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AMEE GUIDE

Effective small group learning: AMEE Guide No. 48

SARAH EDMUNDS[1] & GEORGE BROWN[2]

[1]University of Westminster, UK, [2]University of Nottingham, UK

Abstract

The objective of this educational guide is to outline the major facets of effective small group learning, particularly applied to medicine. These are discussion skills, methods, the roles and responsibilities of tutors and students, the dynamics of groups and the effects of individuals. It is argued that the bases of effective small group learning are discussion skills such as listening, questioning and responding. These skills are the platform for the methods of facilitating discussion and thinking. The facilitating methods strengthen the generic methods, such as tutorials, seminars and electronic tutorials. However, the success of these methods is dependent in part upon the roles and responsibilities taken by students and tutors and the consequent group dynamic. The group dynamic can be adversely affected by individuals. Evaluation of the processes of small group learning can provide diagnoses of the behaviour of difficult individuals. More importantly, studies of the processes can help to develop more effective small group learning.

Introduction

Effective small group learning in medicine is a much more challenging task than is often realised; it is relatively easier to have a meandering discussion with a group of medical students. It is much more difficult to get them to discuss constructively, to question and, most important of all, to think. Indeed many texts and articles on learning in small groups put too much emphasis on the role of the tutor and too little on the role of the students. But, as Stenhouse (1971) observed, '. . . developing small group teaching depends as much on student training as on teacher training'. To this point, we would add that an important part of the role of a tutor is to help students to develop their discussion skills and thinking beyond those attained in senior secondary school.

This theme of using discussion to facilitate thinking is the core of this Guide. It is therefore not directly concerned with small group learning in laboratories, skill centres, bedside teaching or the operating theatre, although it is hoped that these sessions will involve students in thinking. Its purpose is to help less experienced lecturers and registrars to develop the discussion and cognitive skills of their students, including interns, and their own skills in methods of learning which are primarily concerned with interpersonal interaction e.g. tutorials and seminars. The Guide is also intended to refresh the knowledge and expertise of more experienced lecturers and consultants engaged in teaching. It provides guidelines and suggestions on facilitating talking and thinking in groups; it considers the various methods of small group work and it outlines ways of evaluating the effectiveness of small group learning. Despite the importance of learning in small groups in medicine, there has been surprisingly little research on small group work other than in problem based learning (PBL).

Practice points

- Communication and cognitive skills of the tutor and the students are the basis of effective small group learning, not the methods used.
- Questioning, listening and responding are key skills for tutors and students to develop.
- Facilitating methods, such as thinking time and buzz groups, can improve generic methods of small group learning.
- Attention to the dynamic of the group is important.
- The socio-emotional well being of the group is important for success in the task of the group.
- Although there are changes in technology, developing discussion and cognitive skills remains a priority.
- The effectiveness of small group learning sessions can be improved by observing the processes of group interaction.

Hence this Guide draws on the views of experts and practitioners as well as the relevant research.

Groups and their effectiveness

Before embarking upon the main topics, it might be useful to clarify what constitutes a group and a small group, the likely benefits of small group learning and the effectiveness of small group work.

Strictly speaking, a collection of individuals is not a group until they interact. In some forms of small group learning, the interaction may be primarily with the tutor, as in some sessions in basic sciences; the interaction may be predominantly

Correspondence: S. Edmunds, Department of Psychology, University of Westminster, 309 Regent Street, London W1B 2UW, UK. Tel: 44 20 79115000; fax: +44 (0)207 911 5106; email: edmunds@westminster.ac.uk

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between the students with the tutor acting as the discussion guide, as in some sessions in ethics; the interaction may be wholly between the students, as in tutorless groups such as in some PBL sessions; or the group may be virtual, i.e. the members of the group may communicate electronically and not necessarily synchronously.

What counts as a small group depends on the cultural context. In the UK, 6–8 is often regarded as a small group for learning purposes (Jaques 2003; Exley & Dennick 2004; McCrorie 2006). As a group increases in size, the potential resources of knowledge increase but the opportunity for interaction decreases. Below a group size of four, leadership is usually shared between the members; over 12, well-defined leadership is needed; over 20, strong leadership is needed. Early work by Bales et al. (1951) suggested that a group of three or four was best for developing critical thinking and decision making. Such small groups are not possible in most medical schools: one has to work with the groups one is given. However as indicated in this Guide, one can split the large group into smaller groups and so gain many of the benefits of small group work.

These benefits include the development of discussion skills and thinking, exploration of attitudes and sharing and reflecting upon experiences. The latter are sometimes neglected in small group sessions but they are important for the development of attitudes towards tasks and patients and sometimes for the personal well-being of the students. The extent to which these benefits are gained in small groups is, of course, dependent upon the skills of the tutor and the students. Broadly speaking, small groups are better than large groups at promoting thought and developing attitudes and values, and as effective, but not as efficient, as large group teaching, at imparting information (Bligh 2000). However it would be wrong to assume that all small groups are superior to all large groups for these tasks. The size of the group may not be as important as what the group does. Studies suggest that small groups used in PBL are superior to other forms of teaching at developing critical thinking (Schmidt 1998; Davis & Harden 1999; Norman & Schmidt 2000; Wood 2003). These results may be due to the well-defined structure of the tasks in PBL. However some of the evidence in favour of PBL is questionable on methodological grounds (Colliver & Markwell 2007; Newman n.d.). Furthermore, PBL can be done badly and didactic teaching can be done well. So differences in method are not the whole story. We suggest that skills, not methods, are the key to the effectiveness of small group learning.

Skills of small group learning

The core discussion skills of small group learning are questioning, listening, responding and explaining. These skills provide the basis for the development of teamwork and collaborative learning. In the longer term they can aid the development of communication competency with patients and colleagues.

Preparation by both tutor and students, and openings and ending by the tutor are also important. Most important of all for the tutor is the meta-skill of knowing when to use a *discussion* skill. All the above discussion skills can facilitate thinking.

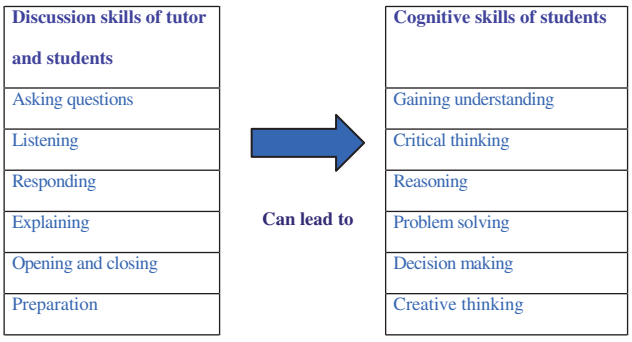

Figure 1. Discussion can lead to thinking.

In other words, *discussion* skills can develop cognitive skills. Figure 1 summarises the skills of *discussion* and thinking.

Asking questions

Questions have a number of functions in small group learning situations: to arouse interest and curiosity in a topic, to assess the extent of the students' knowledge; and to encourage critical thought and evaluation. Skilfully used questions are 'a potent device for initiating, sustaining and directing conversation' (Dickson & Hargie 2004, p. 121). Effective questioning relies on effective listening and responding but it is convenient to consider questioning separately as it is complex and a key skill within small group learning.

There are numerous types of question. Classifying these into subtypes is a useful way to start thinking about which questions to use in which situation and several different typologies have been put forward (see, e.g. Brown & Atkins 1988; Bligh 2000; Dickson & Hargie 2004; Brookfield & Preskill 2005; Watts & Pedrusa 2006). Brown and Atkins used the following dimensional classification approach which they suggested was useful for enabling effective teaching: narrow–broad; recall–thought; confused–clear; and encouraging–threatening. These dimensions are elaborated on below.

Narrow–broad

Narrow questions typically request a brief, factual response and have a correct answer. They allow the tutor to control the discussion but if used too frequently can inhibit discussion. Broad questions on the other hand tend to require a more wide ranging answer and can be answered in a number of different ways, they frequently start with the words 'why', 'what' and 'how'. Broad questions are more likely to provoke the in-depth expression of opinions, attitudes and feelings than narrow questions (Dickson & Hargie 2004). They also allow the students more control over the content of the discussion. Sometimes a tutor will pose a broad question when he actually wants a specific response and will go on to reject students' responses until the desired one is given. Bligh (2000, p. 243) describes this as a game of 'guess what I'm thinking' and advises that it can be very de-motivational for students. Instead, although it is challenging, tutors should try to accept responses to broad questions and build on these. When answers are clearly wrong, it is still good practice to focus on

them, at least briefly, and empathise with the students before re-posing the question (Bligh 2000). The terms closed and open questions are also sometimes used to refer to this dimension.

Recall-observation–thought

Bloom (1956), (see also Anderson & Kratwohl 2001) identified six cognitive levels of questioning which vary from recall of previously learnt facts through to giving opinions and making judgements about the validity and quality of ideas. Recall questions can be useful at the start of a discussion to assess knowledge and to start the thinking processes of students. It has long been known that higher level cognitive questions lead to greater achievement (Redfield & Rousseau 1981). But these types of questions are used only for about 20% of the time in classrooms (Gall 1984). They are probably used less frequently than one might expect in seminars and tutorials. This might partly be due to tutors expecting questions to arise spontaneously during discussion, but as Brown and Atkins (1988, p. 71) suggest '. . . if we want to ask questions that get students thinking then we have to think about the questions we are going to ask'.

Questions which direct observation are particularly important in medicine but little attention has been given to the use of these sorts of questions. The increasing use of mini-clinical evaluation exercise (CEX) and other methods of observation (Norcini & Burch 2007) may prompt research in this area.

Confused–clear

Clear questions tend to be brief, direct and firmly anchored in context. Confusion can result from questions that are embedded within a number of additional statements or when the context of a question is not clear. Asking two or more questions may also cause confusion.

Encouraging–threatening

The same question can be asked in a number of different ways which either encourage or inhibit student responses. You should generally try to adopt an encouraging style of questioning in order to facilitate discussion. This is not to say that the questions you ask should be easy, rather be aware of factors such as tone of voice, stance and phrasing that can make the difference between an intellectually difficult question being perceived as threatening or challenging.

Two further question types which are useful in small group settings are prompts and probes. These are supplementary follow up questions which ask a student to clarify an answer or provide more information. Typically prompts contain hints and probes contain challenges.

Prompts

These are useful as a way of giving hints, supplementary information, or in some way leading the students to give acceptable answers when the initial response to a question was not satisfactory (Bligh 2000). 'OK, it is due to the perfusion of a vital organ. So is the perfusion of the liver, the spleen, the heart, the brain . . . .?'

Box 1. Examples of probing questions.

- Which?
- Why?
- You say it is an X. What *kind* of an X?
- Does that always apply?
- How is that relevant?
- Can you give me an example?
- What alternative approach have you considered?
- How reliable is the evidence?
- Could you provide more detail on that?
- What are the underlying principles?
- So what problems did you encounter?
- What are the essential differences between the old and new procedure?

Note: Based on Brown and Atkins (1988).

Probes

These are a way of encouraging students to respond in more depth about the topic being discussed; they can often stimulate thinking. Brookfield and Preskill (2005) suggest probing questions can be used to ask for more evidence, e.g.: 'What evidence is that claim based on?', 'What does the author say that supports your argument?' They can also ask for clarification, e.g.: 'Can you give me an example?', 'Does that always apply?', 'Is there an alternative viewpoint?' Linking or extension questions can be used to encourage students to build on one another's responses, e.g. 'Is there any connection between what you have just said and what Jenny said earlier?', 'Does your comment support or challenge what we seem to be saying?', 'How does that contribution add to what has already been said?' These probes can be useful to help students see the discussion as a coherent and collaborative exercise in which each participant contributes something to a whole. A set of probing questions which have been found useful to prompt thinking in small group learning in medicine is given in Box 1.

In preparing to lead a small group learning session, it is helpful to prepare the questions you will ask. This is often an overlooked part of preparation. Plan to use a mixture of question types and think about the sequence of questions you intend to ask. However, once you have your plan, be prepared to change it as the discussion proceeds and if you feel it is appropriate, change the order of your plan or abandon prepared questions for new ones made up on the spot. Further suggestions are given in the section on preparation. You might also consider ways in which you can encourage students to ask apposite questions. A brief session on types and purposes of questioning can develop understanding (Rosenshine et al. 1996).

Listening

It is very important to listen well to what is said during small group discussions, try to hear the explicit and underlying implicit meanings of what is said. All members of the group have a responsibility to listen, but the tutor has a special

Box 2. Levels of listening.

Level	Description
Skimming	Listening very casually; used unintentionally when one is tired or distracted
Surveying	Listening to obtain the outline. Often necessary when the participant is giving too much detail
Sorting	Categorising the contents
Searching	Listening for particular content e.g. 'Did the student mention taking the BP?'
Studying	Going beyond the content to possible personal significance. Often tone of voice and facial expression indicates there may be hidden meanings

responsibility for retention of what has been said so that they can recall this at appropriate times to help the students remember and see how ideas are linked. Doing this can increase continuity in the discussion (Brookfield & Preskill 2005). Such retention is not easy, but it helps if you allow students to be at the centre of the discussion so that you can focus simply on what is being said without using cognitive resources to plan your next question. Box 2 summarises different levels of listening.

Responding

Responding to student comments in a way which encourages discussion is a difficult skill to learn. A general point to keep in mind is to be as encouraging as possible. Students are often nervous about speaking out in a group and, by being positive about responses, the tutor can develop an atmosphere where students feel safe to answer without fear of being criticised and this will facilitate the discussion (Hattie & Timperley 2007). It may seem more difficult to respond positively when an answer is incorrect but it is still possible to thank the student for their contribution. If you feel it is appropriate, then confront the student with possible flaws in the answer (but not the student!).

Often a tutor's response may take the form of a further question, but there are other effective responses too which can be used when the tutor wishes to leave control of the discussion with the students. These responses include: *reflecting back; perception checking; paraphrasing; and silence.* Reflecting or saying back to a person what he or she has just said to you is a method which is used in counselling to encourage elaboration. In small group learning, *reflecting back* allows tutors to show the students they have been listening to what has been said whilst leaving the agenda of discussion with the student (Bligh 2000). *Perception checking* involves the tutor checking his or her understanding of what the student meant by using phrases like: 'What I think you're saying is . . . . . ', 'So what you're saying is . . . .'. This can be useful to help the students clarify their thoughts more accurately. If they correct their tutor's perception then they are analysing and distinguishing their thoughts from those of their tutor (Bligh 2000). The approach can be particularly useful when discussing complex ideas; it increases understanding, and the confidence that arises from this can encourage more students to participate in the discussion. *Paraphrasing* is similar to reflecting back but the tutor uses his or her own words. This approach can help to make the discussion more precise. For example, the tutor can rephrase the comment using the appropriate technical term. 'OK. So you think it is a renal tumour which requires nephrectomy?'

Silence during a group discussion is something that makes many tutors feel uncomfortable and there is a tendency to respond to students' comments without hesitation in order to avoid such situations. However, silence can be a constructive, positive aspect of discussion (Brookfield & Preskill 2005) and it has been shown to increase student learning (Dillon 1994). It gives students time to reflect, to think through new ideas and make sense of them. Silences can be short, 5–10 s or longer; Brookfield and Preskill (2005) advocate occasional use of silences of up to a minute as a useful tactic! We would add that one should preface such a lengthy silence with 'Let's spend a minute thinking about that'.

Students can be encouraged to respond to each other by a variety of strategies from simply telling them to look at the fellow student and respond to the comments he or she made to teaching them the various modes of responding and providing practice in responding to each other. An example of the latter is to introduce a controversial topic, such as 'Should doctors assist patients who wish to commit suicide?' The students are then asked to give their views with the proviso that they must build on or use the comments of one of the previous speakers.

Explaining

A working definition of explaining is that it is 'an attempt to provide understanding of a problem to others' and understanding in this situation involves 'seeing connections which were hitherto not seen' (Brown 2006, p. 196). Explaining is a skill which can be developed with practice; the main characteristics of effective explaining are:

- Clarity and fluency – defining new terms, avoiding vagueness
- Emphasis and interest – use of intonation, pauses and paraphrasing
- Using examples – clear and appropriate ones, use the students' responses if appropriate
- Organisation – use of linking words and phrases
- Feedback – check for understanding

For small group learning, as well as knowing how to give a good explanation, it is also necessary to think about when to use explanations. If used too early in a session, explanations can induce passivity in a group. It is usually better to leave explanations until after the group have attempted the task for the session; including the explanations as part of the session summary can be effective.

Planning explanations is important and has been shown to be linked to their clarity (Brown 2006). It is more difficult to plan explanations for small group learning than for lectures as one has less control over the topics that will be discussed. However, it is useful to plan explanations of the key topics which you expect to cover during the session and any related

concepts which are particularly difficult for the group of students to understand.

Opening and closing

The opening of a small group session sets the tone for the rest of that learning session and it can influence subsequent meetings as well. Beginning with a mini lecture on the previous lecture or seminar can feel like an appropriate start but it often has the effect of inducing a passive mode on the group and it is difficult to engage the students in discussion later in the session. An alternative method is to begin by asking the students to discuss a given topic in small groups of two or three. This has the advantage of getting students to engage from the outset, it also provides a non-threatening environment for the students to begin discussing the subject, try out their ideas, and build their confidence to talk. This can be useful for encouraging the quieter members of the group to contribute to later discussions. Bligh (2000, p. 266) in his book 'What's the point in discussion?' provides a useful maxim for small group learning: 'start with simple tasks in small groups for short periods of time, and then gradually increase their respective complexity, size and duration'.

The opening of the first session with a group of students requires particular attention since this session lays the foundation of the social climate of the group and its orientation to the learning tasks. Guidance on opening the first session with a group can be summarised by the mnemonic REST which the authors use in workshops on small group teaching.

- *R* – Establish *rapport* with the group and between members of the group.
- *E* – Discuss mutual *expectations* of the roles of tutors and students.
- *S* – Outline the *structure* of the course and of the small group session.
- *T* – Set a brief, but *relevant task* and provide feedback on the groups' achievement of the task and their interaction.

An effective way to close a session is to provide a summary of the key points from the session, unresolved questions and the important links that have been made. Summaries are key for developing understanding, but they require judgement about what to highlight and what to omit. Thanking the group for their contributions and pointing out what has been achieved is good for group morale and individual self-esteem: and these approaches can enhance discussion in later meetings.

Preparation

Given that preparation is one of the keys to a successful session of small group learning, it is curious that there appears to be no research on methods of preparation. Discussions with colleagues suggest that the preparation of a session may be construed in the form of three questions:

(1) What do I want the students to learn?
(2) How do I want them to learn it?
(3) How will I find out whether they have learnt it?

Rather than starting with question 1, some tutors plan the session by thinking about question 2 or 3 first. This can be useful because the thinking processes involved in the preparation of small group work are less tidy and often more creative than a direct application of teaching by behavioural objectives. For example, if a group has not been interacting well in previous sessions you may wish to consider which method of small group learning would be most effective at improving the dynamic of the group first, and then move on to plan the learning outcomes for the session.

A mind map is a helpful way into the above questions. One writes down the topic of a session in the centre of a page and then writes down a set of sub-topics or questions around the topic. This may lead to further division of the sub-topics or to another sub-topic. The next step is to re-draw or tidy up the mind map so that similar topics are clustered together. At this stage one, can begin to identify the key questions which might structure the seminar. Note that these particular key questions are not necessarily the questions that one might ask the students. Some of them may be the questions which underlie the questions which one is going to ask.

A mind map provides the basis for thinking about any kind of topic or small group session. It may also be used during a session to move discussion on, to keep on track and to summarise. Once the mind map is completed, the next step is the choice of student task and the method of teaching. This brings one to the question, 'How am I going to get them to learn it?' To answer this question, one may have to rummage through materials, ideas in one's own head or invent new learning materials. Then comes the choice of method of small group learning – although often one moves between thinking about learning methods and the teaching methods. Last, but not least, one has to build into the tasks the opportunities to find out what the students have learnt. Examples of mind maps may be found in Buzan and Buzan (1995) and at http://www.imindmap.com and in medicine in McDermot and Clarke (1997) and at http://www.medmaps.co.uk but it is better to create your own. With more advanced students, one can set a group of them with the task of producing a mind map of a topic (Figure 2).

In general, preparing for small group learning is quicker but more challenging than preparing for lectures. A neat way to think about the difference between the two settings is that in lectures, the lecturer has to take account of what the students know whereas in small group learning the tutor also has to take into account what students know but also what they will say in a group.

Common errors in small group sessions

Common errors reported by lecturers attending workshops on small group learning in medicine are given in Box 3. Their reflections mirror many of the findings in the literature (Bligh 2000; Brookfield & Preskill 2005). A common limitation of small group discussion is that each student contributes their own point which has little relationship with those made by the

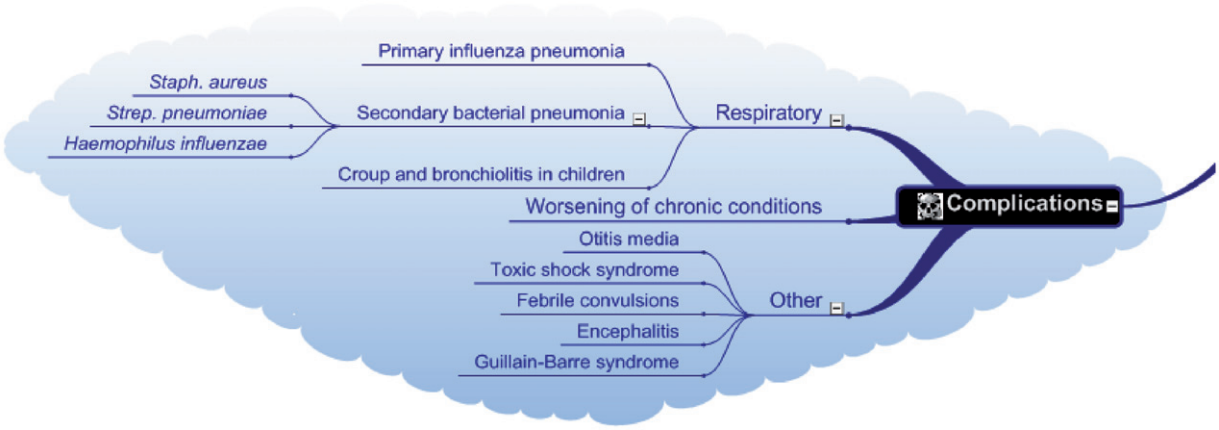

Figure 2. Extract from mind map on influenza today. Full mind map available at http://www.medmaps.co.uk

Box 3. Common errors in small group learning.

- Tutors talk too much
- Low level of participation
- Tutor-centred class when it should be student-centred
- Discussion dominated by a few students
- Low level of discussion
- Too many questions
- Questions rarely rise above the level of recall
- Discussion is unintentionally unfocused
- Insufficient variety of activities in a session
- Poor preparation by students
- Not sufficient or poor feedback to students
- Insufficient or inappropriate use of equipment
- Inability or unwillingness of tutors to respond to questions
- Little attempt to get students to answer their own questions

Box 4. Methods of learning in small groups.

Facilitating methods
Seating arrangements
Thinking time
Buzz groups
Snowball groups (pyramiding)
Cross-over groups (jigsaws)

Generic methods

Tutorials	Usually broadly controlled by tutor and based on a problem or topic. In some medical schools refers to work with one or two students
Seminars	Usually discussion of a paper or report by a student, group of students and occasionally the tutor. Journal clubs could be regarded as seminars
Workshops	Mixture of individual and group activities interspersed with plenary sessions and brief lectures. Often the best way of structuring group learning when the group is large ($N > 12$). Goals, activities and inputs by the tutor need to be planned carefully
Syndicates	Mini-project work followed reports to whole group. Forerunner of PBL
'Electronic' Tutorials	Includes video-conferencing, telephone tutorials, blogs, bulletin boards etc. May be tutor led or independent of tutor. May be synchronic or asynchronic. Take up by students may not be high

rest of the group (collective monologue) or the discussion breaks down into a series of one-to-one conversations, or a series of questions and answers between a student and a tutor.

Facilitating methods

There are some simple, effective methods of encouraging students to talk. With the exception of seating arrangements, all are based on the principles of 'making the small group smaller' and reducing the fear of talking in the presence of a tutor. All the facilitating methods may be used to improve generic and specific methods of small group learning (Boxes 4 and 5).

Seating arrangements

It has long been known from studies in social psychology (Argyle 1983; Saran 2005) and everyday observations that seating arrangements affect interaction. Steinzor (1950) long ago demonstrated in experiments and naturalistic observations that interaction was strongly influenced by direction of gaze. Using this principle, it is possible to predict patterns of interaction of different seating arrangements. However barriers, such as a large desk, can inhibit interaction and the tutor's direction of gaze can prompt students to talk. Thus, if a student is looking at the tutor whilst speaking, the tutor should switch gaze to another student and gesture or use a facial expression (Figure 3).

For larger groups a useful structure is the horseshoe which allows students to talk in small groups with or without the tutor present, allows discussion in the larger group and permits the tutor to address and monitor the whole group (Figure 4).

Thinking time

Thinking is not a brain stem response: it takes time. So if you want a group of students to think, pose the problem or ask the question then give all of them time to think and scribble their thoughts. 'Think and scribble before you talk' is good advice for many students. It is based on the research on the use of

Box 5. Specific methods of small group learning.

Lecturing	Can be over-used in small groups. Useful for briefly setting the scene, clarifying understanding and summarising what has been learnt
Step by step discussion	Planned sequence of tasks or questions. Usually under control of tutor
Free discussion	Tutor lets (even encourages!) students to talk freely. Minimal intervention by tutor but he/she may summarise discussion and move it on
Brain storming (Free association)	Brief generation of ideas. No criticism. Quantity not quality of ideas required. Evaluation comes later
Fishbowl	Group in inner circle discusses a topic. Observed by group in outer circle. Useful for skills development but clear briefing of observer and discussion tasks needed
Role play	Useful for developing communication skills. Keep role briefs for each player simple and realistic. Particularly useful in threes (e.g. 'observer', 'doctor', 'patient'). Comments by tutor on live or video-recordings of role play need to be sensitive
'Tutorless' groups	Group tackles task independently of tutor. Useful for small group and sets of small groups. Usually followed by a plenary

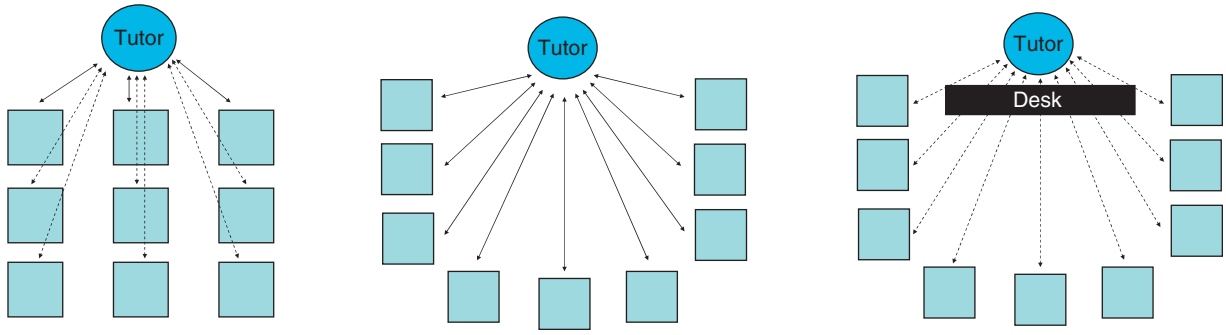

Figure 3. Seating arrangements and direction of gaze.

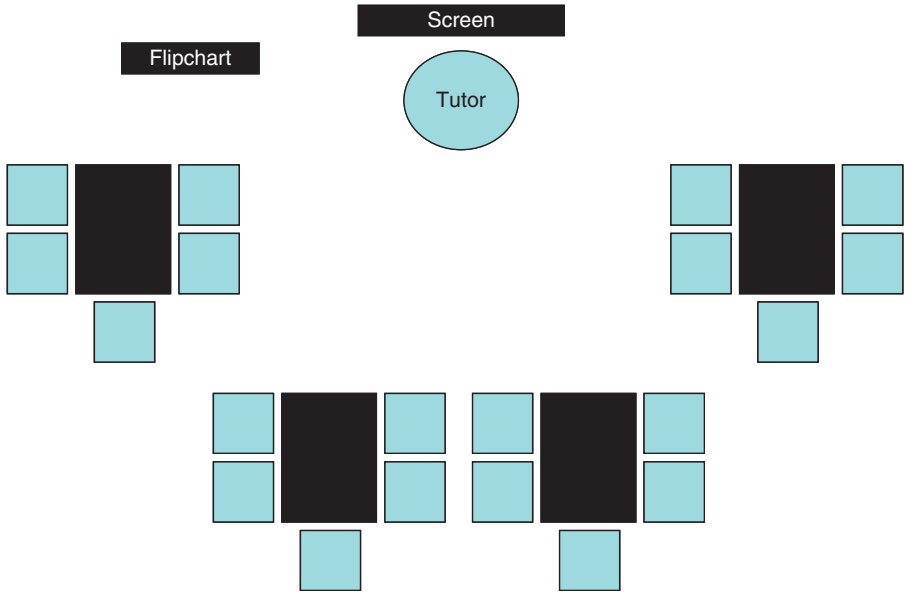

Figure 4. The horseshoe for larger groups.

wait time (Tobin 1987; Amin & Eng 2009) and silence (Brookfield & Preskill 2005).

Buzz groups

Thinking time can be followed by a buzz group(s). Essentially these are very brief discussion sessions in which small groups of students talk amongst themselves. The tutor may monitor the discussion(s), drop by and listen or prompt, but not usually participate actively in the discussion. The buzz groups are usually followed by a plenary discussion. To avoid the plenary discussions becoming boring and repetitive, one can skip the plenary; make it brief; ask each group for only one point or question and comment on it; collect the comments on a flipchart and summarise then perhaps pose a related or deeper question.

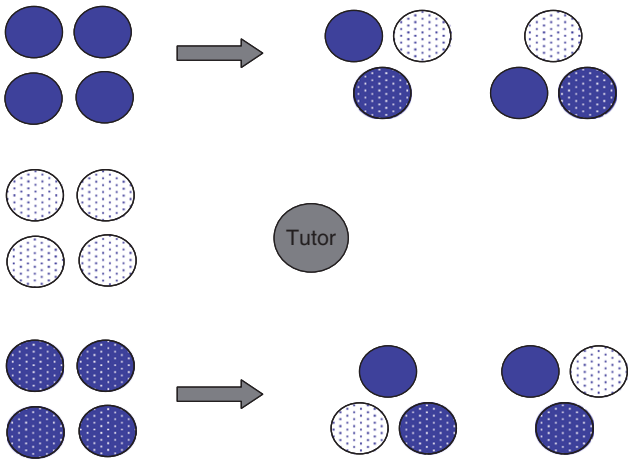

Figure 5. Cross-over groups (jigsaws).

Snowball groups (pyramiding)

The students form pairs and discuss the problem or issue, then fours and discuss. Beyond four, the procedure can become boring. So if you go beyond four, increase the complexity of the problem by adding more information or challenges.

Cross-over groups (jigsaws)

The approach is useful in large groups if the problem being discussed has multi-facets. It is particularly useful for mapping the areas of a topic. In phase one, the subgroups of students each discuss one facet. In phase two, the subgroups are re-formed so that each new subgroup contains representatives from all the phase one groups. This method is useful for establishing the areas to be covered in a topic. It can also be used as a method in longer small group sessions (Figure 5).

All of the above methods encourage students to talk – providing the tutor is friendly and encouraging. But the methods can be over-used and so lose their effect, particularly if there is no overall strategy for the small group session.

Generic methods of small group learning

There is a very large range of methods of small group learning, so it is not possible to cover all methods in this Guide.

For convenience, it is useful to distinguish: *facilitating* methods which encourage students to talk; *generic* methods, the approaches used for small group learning sessions; and *specific* methods which may be used within generic methods. It should be noted that the terms tutorials and seminars are often used interchangeably. The major methods are tutorials including PBL tutorials, seminars and workshops. Syndicates and electronic tutorials are additional methods which can be used with small groups. Boxes 4 and 5 summarise the main methods.

Box 6. Seven steps of PBL (based on Maastricht approach, see Wood (2003)).

1. State the main problem. Clarify concepts, terms etc
2. Restate the problem and the problems underlying the problem. Identify these. (e.g. basic science, clinical and epidemiological content)
3. State the tasks of the subgroups and the issues to be tackled in the problem
4. Check the component tasks and issues for each subgroup
5. Formulate the learning outcomes for each subgroup
6. Subgroups work independently on a component task/issue
7. Subgroups report and content summarised and perhaps extended by tutor

Tutorials

Very few medical schools now use tutorials in which one student or a few students read papers or solve problems. Instead the tutorial has become a post lecture or review session. The purpose of the post lecture tutorial is ostensibly to clarify understanding. In practice, it has a few handicaps. The tutor may not know the precise content and delivery of the lecture, some or all of the students may not have attended the lecture, or the timetable may have turned the post-lecture tutorial into a pre-lecture tutorial. Review sessions may be used to discuss and reflect upon visits to general practices, wards or experience on attachments. These discussions too can be desultory. The review sessions need careful planning and clear briefing of the students. To improve post lecture and review sessions, one can use the facilitating methods of thinking time, buzz groups and perhaps snowballing. The tasks might include providing reports, reflection or problem solving.

The problem solving tutorial may follow steps shown in Box 6. Modified essay questions (MEQs; Knox 1989; Coates & Khan 2002) are useful devices for structuring problem solving tutorials. They provide a sequence of questions based on a case or a problem. After discussing and answering the first question, further information, including the correct answer, is given. The participants then try to answer the next question using the correct information to the first question and so on. The procedure allows the tutor to correct any misconceptions but also gives the students the opportunity to discuss freely the sub-tasks. The approaches vary the activity and pace within the session, help students to feel secure and the approaches can develop discussion and problem solving skills.

However, it is important for students to know the goals of the session – it can be very irritating to be required to jump through hoops without knowing why.

Practical aspects of PBL are discussed in depth in Davis and Harden (1999), a brief account is provided by Wood (2003) and a useful text for students and tutors is Azer (2008).

Seminars

The original method of the seminar could be characterised as 'a paper chase' in which a student often reads a paper at two speeds, rapid for material he/she is confident about and very rapid for material he/she is unsure about

Box 7. The GAITO approach to designing workshops.

- Start with the content and free associate about possibilities for teaching and learning.
- Establish the *goals* of the session.
- Develop the *activities* for the students to do.
- Design the *inputs* that will link the activities together.
- Estimate the *time* for each activity and input. Leave some time for slippage. Amend the activities and inputs if necessary.
- Look at the *order* of activities and inputs to see if it could be improved. Sometimes the last activity that you think of is the first activity that the students should do.

(Brown & Atkins 1988). Gradually the seminar becomes a conversation between the tutor and presenter with occasional intrusions from the rest of the group. These students (to their relief?) are often ignored. The method may be improved by using thinking time, buzz groups and perhaps brain storming before the presentation and buzz groups immediately after the presentation and before a plenary discussion.

Nowadays, seminars are based on PowerPoint presentations by a student or group of students and perhaps require the presenters to teach the topic rather than merely present it (see GMC recommendations in Rubin & Franci-Christopher 2002). One can use the facilitating methods to improve interaction and one can set specific tasks for the other students in the group such as requiring them to ask questions, summarise key points, offer alternative views (even as a devil's advocate) or comment on the content and quality of the presentation. Some students are over-enthusiastic about the graphic capabilities of PowerPoint and lose sight of its primary purpose in small group learning: helping others to learn.

A third form of seminar is 'the springboard' in which the tutor provides a stimulus for discussion such as a controversial presentation, a DVD clip or audio-recording. For audio-visual recordings, it is usually better to direct the students to look for and listen to specific features of the recordings. To avoid the springboard becoming a nose-dive, the use of buzz groups, snowballing or brainstorming is recommended.

Workshops

The broad approach is given in Box 7. The authors use the approach known as GAITO (Goals, Activities, Inputs, Timing, Order of events; from Brown & Atkins 1988) in designing workshops. Workshops are often longer group learning sessions but the method can also be used in 1 h sessions. Further discussion of workshops may be found in Moon (2001).

Syndicates

In this method, a topic is split into sections and the group divided into teams. Each team works on a section of the topic and presents its views at a plenary. The tutor may act as a resource, co-ordinator and summariser. Few medical topics are linear, most are multi-factorial. Hence, the method requires careful analysis and organisation. The method is recommended by McKeachie and Svincki (2006).

Electronic tutorials

As indicated in Box 4, 'electronic tutorials' is a portmanteau term for tutorials supported by Information Technology (IT). Clearly, IT is useful in organising times and locations of classes and getting information to and from students. But its main pedagogic potential is in *enhancing* student learning and *extending* its scope (Salmon 2000; McQuiggan 2006).

Enhancing small group learning

IT in the form of virtual learning environments (VLEs), intra-net and the web can be used as a resource prior to a small group session, during a session or after a session. The resources could include, for example, anatomical sections, epidemiological findings, animation of physiological processes, demonstrations of procedures or video-sequences of diagnosis. During a small group session, one can also use computer assisted learning, computer assisted assessment and computer simulations. And, of course, one should use some parts of these sessions to discuss critically the quality, reliability and validity of online material.

Extending small group learning

Electronic systems permit small group learning at a distance and asynchronously. As indicated in Box 4, a variety of methods may be used. However, these methods are not problem free (Elwyn et al. 2001). The most obvious deficiency is the absence of nonverbal cues which are an important feature of interaction. So tutors and students need to indicate that they are listening to each other by signalling they have read each others' comments even if they do not reply with a further comment or suggestion, using phrases such as 'thank you for your comment' or 'good point'. A second problem is the reluctance of many students to use asynchronous methods such as bulletin boards. If one wants students to use these methods, then one needs to provide ground rules and incentives. The use of *Skype*™, Webinar or videoconferencing devices can enhance distance tutorials. These can have the advantage of instant messaging of diagrams or comments as well the advantages of face to face interaction.

Research on methods of small group learning

Finally, readers who are searching for an evidence base for the efficacy of the different methods of small group learning will be disappointed. For, as indicated earlier, the effectiveness of a method depends upon the skills and motivation of tutors and, to a lesser extent, the skills and motivation of students. In short, its effectiveness depends on how that method is used. Further, comparative studies of small group learning are rarely generalisable and it is extremely difficult, if not impossible, to control all the variables in experimental studies of small group learning. Meeting the stringent requirements of systematic reviews or meta-analyses would be extremely difficult. However, the majority opinion of experts and practitioners

gives testimony to the efficacy of facilitating methods and of generic and specific methods of small group learning with the usual proviso that the users of these methods are skilful.

Roles and responsibilities in small group learning

The roles and responsibilities of tutors and students are enshrined in the generally agreed broad purposes of small group learning: to discuss, to think and to reflect upon experiences. However there are likely to be differences in perceptions and emphases by tutors and students of these roles and responsibilities. Jaques (2000) states the roles of tutors are *leader, guide, facilitator, neutral chair, commentator, 'drop-in wanderer', counsellor and absent friend*. The associated responsibilities are preparing learning materials (and students?), providing a structure, keeping the discussion going, summarising what has been learnt in the discussion and developing thinking. The students' roles and responsibilities are, arguably, to think and contribute to discussions with their peers and the tutor through providing information and comments, and by asking questions. Keeping the group friendly and focussed on the task is also part of the tutor's responsibilities.

The roles and responsibilities of tutors in PBL have received attention (e.g. Maudsley 1999; Groves et al. 2005) but only one study was located which considered students' perceptions of the roles of tutors in conventional small group learning in medicine (Steinert 2004). She reported that the major views of focus groups of students were that for a group to be effective, the tutors should '. . . promote thinking and problem solving, were not threatening, encouraged interaction, did not lecture, highlighted clinical relevance, and wanted to be there'. (Steinert 2004, p. 296). Bogaard et al. (2005) in their modest survey of small group learning in political science pointed to differences in views of lecturers and students. Whilst they agreed on the broad purposes of small group learning of encouraging discussion and developing communication, the lecturers emphasised getting students to talk and think and the role of the students was to participate. The students emphasised gaining understanding and clarifying obscure points and the role of the tutor was to inform as well as to guide. The students also stressed that the purposes of small group learning should shift from tutor-centred approaches in the first year to more student-centred approaches in the final year. The study is worth replicating in medical education.

Finally, it is worth emphasising that the roles and responsibilities of the tutor and students should be discussed, agreed upon and made explicit at the outset of a course and the students reminded occasionally of their roles and responsibilities and those of their tutor.

The dynamics of groups

As indicated in the section on 'Groups and Their Effectiveness', a collection of individuals only becomes a group when they begin to interact with each other and perhaps the task of the group. Learning in small groups is essentially an interaction between a tutor, a group of students and the task. Clearly, the personal characteristics and behaviour of the tutor can have a powerful influence on the morale and performance of a group. For example, a teacher who uses humiliation as a strategy is likely to inhibit discussion and thought and engender dislike of the topic (Lempp & Seale 2004). This may be because high anxiety is evoked and this blocks retrieval and reduces cognitive capacity (Tobias 1985). A tutor who is supportive and gives guidance and feedback is likely to reduce anxiety, build confidence and self esteem, improve task performance and promote reflective learning (Bligh 2000; Hattie & Timperley 2007). It has long been known in social psychology that groups which reflect upon their learning processes are more likely to be more effective than those that focus solely on the task and groups in which members are cooperative rather than competitive are also more likely to be more effective (Bales 1970; Johnson & Johnson 1987). The ease or difficulty of a task affects interaction. Too easy or too difficult a task can cause fissures in the group. Ideally the task should be on the borders of the comfort zone of the group but clearly defined by the tutor and perceived as relevant by the students.

The phases in which groups develop were characterised by Tuckman (1965) and Tuckman & Jensen (1977) as *forming, norming, storming and performing*. Some groups (not just of students) may not arrive at performing the task and other groups regress regularly to phases two and three: re-establishing agreement on the task and roles in the group. It was suggested by Johnson and Johnson (1987) that student learning groups typically require more direction from the tutor in the forming phase, then the students proceed to the norming phase of mutual understanding and then to an additional phase of rebellion before settling down to commitment and productivity. They also point out that the stronger the group bonds, the more difficult for the group to disband.

Belbin (2004) suggests that an effective management team take on the roles and responsibilities shown in Box 8 and Figure 6 (Box 8 and Figure 6 are to be found on the website www.medicalteacher.org and in the printed AMEE Guide available from AMEE office through www.amee.org). His suggestions are apposite for teams involved in research, innovations in the medical curriculum or working on a long term group project. He suggests that it is worth inviting members of a team to complete and discuss the findings from his team role inventory. It is available free together with other useful documents on teamwork at: http://www.btinternet.com/~cert/belbin_free_downloads.htm.

Problem individuals in groups

Box 9 summarises the common interpersonal problems caused by individuals. These problems can affect the tutor and the performance of the task. The list is based upon observations and experience of working with medical and other students.

There are no foolproof methods of eliminating interpersonal problems caused by individuals in groups but the old adage 'to be fore-warned is to be fore-armed' applies. So inform the group, in the initial phase, of common

Box 9. Problem individuals in groups.

The Social Loafers (Free-riders)
Makes less effort than others in the group to complete the task and probably less effort than when they work alone.

The Silent Students
Rarely speak. Sometimes when they do, the information they give is wrong.

The Aggressive Students
Insult or argue aggressively with other students or the tutor.

The Know It All Students
Superbly confident, answers any questions, puts down anyone who disagrees, including the tutor. Occasionally they are very knowledgeable but often their confidence outstrips their knowledge.

Dumb Insolent Students
These behave in unacceptable ways such as putting their feet on desks, making offensive remarks, ignoring the tutor etc. Their actions seem designed to provoke the tutor.

Non-attendant students
These do not attend, particularly if they have been asked to give a presentation or report.

What would you do with the above students?

interpersonal problems in groups. Ask yourself four diagnostic questions:

(1) Is there a problem beneath the problem?
(2) Is the problem for the individual or the group?
(3) What is the priority – group morale or the task?
(4) What strategy or tactics can you use?

- Beforehand
- On the spot
- Privately
- Privately afterwards
- Reminders

The answers to these questions will help you to choose an appropriate approach for you. What an experienced male orthopaedic surgeon (and an ex front row forward) might do with an aggressive or 'know it all' student could be very different from what a mild mannered female paediatrician might do. A silent student may require sensitive handling if one wants him or her to talk again in a seminar. One has to resolve the dilemma of encouraging talk but correcting what has been said. If the group is mutually supportive then they can help. If it is not, then one should try to find a way of saying the answer was wrong without humiliating the student. A useful tactic one can sometimes use is to say 'I am glad you said that. Quite a lot of people thought that, but the truth is . . . ' Further hints on handling interpersonal problems in groups and teams are provided by Rothwell (2010).

Evaluating small group learning

Small group learning can be evaluated by examining its products or processes. The products may be the achievements of students, as measured by tests (e.g. MCQs, MEQs and EMIs) or student satisfaction surveys. Often these products are remote from the arena of small group learning and so, can at best, provide signals of quality. If the purpose of an evaluation is to help participants to improve their communication and cognitive skills then studies of the processes are more appropriate and important. These studies can also be useful when considering interpersonal problems in a group. The studies may be undertaken *in vivo*, retrospectively or by reviewing video recordings of the small group session. The sources of the evaluation may be the students themselves, peers (usually of the tutors) or the tutors themselves. The instruments that the evaluators use may be interaction analyses which categorise or time events in a session, checklists, rating schedules or qualitative methods such as focus groups, open ended questions or reflective discussions. Each of these approaches has advantages and disadvantages. Interaction analyses can be complex and time-consuming but they do provide profiles of the sequence of events in a session. Keep such approaches simple. Checklists are easy to use but only indicate an event occurred and run the risk of being irrelevant. Rating schedules can provide useful descriptors but training is necessary to maximise consistency. Qualitative methods and analyses often reveal deep insights that other methods cannot capture but they can be time consuming and run the risk of over-emphasising negative aspects of a session. Examples of a few approaches one can use to study processes of small group learning are provided in the full AMEE Guide, available at www.amee.org.

Summary

(1) Small group learning sessions are an interaction of tutor, students and task. Their primary purpose is to develop discussion skills and thinking.
(2) Evidence indicates that small group learning sessions are better than large groups at promoting thought and developing attitudes and values.
(3) Skills used by the tutor and students are more important than the methods used. The core skills are questioning, listening, responding and explaining. Other important skills are opening and closing sessions and preparing small group learning sessions.
(4) Facilitating methods, such as thinking time and buzz groups, can encourage students to talk and can improve the major methods of small group learning.
(5) Both tutors and students have roles and responsibilities in small group learning sessions. How they carry out those roles and responsibilities affects the dynamics of the learning group.
(6) Attention to socio-emotional well-being as well as the task of the group is more effective than a focus on the task alone. Individuals can cause interpersonal problems which affect the group or task adversely. No foolproof solution to these problems is available but one can minimise the problems by pre-empting them. Accurate diagnosis of the problem can assist in reducing its effects and provide solutions.
(7) Sessions of small group learning can be evaluated by examining products, such as achievement and student satisfaction, or by analysing and reflecting upon the processes of interaction in the group. If one wants to develop the communication and cognitive skills of members of the group, then studies of the processes are more appropriate and important than product studies.

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Notes on contributors

SARAH EDMUNDS, PhD, C Psychol, Sport and Exercise psychologist, is a research fellow at the University of Westminster, Department of Psychology. She previously worked as a senior lecturer at St Mary's University College where she completed a Post Graduate Certificate in Higher Education.

GEORGE BROWN, DPhil, Hon D. Odontology, is a retired professor of Higher Education at the University of Nottingham. As well as teaching and researching teaching and assessment, he is a national and international advisor on Higher Education. George has written over 150 articles, papers, chapters in edited texts and books on Assessment, Teaching, Learning, Course Evaluation, Health and Medical Education.

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