in the problem. If they are not, it may be that they do not feel it is relevant, and this will merit its own short discussion. Keep the introduction

neutral, and refrain from expressing opinions as this can influence the opinions of others and dominate the discussion.

- If silent reading of the problem is the preference of the group, then give group members time to read the problem.
- Invite participation from all group members. This can be done verbally ('what do you think?') and nonverbally (chairperson looks at John).
- Summarize or encourage another group member to do so regularly. Ask a group member to paraphrase or restate the response given by another. Summarizing and paraphrasing not only demands constant attention from all group members, but also draws together the key points, unresolved issues and important links. When expressed in an individual's own words and interrogatively, they help group members to concentrate on what is said and whether or not it is correct. Summarizing and paraphrasing strengthens comprehension, promotes deeper understanding and stimulates thoughts and opinions for further discussion.
- When thoughts and opinions are not clearly formulated, it is important to elaborate. For example:

> ***Chairperson:*** *'John. I'm not quite sure I follow. Why is it that too small a hole in the teat can cause babies to vomit. I don't see why it should. Could you just explain that again in a little more detail?'*
>
> ***Susan:*** *'Surely you've got it wrong. It's too large a hole in the teat that causes vomiting. The milk comes so fast that the baby vomits.'*
>
> ***Chairperson:*** *'But why should drinking fast make a baby vomit? If I quickly down a few pints, I don't vomit.'*
>
> ***John:*** *'The books say that too small a hole in the teat can cause vomiting. But I must admit, now that you mention it, that I can't explain it. Maybe the books are wrong.'*
>
> ***Jenny:*** *'I didn't understand this either. I asked Sister Heath about it and she said that what happens is that, when the hole is too small, the baby cannot get much milk and keeps swallowing air. The little milk that is obtained comes back when the air is regurgitated, and the parents complain the baby is vomiting. Sister said that one clue to this is the parents reporting that the baby takes 45–60 minutes to feed; the baby is spending much of that time swallowing air.'*
>
> ***Jeremy:*** *'Why do teats come with different sized holes? What are the different sizes?'*

Elaborating helps to keep the discussion on track, to deepen understanding and to stimulate further discussion..

- Stimulate the group to discuss the problem from different angles.
- Set an example that facilitates the group process. By expressing his/her own thoughts and feelings, the group leader can dispel inhibitions that group members might have about contributing their own thoughts and feelings.
- Give process observations to make group members aware about what is happening in the group. For example, group members may be talking to the chairperson rather than with each other. Thank group members for helpful contributions. Although all irrelevant remarks are not likely to interrupt a coherent discussion, those that might throw the group off track must be recognized in a manner that is not embarrassing to the speaker.
- Reformulate the subject concretely mentioning common and any possible opposing views. Check with the group whether or not the reformulation is indeed a reflection of the discussion. After reformulating, make a proposal about how to continue the discussion.
- Bring the discussion to a conclusion. Make decisions about learning goals with the group members. Seek consensus and check that all group members agree with the learning goals.
- Help the group work within the time allotted for the tutorial.

All this may seem a bit overpowering for new students leading groups for the first time. It does all get easier with practice. Leadership is itself a learning process. For more experienced students or graduate students who are well accustomed to working in groups, there may be little or no need for a chairperson.

ROLE OF THE SCRIBE

The scribe has the important role of note-taking, usually using a flip-chart, overhead transparency or white/black board. Organized notes help the group to identify important ideas and provide a record that facilitates learning and remembering. The following steps help good note-taking.

- Listen carefully to the discussion. If uncertain, ask the group what was said and whether or not it should be written down.
- Note down ideas and concepts no matter how trivial or far-fetched they might seem, but do not attempt to write down every word that is said.

- Organize the notes by categorizing concepts. For example, in a two-day-old infant with jaundice, one would categorize this as either being conjugated or unconjugated hyperbilirubinaemia. The most important part of note-taking is to present the information as a whole with all its relationships and interconnected parts. Organizing concepts requires analyses rather than merely memorizing, and helps students to understand what they are studying. Organized notes are also easier to remember.
- Review the notes with group members to check that they are representative of the group's thoughts and concepts.
- Use abbreviations that other group members are familiar with.
- Do not forget that the scribe is still a contributing member of the group! It is difficult to do well both the task of scribe and participate actively in the discussion. If the scribe becomes involved with the discussion as much as other group members, the scribing may be poor. If the scribe does not participate and simply writes things down mechanically, he or she will lose out. The trick is for the scribe to follow the discussion by mentally leading it, which will enable the scribe to make some contributions while actively thinking about the problem.
- Leave space so that information may be added later. One way is to take notes of main ideas on the left side of the flip-chart or board, leaving the right side blank for adding supporting details, comments, questions, examples or restated thoughts.
- Highlight important concepts, for example by underlining or the use of capital letters.
- Do not misuse the position of standing near the flip-chart and of holding the pen by being authoritarian and judgemental. Do not write down your own contributions but selectively ignore contributions of others!
- Groups can be well controlled by a good scribe. For example, 'I need to know what you are saying to put it on the flip-chart' is a useful and helpful way of guiding and focusing thought.

ROLE OF THE TUTOR

Although tutoring in problem-based learning is quite different from lecturing, it does not amount to thoughtless silence! Effective tutoring involves a constellation of skills, attitudes and knowledge that reflects the needs of tutorial groups for guidance in both task accomplishment and maintenance of productive working relationships. Above all, it requires intense concentration.

1. Modelling behaviours that students will adopt

The tutor should model behaviours that keep the learning process moving and ensure that no step of the learning process is neglected.

2. Promoting student direction and facilitating group interactions

Arrange seating

Seating affects patterns of interaction [18]. Interactions between students are most likely to occur when their seating is arranged so that they face each other around a table (compare the interactions around a dinner table with those in a series of rows of seats in an auditorium). The tutor should be seated with the students, and in a way that does not set the tutor apart from the students (for example sitting behind the students, or in some focal point eg at the head of a table). Interactions are further increased by varying the seating pattern in each tutorial: talkative students may be inhibited if seated close to the tutor or chairperson, and shy students are more likely to make contributions if seated opposite the tutor or chairperson.

Create a 'safe' environment

Fear of the unknown and feeling threatened or intimidated deter students from contributing. It is therefore important to clarify expectations to create a safe environment and allay anxieties. This allows students to take risks, to ask questions that might seem trivial and to try out ideas which may be wrong without being humiliated or ridiculed. The tutor should avoid expressing opinions concerning the correctness or quality of students' contributions and should avoid displaying favouritism. The tutor must also respect students and be patient while they struggle with new ideas.

Facilitate interpersonal relationships

The tutor must be aware of the interpersonal dynamics at work in the group and have skills in managing interpersonal conflict. This is discussed later in the chapter under the heading 'Problems of Interpersonal Dynamics'.

Praise and feedback

Praise (at the end of the tutorial session) when a group of students makes a good point, a valid inference or adopt a creative approach to the problem shows that

helpful contributions are valued and encourages rich interactions. Thanking the group for its contributions and pointing out what has been achieved is healthy for group morale and group functioning.

Avoid dominating the discussion

To facilitate student interactions the tutor must avoid being the focus of any discussions. Different strategies can be used to deflect attention from the tutor. When a student addresses the tutor with a statement or question, the tutor can say, 'Who has some thoughts about this comment (or question)?' or can look at another student for a response. Non-participating students may be drawn into the discussion by questions aimed directly at them (which must be carried out with care, as it can be potentially intimidating). A tutor intervening with the intention to help can easily dominate a discussion by asking narrowly focused questions, or not giving students enough time to think and respond, or giving extended answers to students' questions. The solution to this is to ask probing questions that open up rather than close down a discussion, and to replace offering complete answers that end the discussion with making brief statements that moves thinking forward.

3. Guiding the group's learning

Let students explore ideas

Students must be allowed to develop and explore ideas during the discussion. They should not be prevented from making mistakes. The tutor should guide the students' thinking through appropriate questions until they naturally and automatically develop the habit of challenging each other with similar questions. In this way, deliberate and reflective thinking becomes a group habit through practice.

Intervene appropriately

Tutors should listen attentively, be sensitive to students' needs, judge the best moment to intervene and provide information when it is appropriate to do so. Any intervention should enhance the discussion and learning rather than exert control. Intervention may be needed to encourage students expressing different views, challenge thinking, stop digression, refocus the discussion, synthesize perspectives, highlight critical points or subtly raise additional points to be considered.

Guide covertly

The guidance should be covert so that it is not apparent to the students and they continue to feel they are in charge (in control) of the learning process.

For example, ask, 'Are there other possibilities you might not have thought of?' if students have not entertained the correct hypothesis as to the underlying mechanism for a problem. Or, 'Let's stop and review our hypotheses again.' if a new finding requires new hypotheses.

This guidance should be given both when students' opinions or statements are correct as well as incorrect, to avoid the tutor's questions turning into a signal that the students are on the wrong track. Students are exquisitely sensitive to the behaviour of the tutor and will be watching the tutor out of the corners of their eyes. The slightest signals can alter the course of the discussion. One of the most common errors of tutors is to stall discussion completely by being too heavy-handed.

Probe and challenge students' thinking

The tutor should probe and challenge students' thinking and understanding with questions [18].

Examples of probing and challenging questions

'Does that always apply?'
'Why do you want to know that?'
'How is that relevant?'
'Can you tell us what you mean?'
'Can you give us an example?'
'Is there an alternative viewpoint?'
'How do you know that is true?'
'How reliable is the evidence?'
'How accurate is your description?'
'Are you sure you're right?'
'Are you comfortable with that explanation?'
'You say it is x, which particular kind of x?'
'What is the underlying principle?'
'In what situation would this rule break down?'
'What distinguishes the two cases?'

Controversy, raised by challenging students' ideas, opinions and conclusions, can trigger the cycle of learning by arousing feelings of uncertainty, conceptual conflict, curiosity and intrinsic motivation. The tutor's questions should make students aware of what questions they should be asking themselves as they tackle the

problem. They should also help students to understand the problem from their concepts of basic science principles, or pathophysiology, or other disciplines such as humanities or social sciences. They should always be reinforcing and not undermining.

Be clear about course objectives

Tutors must be clear about the objectives of the course, the principles that students are expected to master and need to ensure that students meet important curricular objectives with their problems. They must be familiar with the curriculum and be aware of students' level of prior knowledge. Tutors also have a responsibility to ensure that students recognize any doubts they may have about the correctness or sufficiency of their knowledge and that they note this as a learning objective.

Acknowledge ignorance

It is impossible for any tutor to be familiar with the wide variety of concepts (including basic science, psychosocial and ethical) included in multidisciplinary tutorial problems. A tutor admitting ignorance and willingly participating in learning sets an example to students that there is no limit to learning.

4. Motivating students to learn

Motivation enhances learning and retention. The tutor must motivate students by arousing their interest in the problem, for example challenging their thoughts, helping them to see the relevance of the problem or helping them appreciate what they will need to learn.

5. Monitoring the progress of each student in the group

The final (or block or semester) examination is not the time to find out about a poorly performing student: by then it is far too late. Monitoring the progress of each student in the group is an important tutor role. Well before a student falls too far behind to catch up and continued learning is progressively more difficult, the tutor should identify learning difficulties, difficulties in understanding information and concepts, or problems in finding appropriate information through self-directed study, in order to provide timely and appropriate help. Thus, the tutor may have to challenge the student gently in an area in which he or she is suspected to have difficulty.

6. Monitoring attendance

In most problem-based learning courses, attendance at the tutorials is compulsory, and the tutor has a role in reporting absences.

7. Providing feedback to management/planning group

As discussed in chapter 4 on problem design, it is important that the tutor provides feedback to the management group or course planners about (a) any organizational problems, and (b) the performance of individual problems, which may need to be amended, re-written or scrapped altogether.

8. Helping students to identify learning resources

The course module handbook (discussed at the end of this chapter) should give some useful suggestions for learning resources, but the tutor will be well placed to guide students who are considering other types of learning resource. For example, in the clinical part of the curriculum, the students might tackle a problem that includes the topic of cervical screening. The students (or the tutor) might come up with the idea of going to visit a laboratory that does cervical cytology, to see how it is done. The tutor should be able to give some practical guidance, saving fruitless telephone calls and wasted trips.

With an increasing emphasis on using the community as a resource, a tutor with his or her local knowledge can be invaluable either by pointing students to think of community resources (if this has not crossed their mind) or to suggest which types of resource might be worth exploring.

Tutors can also help students to identify themselves as learning resources. For example, in a problem in which it appears that the patient has cancer of the cervix, the students (in the clinical curriculum) might not consider a practical issue such as the need for urgency in referring a patient to hospital. A good way to bring this out, and one that will also introduce students to the whole process of hospital referral, is to suggest that the students draft a general practitioner's letter of referral. Students usually pick up the issue of urgency when they discuss the appropriate wording, but if they do not the tutor can suggest they discuss how letters of referral are processed when they reach the hospital. Note that the guidance is indirect; the tutor never need direct the group by asking bluntly 'how urgent is this referral?'.

PROBLEMS IN THE WAY STUDENTS TACKLE A PROBLEM-BASED LEARNING TASK

Students come to university with a range of learning strategies acquired from schoo experience as well as from other life experiences. Problems in the way that studen

tackle a problem-based learning task are related to poor learning strategies, for example strategies that permit them to avoid learning new information by classifying it as 'already known'. These strategies, and how the problems might be overcome, are described briefly in this section.

1. Failing to question the correctness of prior knowledge

Students who use this strategy recall prior knowledge and link it with new information. However, they fail to question the *correctness* of their prior knowledge, which may be incomplete or incorrect, and they therefore do not modify their prior knowledge. Students may even ignore or distort new information in the problem to make it 'fit' with their existing knowledge.

Given that much prior knowledge consists of naive beliefs and uncontrolled everyday experiences, significant changes need to be made to students' naive knowledge structures for them to understand and remember new concepts appropriately. To do this, tutors need to be able to identify errors in what students know and to help students see that their own existing concepts are in conflict with scientific data, that their notions are inadequate, incomplete or inconsistent, and that a scientific explanation provides a more convincing and powerful alternative to their own notions. This can be done through individual questioning or presenting an 'exposing' situation that invites students' comments and confrontation of each others' ideas.

2. Failing to recognize new information as 'unknown' or 'new', assuming there is nothing new to learn

This is not quite the same as the preceding problem. Students who exhibit this strategy will report knowing everything there is to know about the content of a problem, and they may do so even before they have read the problem. Instead of using the information in the problem to recall and reflect on what is known and to answer questions, students think the information is simply repetitious. The task for the tutor is to question and challenge the students' 'knowledge'.

3. Overfocusing on text vocabulary

Students who exhibit this strategy view learning as vocabulary acquisition. They isolate new words and phrases in the problem and, having done so, feel they

comprehend the problem. The words and phrases are likely to be taken out of context and are not put into the context of the students' own experiences. A series of thoughtfully designed open-ended questions from the tutor may encourage students to see that their task is not simply to decode new words but to use prior knowledge about word sequence, word meaning and the relevance of the context to understand the information in the problem.

4. Overfocusing on unrelated facts

Students who exhibit this strategy see learning as mere fact acquisition. Students simply add facts to memory as isolated bits of information unrelated to other ideas. They can recall facts but can neither link them to relevant concepts nor apply them to appropriate situations. Given that all students have some relevant knowledge to which new facts can be related, tutors can facilitate learning by having students recall the relevant knowledge, describe examples from their experiences, or use the context of the new information to form conceptual bridges between what they already know and what they are learning.

5. Overfocusing on one aspect

Students may focus on just one detail of the problem that is most appealing to them. This will be studied in depth but, probably due to lack of time, all other important aspects of the problem are neglected. Provided the problem is adequately designed, the tutor can help by questioning students about the other aspects and in a manner that reveals their importance.

6. Superficiality of discussion

There is a tendency for discussions to remain superficial, thus compromising the quality and creativity of students' conclusions and their depth of understanding. Students may use terms and concepts without having to dig to deeper levels to answer why, what, where and when. The tutor has to probe for deeper and fuller explanations and for descriptions of phenomena at a more basic level. Hypothesizing is a useful way of deepening the discussion.

7. Adopting the role of the physician

Confronted with patients' problems, students tend to adopt the role of physician. They are anxious to solve the problem of the patient, to establish the diagnosis and

subsequently focus their study activities on the treatment of that particular disease. In doing so, they are likely to avoid studying the aetiology of the disease and understanding the clinical features in terms of underlying basic mechanisms. They may also forget to look at a problem from the patient's point of view. For example, in a problem about routine ante-natal care and what happens at the 'booking clinic' (the first visit to the hospital ante-natal clinic), students usually have no idea what information should be provided. However if they are encouraged to imagine that they are the expecting-mother or her partner, and asked to think of what sort of problems they would be worried about, groups will be full of ideas.

PROBLEMS OF INTERPERSONAL DYNAMICS

Interpersonal problems may arise in any tutorial group and can inhibit its effectiveness. They do not surface until the group members have begun to get to know one another. Symptoms of disharmony or ineffectiveness [19,20] in the group include:

- lack of progress because the group cannot agree on where to go with the problem or spend a long time on cyclic or trivial discussions
- reluctance by good students to share or pool information because they feel they are 'carrying' lazy or weak students
- silence
- late arrival
- sarcasm
- lack of individual productivity
- lack of spontaneity
- arguments in place of relaxed discussions
- students taking sides on an issue
- covert, manipulative contests between students
- expressions of dissatisfaction with learning
- attempts by students to take over.

An awareness that these problems may surface at any time is a key to managing these problems. The earlier they are recognized, the more effectively and promptly they can be handled.

The tutor should not take on a parental or fully responsible role in dealing with these interpersonal problems. This will make the students dependent on the tutor, who is then

expected to solve the problem. Students must themselves learn to deal with interpersonal dynamics as they will inevitably have to do so in their professional careers.

If possible, it is helpful to let the problem go long enough for a group member to recognize it and express concern. The tutor may have to intervene early by saying, 'We aren't making progress. What do you suppose is going on?' and 'What shall we do about it?'

If the ensuing discussions cannot resolve the problem, then the group has to talk about their behaviours and feelings and design a way to manage them. The group can get together before a session, after a session or one evening for an open-ended discussion about its interpersonal problem. It should be clear to the group members that they do not have to like each other, but they do have to learn to work together effectively.

CONTINUING STAFF DEVELOPMENT FOR TUTORS

One would not expect someone to become a problem-based learning tutor without attending one or more staff development sessions for people intending to take on this role. Once initial training has been received, there is a need for more advanced training, including the facility to train on topics such as dealing with difficult individuals or groups (using role playing students or staff), and giving feedback to students. Although major problems with tutor behaviour should be picked up as the result of feedback from students to faculty, a continuing programme of staff development is part of quality management in problem-based learning.

Full details of staff development are outside the scope of this book. However, a brief outline of one possible approach to a one-day training programme 'Introduction to Problem-based Learning' for staff who wish to become problem-based learning tutors is given in Table 1. A number of variations on this programme are possible. For example, one strategy is to video a group of students working through steps 1–5, a few days before the training day, and then watch them in action performing steps 7 (and 8 if dealing with the clinical curriculum). It must be emphasized that the programme in Table 1 is more of an 'introduction to problem-based learning' than 'tutor training' and, for the latter one, would certainly want to include the topic of dealing with problem situations in tutorials — useful tools here include video clips of problem and participants taking the role of specific types of difficult behaviour, enabling the tutors in training to practise dealing with these difficulties.

TABLE 1 BRIEF OUTLINE OF A ONE-DAY STAFF DEVELOPMENT PROGRAMME FOR STAFF WHO WISH TO BECOME PROBLEM-BASED LEARNING TUTORS

9.30–9.50	All participants: Introduction to problem-based learning and the 7- or 8-step process.
9.50–10.20	Break into groups of eight to 10, one experienced problem-based learning tutor per group. Get group to apply steps 1 to 5 to a non-medical problem suitable for all participants (eg thunderclap problem — see page 31). There is unlikely to be sufficient time for the group to complete all 5 steps, but they are likely to experience the fascination and fun of the process.
10.20–10.50	All participants: Discussion of the process that has taken place, if possible with some explanation of how the 7 or 8 steps fit with what we know about how adults learn.
10.50–11.10	Coffee break
11.10–11.25	All participants: Introduction to problem design.
11.25–12.10	Break into groups. Chosing a topic that will be familiar to the remaining groups (i) select three to five learning objectives and (ii) write an interesting short paper problem designed to lead students to select similar learning objectives.
12.10–13.00	Groups exchange problems. Each group tackles a problem, using the first 5 steps of the process, the experienced tutors ensuring that each group produces a list of learning objectives.
13.00–13.45	Lunch
13.45–14.30	All participants: Comparison of, for example, group A's intended learning objectives vs learning objectives produced when group A's problem studied by group B. Discussion and analysis of problems to identify items that would need altering for future use of the problem.
14.30–15.00	All participants: Introduction to tutor role.
15.00–15.30	Break into groups. (a) role play — dealing with dysfunctional or problem individuals: members of group scripted to behave or misbehave in a particular manner while tackling a problem. One member of group takes tutor role.
15.30–15.50	Tea break
15.50–16.20	Stay in groups. (b) working with students — one member of group acts as tutor to group of problem-based learning medical students, rest of group observing.
16.20–17.00	All participants and students: Discussion of tutor role and how to cope with problems.

By introducing problem-based learning into a course, one is effectively training students to be a generation ahead of the staff. One implication of this is that, once one has started to implement problem-based learning, students who are familiar with the technique are potentially an invaluable resource in staff development.

COURSE MODULE HANDBOOK FOR STUDENTS

Students will need a handbook for each module of a problem-based learning course.

The handbook should provide:

- basic information about the module
- the text of all written problems and some information about other types of trigger material
- an opportunity for students to plan their learning. One example would be making a note of learning objectives for which there was insufficient time available
- several opportunities for reflection (for example keeping a note of issues or patients seen, with a brief note of ones thoughts, experiences and plans for the future)
- several opportunities for self-assessment (discussed in more detail in the next chapter). An illustrative example is given in Figure 1.
- an opportunity to record the experience obtained before qualification
- a list of module objectives in terms of knowledge ('By the end of the module you should understand the social influences on diet and nutrition')
- a description of the learning environment, where the students will be working, names of tutors with a timetable if there is one
- information about type of learning resources and their availability
- details of plans for skills development and a list of skills objectives (for example 'Take a full history of the gastrointestinal system', with an indication of whether or not the skill has been observed or practised and, if so, how many times)
- suggested reading list.

Here is an opportunity to assess yourself. Below is a list of objectives and a grid for you to decide how confident you CURRENTLY feel about them. You should ring an appropriate number from 1 (not at all confident) to 5 (very confident)					
Date of completion					
I understand the structure and function of the cardiovascular system	1	2	3	4	5
I understand the structure and function of the respiratory system	1	2	3	4	5
I understand the structure and function of the haematological system	1	2	3	4	5
I can describe the epidemiology of three major conditions affecting these systems	1	2	3	4	5
I could explain to a patient what hypertension is	1	2	3	4	5
I can take a full history of a problem in the respiratory system	1	2	3	4	5
I can take a full history from a patient with a blood problem	1	2	3	4	5
I can examine the cardiovascular system	1	2	3	4	5
I can examine the respiratory system	1	2	3	4	5
I could give a patient details of the diagnosis of a blood disease	1	2	3	4	5

Figure 1 Example of self-assessment in a module handbook for a first clinical year module entitled 'Heart Lungs and Blood'

COURSE MODULE NOTES FOR TUTOR

These are only for the use of tutors and course managers, and are used in conjunction with the module handbook.

The notes should contain:

- some guidance on conducting problem-based learning tutorial groups (the nature of the guidance will depend on the nature and amount of training that is given to all tutors)
- notes on the problems/trigger material, indicating the intended learning objectives and suggested learning resources. The notes may give specific comments on items in a problem. For example, in a problem about abdominal pain and diarrhoea, the first sentences of the problem might be:

  'Jenny Lever, a 19-year-old waitress, went to the hospital casualty complaining of a seven-day history of abdominal pain and diarhhoea. The restaurant where she works has told her that she must not come to work.'

  The tutor notes might point out:
  — her job implies that she handles food
  — attending casualty suggests there is a reason why she might not attend her GP
  — not being allowed to go to work: students may wish to consider public health/occupational medicine issues and rules about food handling.

If a tutor is a member of the module planning team, has helped to prepare the problems, is familiar with the learning objectives for each case, and is an expert in the topic, then tutor notes may not be crucial. However on most occasions the tutor will not be in this position, in which case these type of notes are essential.

Notes for tutors should not be given to students. Their use by students would undermine the whole process of problem-based learning.