SECTION 4
FACILITATING LEARNING

'There can be no single way to study or best way to teach.'
Noel Entwistle. *Styles of Learning and Teaching*, 1981

OVERVIEW

Choose the most appropriate method from the rich menu of learning opportunities available and use it to maximum effect.

Chapter 20 The teacher's toolkit
There are many things to consider when choosing an educational tool from the wide range of instruments available. Think about the expected learning outcomes, the local context and the needs of the students.

Chapter 21 The lecture and teaching with large groups
Lectures can make a valuable contribution to the education programme. Careful consideration needs to be given to their role and how they are delivered.

Chapter 22 Learning in small groups
The advantages of small group teaching outweigh the problems that can arise. Conducted appropriately, small group sessions can be successful but be aware that the teacher's role should be one of facilitator.

Chapter 23 Independent learning
Students and trainees should be given more responsibility for their own learning. The learner may require support and direction.

Chapter 24 Teaching and learning in the clinical context
Lack of planning and feedback, coupled with poor supervision, often blights clinical teaching. The student, teacher and patient all have a role to play.

Chapter 25 Simulation of the clinical experience
Simulated patients, manikins, models and computer simulations complement experience with 'real' patients and have a place in a training programme.

Chapter 26 E-learning
The internet and resources available online have revolutionised medical education. They can make a significant contribution to your education programme.

Chapter 27 Peer and collaborative learning
Students learning from each other is effective. This can be informal or incorporated into scheduled activities.

The teacher's toolkit

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There are many things to consider when choosing an educational tool from the wide range of instruments available. Think about the expected learning outcomes, the local context and the needs of the students.

CHOOSING A TEACHING METHOD

The FAIR educational principles (feedback, activity, individualisation and relevance) as described in Chapter 2, if applied in practice, result in effective learning. The creation of learning opportunities for students or trainees is the subject of this chapter.

The last decade has seen a re-examination of traditional teaching methods such as the lecture with a greater emphasis on small group work and independent learning, on the use of new learning technologies including simulation and e-learning and on learning in different contexts.

It is useful to think about the choice of teaching method from different perspectives:

- The expected learning outcomes. Learning outcomes, as argued in Chapter 6, should be the starting point in any consideration of teaching.
- The tools to be used, for example simulated patients or PowerPoint presentations.
- The context or location where the learning is situated, for example the lecture theatre, the outpatient clinic or the rural community.
- The educational strategies adopted in the curriculum or course, for example problem-based learning.
- Special needs of the trainees or students, for example do they have different starting points in their abilities or mastery of the subject?

LEARNING OUTCOMES

The choice of the most appropriate learning experience for students should take into account the expected learning outcomes. A lecture may be good for providing a framework or for transmitting information, but a small group discussion is more helpful if teamwork, reflection and problem solving are to be encouraged. Teaching in the clinical context, whether with real or simulated patients, can contribute to the acquisition of clinical skills as well as demonstrating relevance and the application of theory to practice.

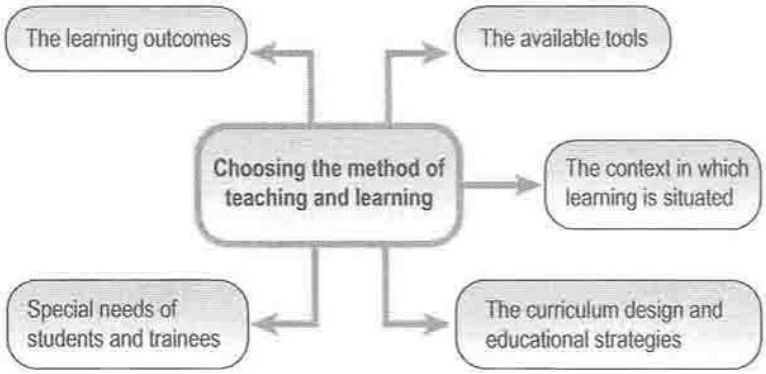

FIG 20.1 Choosing the method of teaching and learning.

Learning outcomes relating to patient safety, prevention of errors, team working, the promotion of health and the development of appropriate attitudes have been relatively neglected in the medical curriculum. The chapters that follow show how competence in these areas can be addressed if the appropriate teaching and learning method and the provision of appropriate learning opportunities are selected.

A blueprint or matrix should be prepared that matches the teaching and learning methods to the expected learning outcomes. The learning outcomes are placed on the horizontal axis and the learning methods or opportunities provided for students on the vertical axis. The vertical columns should identify at least one learning opportunity for each outcome. A learning opportunity can address several learning outcomes. Work with a simulated patient, for example, can cover both communication skills and attitude domains. A grid prepared in this way is useful not only in the planning of a training programme, but also for the students or trainees as a guide to their studies. The grid can be incorporated into a curriculum map or learning management tool if these are available.

THE TEACHER'S TOOLKIT

A competent carpenter or joiner has a toolkit with a range of tools, each of which has a key function for which it has been designed. A hammer is used to insert nails. Pliers could be used for the task but they are less efficient. The toolkit will include several types of saws, each suited to their own task. With time, the carpenter will replace old tools with new improved versions that incorporate the latest technology. If we employ a carpenter, we will expect him to have a comprehensive toolkit with the appropriate tools to tackle the job for which he has been engaged. Replace 'carpenter' with 'teacher' and the situation should be no different. The teacher should have a comprehensive up-to-date range of tools for teaching and learning. Students or trainees have the right to expect that we will incorporate in our teaching the methods most appropriate for the stated learning outcomes.

Tools available include:

- presentation tools such as PowerPoint to communicate ideas or principles particularly in a lecture context
- audience response systems (including simple coloured cards) to actively engage students in a lecture

- simulated patients and simulators to complement the use of real patients
- video clips to illustrate practical procedures
- podcasts or recordings of lectures
- games designed with an educational purpose
- online information sources and references
- computer-based learning opportunities such as virtual microscopy and interactive virtual patients
- networking tools such as Facebook to enhance collaborative learning
- peer-to-peer teaching where students support each other's learning.

An account of the tools available to the teacher is provided in the chapters that follow.

LEARNING CONTEXTS

Learning can take place in a range of contexts and situations – the classroom, the laboratory, the teaching hospital or the community. The most effective learning programmes offer a range of learning contexts with the appropriate mix or balance varying at different stages of training.

CLASSROOM CONTEXT

Classroom contexts include:

- **The lecture theatre.** Lectures have dominated many undergraduate courses. Their use and abuse are discussed later.
- **Small group work.** The value of small group teaching is now recognised along with the many advantages it offers. It is a key component of problem-based learning.
- **Practical laboratory or anatomy dissection room.** Traditional curricula provide learning opportunities in these locations. To some extent these have been replaced by alternatives including computer-based learning. (Methods used to teach anatomy are described in AMEE Guide No. 41 by Louw and co-workers (2009).)
- **Clinical skills centre.** Centres or laboratories with learning opportunities using simulators and simulated patients are a feature in many institutions. The importance of access to such facilities across all phases of education is now recognised.
- **Library, resource centre or computer suite.** The library today is very different from the library as we knew it in the past. It now includes a range of multi-media resources in addition to books. There is access to a computer, and often areas are set aside for students to learn together.

CLINICAL CONTEXT

Learning in the clinical context is at the very heart of medical education. There has been a move to more authentic learning relevant to medical practice, and the value of introducing students to patients from the first year of their studies has been demonstrated. A range of clinical contexts are available:

- **The hospital ward.** Traditionally this has provided the context for much of a student's clinical experience.

- **Ambulatory care.** With changes in hospital practice, ambulatory care and outpatient departments have provided an increasingly valuable component of a student's clinical experience.
- **Community.** Today there is increasing emphasis on community-based education in order to provide a broader perspective on patient care. The value of teaching and learning in the context of rural health care has been recognised.
- **Specialised settings.** Experience in more specialised settings such as palliative care or stroke units can provide valuable learning opportunities.

INFORMAL SETTINGS

Much of a student's education takes place away from the lecture theatre, the tutorial room or the clinic. Students may learn at home and informally from each other. Today's students are very different from those of previous generations. Networking and collaborative learning play an important part in their studies as described in Chapters 26 and 27.

EDUCATIONAL STRATEGIES

A range of educational strategies are described in Section 3. The strategy adopted has implications for the choice of learning method:

- In a *problem-based curriculum*, greater emphasis is usually (but not always) placed on small group work.
- In a *community-based curriculum*, learning takes place in a community, perhaps in a rural setting at a distance from the main education centre.
- In a *vertically integrated curriculum*, the use of simulations either in the form of simulated patients or simulators can introduce students effectively to clinical practice and practical procedures in the early years of their medical training.
- The use of a simulated ward may be valuable to support *inter-professional learning*.

Whatever educational strategy is adopted, it is likely that there will be a role for a range of teaching and learning methods. In problem-based learning, for example, while much of the emphasis will be on small group work and independent learning, the occasional lecture still has a place.

THE STUDENT OR TRAINEE

The learner should be kept sharply in focus when a learning method is selected. Think about:

- the number of students to be taught at any one time
- the background of the students and their individual needs
- the sophistication of the student in relation to new learning technologies
- the facilities available for independent learning.

Each student is different with regard to how their learning needs can best be met – one size does not fit all. As far as possible, their individual needs

should be taken into account when the learning method is selected (see also Chapters 2 and 13). Not all students will choose to attend a lecture, and many may prefer an alternative approach.

Keep in mind that students are not simply the recipients of the training or educational programme. They may be co-authors and contribute actively to its development and delivery. This is discussed further in the section on peer teaching (Chapter 27).

Depending on the approach adopted the roles expected of the teacher will vary. There is likely to be a move away from the teacher as an information provider to one of learning facilitator.

A FINAL THOUGHT

While the emphasis in this section is on the range of teaching and learning methods and opportunities, an important element that contributes to the learner's success with any method is the teacher. The success or failure of an educational session will be related as much to how well it is planned and implemented by the teacher as to the choice of the learning approach. Different methods will make different demands on the teacher. Whatever the teacher's role, it needs to be fulfilled well if the learning is to be effective.

REFLECT AND REACT

Here are some thoughts to reflect upon in relation to your choice of teaching method:

1. There is no such thing as the single 'best' teaching method. Decide the best approaches for your students and trainees, taking into account the context and resources available.
2. Most teachers adopt teaching approaches with which they have gained experience and feel comfortable. Look again at your current approaches and consider whether you are using them to maximum effect. Are you sufficiently familiar with the range of methods available, including the new technologies such as simulation and e-learning, to allow you to make an informed decision about the best methods to be adopted in your situation? The descriptions in this book will assist you but it is particularly valuable if you can gain experience of the different approaches first hand at another centre or at an educational meeting. You should aim to harness in your teaching the best of new approaches alongside the best of existing proven methods.
3. Think about the different contexts in which the student or trainee can learn. Are you exploiting fully the range of contexts? In the undergraduate curriculum, for example, with the emphasis on more authentic learning, is sufficient emphasis being given in the early years to learning in the clinical setting and in the community? In the postgraduate curriculum, are sufficient opportunities provided for the trainee to work in a clinical skills centre or online?
4. Think about how you might offer a range of learning opportunities that match the needs of the individual student.

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Ramsden, P., 2003. Learning to Teach in Higher Education, second ed. Routledge Falmer, London.
Chapter 9 in this useful book looks at teaching strategies for effective learning and develops further some of the issues raised in this chapter. It identifies problems associated with the choice of an appropriate teaching method.

IF YOU HAVE MORE TIME

Louw, G., Eizenberg, N., Carmichael, S.W., 2009. The Place of Anatomy in Medical Education. AMEE Guide No. 41. AMEE, Dundee.
A description of approaches to teaching anatomy.

McKeachie, W.J., 2010. Teaching Tips. Strategies, Research and Theory for College and University Teachers, twelfth ed. Houghton Mifflin Company, Boston.
The text, originally written to answer the questions posed by new teachers, highlights the decisions that need to be taken about the choice of teaching method.

The lecture and teaching with large groups

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Lectures can make a valuable contribution to the education programme. Careful consideration needs to be given to their role and how they are delivered.

THE USE OF LECTURES

Of all the approaches to teaching, the lecture is perhaps the method most widely adopted. It is estimated that the average medical student sits through some 1800 lectures in the course of their studies. Most will be quickly forgotten. A few may be memorable. Despite much criticism, the lecture has stood the test of time. It has a lot to offer and should not be tossed aside as being ineffective and as a result excluded from the teacher's toolkit.

Brown and Manogue (2001) describe lectures as an economical and efficient method of conveying information to large groups of students. The lecture can provide an entrée into a difficult topic, it can offer different perspectives on a subject, it can communicate relevant personal, clinical or laboratory experience, and it can deliver a research-based view where teaching is immersed in a research-intensive university.

PROBLEMS WITH LECTURES

Problems attributed to the lecture may be the result of a 'bad lecturer' or the inappropriate use of the lecture. Common criticisms of lectures (Fig. 21.1) include:

- The lecture is a passive learning experience with a failure to engage the students in their own learning.
- Much of what is covered can be learned better from reading a book or engaging in an online programme.
- The delivery is difficult to follow with the visuals overloaded with information.
- The content of the lecture is inappropriate for the audience and is irrelevant, too advanced or too simple.

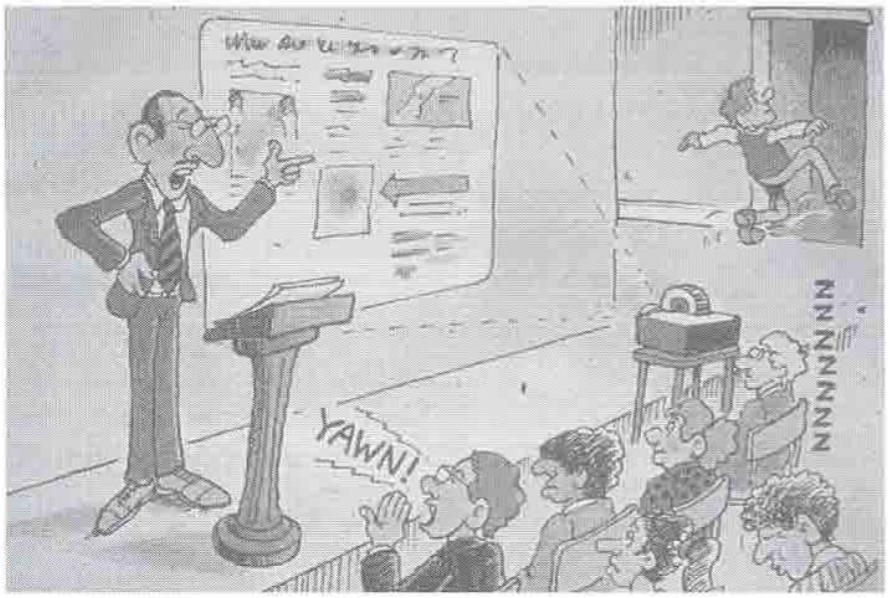

FIG 21.1 The lecture has been much criticised.

WHEN TO USE LECTURES

Lectures, if used properly, offer a number of advantages:

- The lecturer can meet simultaneously with a large group of students and convey his or her passion and enthusiasm for a subject.
- The lecture can serve as an introduction to a difficult topic and provide the students with a framework for their further studies.
- Dealing with a controversial area, the lecture can provide different perspectives and at the same time relate the topic to the local context.
- In an advancing area of knowledge, the lecture can provide up-to-date information and highlight the contributions of research in an area.
- The lecture can be used to provoke thought and discussion and to encourage the student to reflect on the topic.
- The lecture can include a practical demonstration, for example with a cardiac simulator or a patient introduced to illustrate a point (with the agreement of the patient).
- The lecture can provide the students with guidelines about their further study of the topic and can introduce the resources available.

DELIVERING A GOOD LECTURE

Lecturing can be a daunting task for some teachers who feel ill at ease when asked to perform in front of a large audience of students. Much of the stress can be alleviated with good planning and preparation.

GET SOME FACTS IN ADVANCE

Before concentrating on the content of the lecture, first do some fact finding:

- Refer to the statement of learning outcomes for the course. This should provide a clear idea of the purpose of the lecture and how it fits into the curriculum.
- Find out what the students already know about the subject of the lecture.

- Establish whether the lecture is one of a series of lectures on the subject and, if so, what the other lectures cover.
- Find out about the venue and the equipment to be used.

THINK ABOUT THE CONTENT AND STRUCTURE

Plan in advance the content and structure of the lecture:

- Plan the content for a lecture the students will wish to hear rather than the lecture you would like to give.
- Create a title for the lecture. It is sometimes easier to get started with the content if you first think of a title as it helps to structure your thoughts. It is more likely to interest students if the title is in the form of a question.
- Consider how you wish to structure the lecture. Two commonly used approaches are the classical method, where the lecture content is divided up into broad areas which are then subdivided, and the problem-centred approach where a problem or case study is presented and solutions are discussed. This chapter focuses on the classical approach although most of the tips given apply to both approaches.
- Lecturing styles vary considerably, so you must choose the style you feel most comfortable with and which suits your personality.

THE INTRODUCTION TO THE LECTURE

It is worth spending some time preparing your introduction. The first few minutes of the lecture are the most valuable. Try to instantly capture the attention of the audience and highlight why the content of the lecture is important. An engaging start to a lecture might include a press cutting of a case where an error has been made in the management of a patient, an illustration of a patient where an understanding of the pathophysiology proved valuable in the patient's management, or an interesting statistic highlighting the importance of the topic. Robert Cialdini is quoted as saying at the beginning of a lecture 'Here's a set of events unexplainable by common sense, and I promise you'll be able to solve this mystery at the end of the class'.

Don't keep the student in the dark about the content of the lecture. Tell the student what you are going to tell them, then tell them and finally tell them what you have told them. Advance organisers can help. These are signposts that help to guide the student through the content as you have structured it. For example, 'we will look in turn at six features of ...' or 'first we will look at...then at...and finally at...'.

VISUAL AIDS

Visual aids help to reinforce and emphasise important points in a lecture and to explain difficult concepts or principles. They also help to vary the pace of the lecture and to maintain the student's interest. Video clips can be used to introduce case studies. Check for typographical errors on text visuals as spelling mistakes damage your credibility. Also make sure that students at the back of the lecture theatre will be able to read the text or captions on your visuals. It is amazing how many teachers fail to do this.

PowerPoint is an application designed to help the speaker or lecturer assemble professional looking slides and is widely used in oral presentations. The result sadly is often an unending stream of slides with bullet lists, animations that obscure rather than clarify the point and cartoons that distract from rather than convey the message. A host of sites are available on the web that provide practical advice on PowerPoint presentations and can help you to avoid 'death by PowerPoint' (Harden 2008).

Visual aids are a tool to help the teacher get a message across to students in the most effective way. The lecturer, not the PowerPoint slides, should be the star of the occasion. The text on slides should complement what is being said, not replace it.

TIPS ON LECTURING

It is normal for a lecturer to feel just a little bit anxious before a lecture. Have a glass of water at the podium or nearby just in case you 'dry up'. This will be less of a problem, however, if you have done the necessary preparation and have considered the following tips highlighted in the acronym 'LECTURE' (Fig. 21.2):

FIG 21.2 Hints on delivering a lecture.

- Learn to keep distracting mannerisms to a minimum – taking spectacles off and putting them back on or jingling coins can be annoying.
- Ensure that your audience, especially those at the back of the theatre or classroom, can hear you.
- Consider carefully the use of humour. Does it add to your lecture and can you really deliver the joke or cartoon or will your attempts fall flat?
- Try to convey your enthusiasm and passion for the subject. This will be almost impossible if you read your notes. You need to vary the volume, pitch and speed of your delivery.
- Use visual aids that are effective and are legible and be sure to rehearse with the equipment and lighting before the start of the lecture.

- Remember to pace your lecture and allow time for note-taking. Speaking at the rate of an express train will not go down well with students who are struggling to keep up.
- Encourage the students to actively participate in the lecture without them feeling inhibited or threatened and leave time at the end for questions or discussion. Some strategies for engaging the audience are described below.

ENGAGING THE AUDIENCE

There are a number of strategies that can be adopted to transform your presentation from a passive to an engaging and active experience for the student. These include:

- Introduce at various stages during the lecture questions on the subject with a number of alternative answers presented. Students are asked to respond using an electronic response system, or coloured cards can be used with a different colour corresponding to each answer.
- Incorporate mini brainstorming sessions during the lecture where groups of three, four or five students next to each other are encouraged to discuss a topic. Some groups are asked to report back to the whole class. Alternatively the groups may answer and respond to a multiple choice question using cards or an audience response system. This is a key activity in team-based learning.
- Introduce or build your presentation around a case study or patient management problem, involving the class as the problem develops.

THE CLOSE OF THE LECTURE

The close at the end of the lecture is almost as important as the introduction. Summarise the main concepts or messages you wish to convey and prepare the students for any further lectures that may follow in the series. Try also to leave students with something to think about which, following the lecture, may stimulate a discussion with their colleagues.

HANDOUTS

A handout of a lecture can provide the student with the framework and also the essential messages you wish to convey. It can be designed in such a way that students are encouraged to personalise it with their own notes as the lecture proceeds. Handouts may be valuable for revision purposes. Some lecturers use printed copies of their PowerPoint presentation as handouts but this is less satisfactory than handouts designed specifically for the purpose. If you want to encourage students to take notes, make sure that you leave sufficient time for this activity.

WHAT IS THE VERDICT?

Good teachers will evaluate their lectures. It is always helpful to receive feedback from students to ascertain the clarity of the presentation, the extent to which they found it interesting, and their perception of its relevance to

the course and its value to them as an aid to their learning. An example of a questionnaire that can be used for this purpose is provided in Appendix 13. An additional insight into your lecture can be gained from inspecting the students' notes. Be warned! You might find the result a cause for concern.

A colleague may be invited to sit in the lecture and this peer assessment can provide an additional perspective on your performance. You can also assess your own performance if you have arranged for your lecture to be recorded.

REFLECT AND REACT

1. How would you rate your ability as a lecturer? What might you do to improve your performance?
2. Have you evaluated your performance from the perspective of your students or your peers?
3. What do you see as the main purpose of your lecture – to inform the students, to encourage them to reflect and think or to influence their attitudes to the subject?

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Brown, G., Manogue, M., 2001. Refreshing lecturing: a guide for lecturers. AMEE Medical Education Guide No. 22. Med. Teach. 23, 231–244 .
This Guide provides an overview of the lecture, the processes of lecturing and suggestions for improvement.

Harden, R.M., 2008. Death by PowerPoint – the need for a 'fidget index'. Med. Teach. 30, 833–835.
Some practical hints on the use of PowerPoint in presentations.

Newman, L.R., Lown, B.A., Jones, R.N., et al., 2009. Developing a peer assessment of lecturing instrument: lessons learned. Acad. Med. 84, 1104–1110.
An interesting article which describes how an instrument was created for peer assessment of lecturing using a modified Delphi method.

O'Brien, T.E., Wang, W., Medvedev, I., et al., 2006. Use of a computerized audience response system in medical student teaching: its effect on exam performance. Med. Teach. 28, 736–738.
A description of the use of an audience response system in a haematology course at Case Western Reserve University School of Medicine, USA.

Robertson, L.J., 2000. Twelve tips for using computerised interactive audience response system. Med. Teach. 22, 237–239.

IF YOU HAVE MORE TIME

Bligh, D.A., 2000. What's the use of lectures? Jossey-Bass, San Francisco.
A classic text on the use of lectures.

Learning in small groups

22

The advantages of small group teaching outweigh the problems that can arise. Conducted appropriately, small group sessions can be successful but be aware that the teacher's role should be one of facilitator.

DEFINITION

Small group teaching has been a feature of education programmes for many years, particularly in the clinical context. With the introduction of problem-based learning (PBL) and team-based learning (TBL), small group teaching attracted renewed interest. Learners work together in a group, interacting with each other to achieve common learning goals. A tutor may facilitate the work of the group or it may be self-directed.

ROLE OF SMALL GROUP TEACHING

Small group teaching should be included in the teacher's tool kit as students working in small groups can master learning outcomes not readily achievable using other learning methods.

Learning outcomes achieved through small group teaching include:

- The development of social and interpersonal skills and communication skills such as listening and debating. These skills have been recognised as important learning outcomes to be addressed in an educational programme.
- The ability of a student to work as a member of a team and to recognise the roles of other team members. Students are encouraged in small group work to behave in a professional manner and to respect the views of others in the group. Doctors need to work effectively as team members and the skills that enable them to do so should not be taken for granted.
- The ability for students to engage in problem solving, critical thinking, the analysis of a complex issue and refining their understanding.
- The fostering of skills required by students to cope with uncertainty. This reflects medical practice where issues are frequently complex and uncertainty not uncommon.
- Innovative thinking, creativity and the development of new ideas.
- Deep learning with a more complete understanding of the subject rather than superficial learning where there is an emphasis on memorisation.

- Students reflecting on their own abilities and attitudes and exploring further the concept of professionalism in medical practice. Members of the group may find preconceived beliefs challenged.
- Students' ability to take responsibility for their own learning.

ADVANTAGES

In addition to achieving key outcomes as outlined above, small group work offers a number of possible advantages:

- Small group learning embraces the FAIR principles of effective learning as described in Chapter 2. In particular it encourages active rather than passive learning and provides learners with immediate feedback with regard to their understanding and attitude to a subject.
- Students find working in properly organised small groups engaging and motivating and are encouraged to continue further with the learning process. The approach does place demands on the students but they find the less formal atmosphere of group work more relaxed and conducive to learning. The experience may even be enjoyable.
- Small group work draws and builds on the expertise and talents of the members of the group. The less effective and efficient learners may learn from others in the group and improve their learning skills. Studies have shown that where a number of groups are addressing a problem, the results from the 'poorest' group are invariably better than the results from the best individual student working alone.

PROBLEMS WITH SMALL GROUP TEACHING

This approach to teaching can be problematic. Teachers may not use the method effectively and some group sessions are mismanaged:

- Teachers accustomed to lecturing may be less experienced in the role of facilitator in the small group setting. As a result, small group work deteriorates into mini lectures.
- Small group teaching is considerably more difficult to manage than a lecture as more attention needs to be paid to individual students' behaviour, personalities and difficulties. Diversity in a group promotes varied and interesting opinions, but it also has the potential to create conflict and may interfere with the proper functioning of the group.
- Scheduling the necessary number of rooms for small group teaching may present a logistical problem. If a class of 180 students has small group activities scheduled at the same time with nine students in a group, 20 small group rooms need to be made available. This is not a problem in team-based learning as the small group activities take place in a lecture theatre or large demonstration room.
- Excessive demands may be placed on teachers' time requiring a higher than normal teacher–student ratio. This can be less of a problem if there is a greater emphasis placed on student-directed groups, or if one teacher, as in the team-based learning approach, manages a number of small groups.

- Students too often are not briefed before a small group session as to the benefits to be gained and the expected learning outcomes. This can result in them being less favourably disposed to the teaching method. They may not value what they learn in the small group work and may consider it to be a less effective use of their time when compared to attending a lecture or reading a textbook.

TECHNIQUES USED IN SMALL GROUP WORK

A number of approaches can be used to organise a small group session. Some will be more applicable than others, depending on the situation, the learners, the local context and the expected learning outcomes:

- **Brainstorming.** This is a creative thinking exercise in which group members generate as many ideas as possible without criticising or questioning their validity until time or ideas are exhausted. The ideas are then discussed. This approach is especially valuable to encourage creativity and generate new ideas.
- **Snowballing.** Learners work initially in pairs to discuss the issue or task. They then join with another pair to compare and contrast their results. The group of four learners then combines with another group of four and the exercise is repeated. The deliberations are finally discussed in a plenary session. Snowballing particularly encourages clarification of ideas and values in a non-threatening situation. A variation of snowballing is the jigsaw group. With this technique, after a topic is discussed, the groups reform into new groups, with each new group containing one member of the old group.
- **Role-playing.** Students enact a scenario assuming in turn the role of the doctor, nurse or patient. Role-playing is particularly valuable in exploring communication issues and attitudes. The sessions may be videotaped and this can be helpful to students who can view and analyse their own performance and learn from it.
- **Journal club.** This approach is frequently used in postgraduate education. Participants are asked to present and comment on recent papers in the medical literature. The group then discusses the comments.
- **Tutorial/seminar.** Tutorials are particularly helpful to enable students to critically probe subject matter in more detail. This helps them to clarify and expand on their understanding. Triggers such as clinical photographs, a videotape clip or a short student presentation may be used as a springboard for the tutorial. In a tutorial, the group can discuss material that has been covered in a lecture or in a directed self-learning exercise. The tutorial may be focused on aspects of the subject where students have encountered difficulties.
- **Problem-based learning.** Small group work plays a key role in PBL as discussed in Chapter 14. Group discussions are directed around a problem presented to the group. The students' learning needs relating to the problem are identified.
- **Clinical teaching.** Teaching is conducted with a small number of students around patients in the ward or outpatient department. Clinical skills centres also provide the setting for clinical teaching with small groups using simulated patients and models. Clinical teaching is discussed in more detail in Chapter 24.

THE ROLE OF THE TEACHER

It is obvious from these descriptions that small group activities can take many different forms. The way in which students engage in group work and the role of the teacher will vary. The approaches can be placed on a continuum from student centred to teacher centred and the role of the teacher will vary accordingly. At the 'teacher-centred' end of the spectrum, the small group session consists of a seminar or tutorial or bedside teaching with the teacher in the role of the information provider. There is likely, however, to be more student interaction than can be found in a lecture situation. At the student-centred end of the spectrum, the teacher's role is one of facilitating the group. The group may even be student led. The role of the teacher in the small group falls into one or more of the following categories:

- chair person – eliciting information and opinions from the group and managing the group process
- consultant – providing information or specialist knowledge in an area
- observer – commenting on the group discussion at appropriate places
- devil's advocate – confronting and challenging the group
- counsellor – releasing tensions in the group where members feel threatened or where some students dominate the discussions.

Facilitating a small group is one of the most skilled tasks the teacher can undertake. The teacher has to guide the work of the group and encourage the learners to interact. At the same time he or she must guard against dominating the group.

There has been much discussion, particularly in the context of PBL, as to whether the group facilitator should be a content expert or a person who has the facilitating skills without necessarily having content expertise. In most situations content expertise is seen as an important prerequisite for the teacher. This is particularly so in bedside teaching where one role of the teacher is that of information provider. Content expertise on its own, however, is insufficient and it is important that a teacher has an understanding of the small group process and the necessary facilitation skills.

Some teachers are better than others at running small group sessions and some medical schools or postgraduate institutions prefer only to use as group facilitators teachers who excel in this area. There should be a staff development programme in place to help teachers learn the skills involved.

IMPLEMENTING SMALL GROUP WORK

A number of tasks have to be carried out at each stage of a small group session.

BEFORE A SMALL GROUP ACTIVITY

A small group activity may appear relatively informal but to be effective it has to be well planned. The teacher needs to:

- Decide which approach to small group work will be adopted and the types of small group activities to be included. For example, will there be an element of brainstorming or snowballing?
- Determine the number of students in the group and the composition. Group size can vary but a generally accepted optimum number of

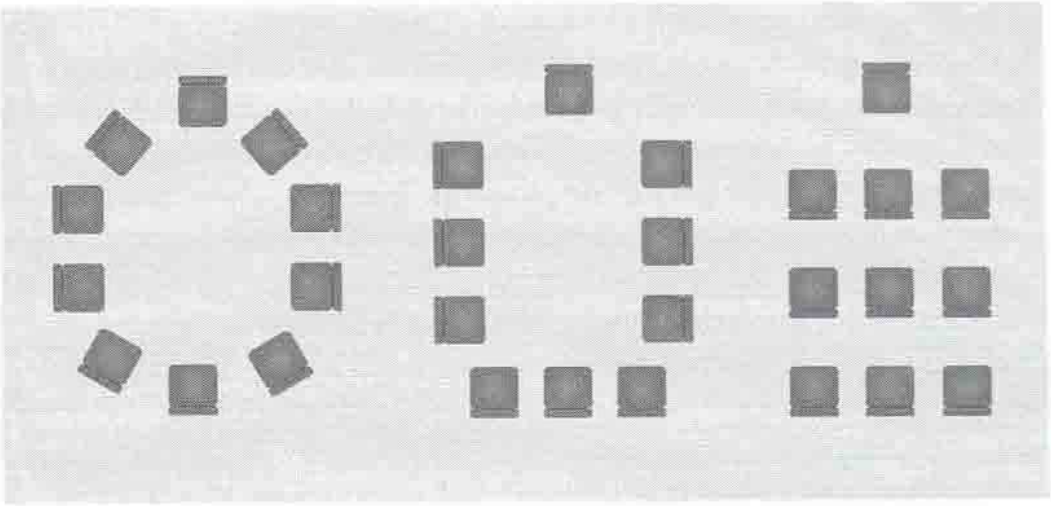

FIG 22.1 Scenarios of a seating plan for small group teaching.

students is seven or eight. In some situations this has to be expanded but should probably never exceed 12.

- Arrange the venue for the group meeting and the seating arrangements in a way that will encourage discussion. Figure 22.1 shows three scenarios. The first is the preferred option and maximises the interaction of the group. The second emphasises the role of the teacher or group leader. The third replicates a lecture theatre setting and should be avoided.
- Create the right learning environment. For example, noise from adjacent rooms can be a distracter.
- Consider and specify the expected learning outcomes of the session. These will reflect both the subject matter or theme for the group session and also more generic competencies such as reflection and interpersonal skills.
- Plan the necessary resources, e.g. trigger material in the form of a short video clip, case study or published paper. In the clinical context there are real or simulated patients.
- Brief the students in advance if you expect them to do some preparatory work or gain practical experience in the area prior to the small group session.

DURING A SMALL GROUP ACTIVITY

There is no one best way of managing a small group and dealing with any problems as they arise. The following guidelines may be helpful:

- The group members should introduce themselves to each other and state their personal goals and expectations. This sets the scene for the work to be done.
- Review the expected learning outcomes and how these will be achieved. Students may enter the small group activity with some reluctance, feeling the time spent is wasteful and that they will learn better in some other way. One of the common reasons for groups failing is the lack of clear goals and outcomes.

- Establish the ground rules for working as a group, recognising that some people may feel threatened in the group situation. Rules should ensure that contributions are received positively. A typical rule might be that only one member talks at any one time and that all members contribute.
- Create a positive atmosphere for the students' learning. There has to be an atmosphere of mutual trust and respect and they should feel comfortable enough to expose their areas of weakness.
- Focus the group on the task in hand. How this is done will depend on the agreed learning outcomes and group methods adopted. Keep the learning process moving.
- Encourage participation from members of the group by using open-ended questions, listening to what is being said and responding. Monitor the progress of each student in the group.
- Avoid being the centre or focus of the small group activity and do not provide information that other members of the group can provide or that they can get elsewhere.
- Keep the discussion at the appropriate level. It should not be boring or over-challenging.
- Recognise the different roles group members play, for example information provider or influencer, and use this information to help the group accomplish the task.
- Tackle problems in the group, such as a dominant, garrulous or lazy learner, by calling 'time out' and asking the group how they want to solve the issue.
- Towards the end of the session summarise what has been achieved and plan what is expected of the group before they next meet.

AFTER THE SMALL GROUP ACTIVITY

After a small group session be sure to:

- Support any follow-up actions identified at the group meeting. This may include access to further learning opportunities or communication online between group members.
- Plan any further small group sessions if required.
- Complete any student attendance sheets or student evaluation required.
- Evaluate the small group session, for example through student feedback forms. Reflect on the experience gained by the students and yourself, and consider how the small group session might be improved if it has to be repeated.

REFLECT AND REACT

1. Are you making sufficient use of small group methods in your teaching programme?
2. If you are using or considering using small group teaching, look again at the learning outcomes you expect your learners to achieve. How do these compare with the suggested outcomes for small group work described above?

3. Which small group methods would be appropriate in your own context and what is your role in the group?
4. Would attending a staff development programme on small group teaching be helpful to you?

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Edmunds, S., Brown, G., 2010. Effective Small Group Learning. AMEE Guide No. 48. AMEE, Dundee.
An overview of the use of small group methods in medicine and what makes them effective.

Crosby, J.R., Hesketh, E.A., 2004. Developing the teaching instinct: 11: Small group learning. Med. Teach. 26, 16–19.
A brief guide to the use of small group learning in medicine.

McCrorie, P., 2010. Teaching and leading small groups. In: Swanwick, T. (Ed.), Understanding Medical Education: Evidence, Theory and Practice. Wiley-Blackwell, Chichester.
A useful introduction to the use of small group work in medical education.

Steinert, Y., 1996. Twelve tips for effective small-group teaching in the health professions. Med. Teach. 18, 203–207.
Practical suggestions for successfully implementing small group learning.

IF YOU HAVE MORE TIME

Miflin, B., 2004. Small groups and problem-based learning: are we singing from the same hymn sheet? Med. Teach. 26, 444–450.
Small group learning considered in the context of PBL.

Independent learning

23

Students and trainees should be given more responsibility for their own learning. The learner may require support and direction.

In Chapters 21 and 22 we looked at how students learn in the lecture and small group settings. Independent learning by students outside these contexts has always been a feature of education. The importance of independent learning, where students take charge of their learning and tailor it to their own particular needs, has become increasingly recognised.

THE IMPORTANCE OF INDEPENDENT LEARNING

There are a variety of reasons for the increased interest in independent learning:

- There has been a move from teacher-centred learning, where the emphasis is on what the teacher teaches, to student-centred learning with the emphasis on what the student learns.
- The excessive use of lectures as a learning experience has been criticised and more time is available in the curriculum for other learning activities.
- Curricula now include electives or options where, for part of the course, students plan their own studies as described in Chapter 17.
- Collaborative learning and peer-to-peer learning is increasingly becoming part of mainstream education as discussed in Chapter 27.

THE BENEFITS OF INDEPENDENT LEARNING

Independent learning offers a number of advantages:

- With a more diverse student population now admitted to medical school, the learning can be matched to the needs of the individual student.
- The move to an outcome-based model (see Section 2) has made it easier for students to understand what is expected of them and makes it possible for them to create their own personal learning programme. When asked about the necessity of attending lectures students indicate that the main reason is to learn what they should be studying. In outcome-based education the learning outcomes are transparent.
- There is an increasing focus on distance learning and hybrid models that incorporate face-to-face and distance learning. Independent learning by the student is a key feature.

- Students now learn in a variety of sites such as the community, the district hospital and clinical skills centres. This often results in the students having to take more responsibility for their own learning.
- The need for life-long learning and continuing professional development is recognised. This requires students to learn to take more responsibility for their own learning early in their training and to acquire and refine the necessary learning skills.
- Advances in technology and internet developments have resulted in rich and powerful learning experiences becoming available.
- If independent learning is used to replace some lectures, the teacher is free to engage in more rewarding activities interacting with small groups or individual students.

BENEFITS FOR THE STUDENT

When compared to the more formal lecture or small group setting, independent learning offers the student a number of advantages. Students can:

- Choose to work at their own pace spending whatever time is necessary to achieve the required mastery of the subject.
- Decide when and where they study. This may be in the work place, on the job or at home.
- Tailor the content of the learning to their personal learning needs.
- Select the method of learning and an instructional design to match how they best learn. Some students are visual learners while others prefer the audio channel.
- Engage to a greater extent in deep learning and reflect on the subject as they pursue their studies.
- Monitor their own progress, using appropriate learning resources, and adjust their continuing learning based on feedback received.

ROLE OF INDEPENDENT LEARNING IN THE CURRICULUM

Two questions have to be asked about the role of independent learning in the curriculum. First, how much time should be scheduled in the curriculum for independent learning or private study? Some curricula have formal activities timetabled from 9.00am until 5.00pm leaving the student free for independent study only at other times. This is built on the premise that if time is left for private study students will not make full use of the opportunity and teachers will not be employed in the work for which they have been engaged. A second question relates to the extent to which the students' independent learning should be managed or the control left with the students. There are strong arguments for replacing the term 'self-directed learning' with the term 'directed self learning' as all students benefit from some direction or management of their learning. The need for this will vary from student to student, and with the same student in the different phases of undergraduate and postgraduate education. It has been suggested that the level of autonomy given to a student is one of the most important decisions a teacher has to make. Too little direction will result in confusion and inefficient and ineffective learning. Excessive direction will be demotivating and even result in boredom. This is described in Chapter 13.

THE ROLE OF THE TEACHER

The teacher's role in independent learning is very different from that to which he or she may be accustomed. There is a switch in emphasis from the teacher as the information provider to the teacher as the facilitator of the student's learning. The role of facilitator is a more demanding one and requires an appreciation of the needs of the learners and the potential problems the students may encounter when working on their own. A teacher is responsible for:

- Creating a supportive learning environment for students that encourages independent learning, self-confidence, curiosity and the desire to continue to learn. Independent learning will be fostered by a climate that is flexible and responsive to the learner's needs.
- Briefing students on the role of independent learning in the curriculum and, if students are relatively inexperienced, providing counselling and advice on the skills required.
- Working with the students to help them develop their own learning plan.
- Communicating the core learning outcomes expected of the student.
- Assisting students to identify appropriate learning resource materials and providing advice on how they can best be used. The teacher may also create new learning materials or annotate or adapt existing resources.
- Advising and assisting students to monitor their progress and assess their mastery of the subject.
- Responding to problems that may arise and being available, perhaps at a specified time and place, to advise students.

LEARNING RESOURCES

A wide range of learning resources are available to support independent learning. These include:

- Published books and journal articles. Print has the advantage that it does not require technology. It is highly portable, and the text can be easily annotated or highlighted.
- DVDs. These have the advantage of offering multi-media images including video clips of procedures or personal commentaries from the author.
- Online resources. An increasing amount of learning material is available for instant access through a range of websites including YouTube, Wikipedia and Facebook. There may be a problem however with quality assurance.
- Recordings and podcasts of lectures.
- Resources delivered through smart phones and other mobile devices such as the iPad.
- Tele- and web-conferences using a tool such as Wimba. These allow live interaction with other students and with a teacher or facilitator.
- Models and simulators as discussed in Chapter 25.
- Patients, both real and simulated, as discussed in Chapter 25.

The choice of learning resources will depend on the expected learning outcomes, the resources available and the technology support.

A teacher may wish to create independent learning resources for use by his or her students. Unless these are simply recordings of their teaching sessions, which is not advised, it can be a demanding task and is best undertaken in collaboration with an educational technologist or a colleague who has experience in the technology and in instructional design. The same general educational principles apply that were described in Chapter 2. Feedback should be provided, learning should be active rather than passive, and the students encouraged to reflect on what they have learned. Students should be able to individualise the resources to meet their own personal needs and the content should be relevant and matched to the specified learning outcomes.

INDEPENDENT LEARNING AND THE CURRICULUM

Independent learning can be scheduled in the curriculum:

- As a replacement for scheduled activities such as lectures. It may be used as a substitute for lectures when a new course is planned or to replace lectures in an existing course to free students' time for other activities.
- As an alternative option to student attendance at a lecture. Podcasts are available for this purpose in many medical schools. Students have the choice of attending the lecture or covering the topic at a time and place more convenient to them.
- As an adjunct to existing learning opportunities. The modern equivalent of the reading list includes URLs for online resources and other multimedia. The teacher can provide annotations and comments to assist the student to select the most appropriate resources.
- For revision or remedial purposes.

STUDY GUIDES

The concept of study guides to support a student's learning was introduced in Chapter 13. They can play an important part in independent learning. The student is guided through the range of learning opportunities and given advice on how they can make the best use of the available time. The guide can include activities relating to the topic.

Guides can be provided in printed or electronic format. An extract from a study guide for junior doctors is shown in Appendix 4. Icons and the page layout are used to facilitate learning. The design of a study guide varies depending on how it is intended the student will make use of it. The position of a study guide on the study guide triangle (Fig. 23.1) indicates the extent to which the guide has been designed to:

- help students to manage their learning
- suggest activities to facilitate the learning
- provide content to support the student's learning.

A guide can be positioned anywhere on the study guide triangle, depending on its intended use.

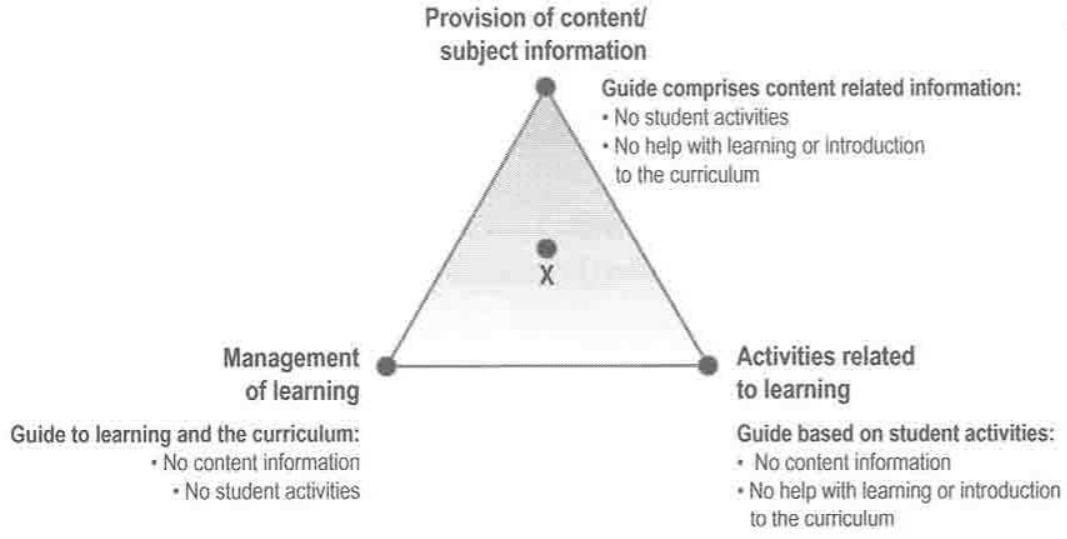

FIG 23.1 The study guide triangle with the three extremes identified and a guide with an equal emphasis on content provision, management of learning and activities represented at X.

DISTANCE LEARNING

Some institutions have gone as far as putting complete courses or modules online. A student may be able to complete a course of study almost entirely at a distance from the course provider. It is more usual for a hybrid model to be adopted that blends independent learning and face-to-face elements.

Students working independently have a choice of when and where they study (Fig. 23.2). This may be at a central learning resource centre on campus, in a peripheral training facility at a distance from the teacher and the main campus, or at home. In synchronous learning the time is fixed and students interact live with other students or with the teacher. A typical example of this is a telephone or web-conference or an online chat room. Working asynchronously, students may choose the time at which they wish to learn and communicate with other students and the teacher. This may be done using email or bulletin boards.

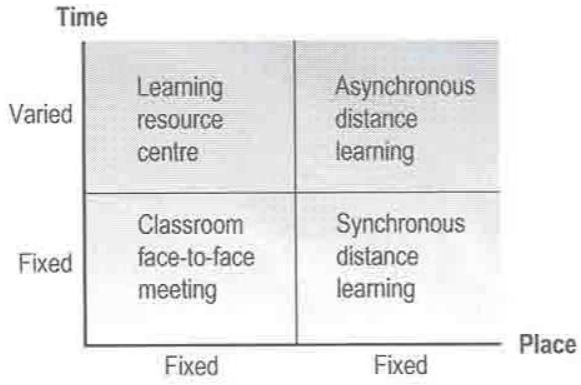

FIG 23.2 In distance learning the place and time of learning may be fixed or varied.

PROBLEMS WITH INDEPENDENT LEARNING

Independent learning has an important role to play in undergraduate, post-graduate and continuing education. Problems can arise if it is left to chance, if insufficient preparatory work is done or if there is a lack of guidance and support for the students to allow them to make the best use of the time available.

REFLECT AND REACT

The task of planning the student's or trainee's independent learning is a significant responsibility.

1. Consider whether you have the right balance in your teaching programme between face-to-face contact with your students and opportunities for students to work on their own. Is time scheduled in the curriculum for independent learning?
2. Do you do enough to help the students maximise the benefits of learning on their own through the provision of advice and/or study guides to support the students' learning?
3. Are the benefits to be gained from the use of the new technologies sufficiently exploited in your programme?
4. Consider the level of autonomy that you offer the student and the control that you exert over their learning. How does this change as the student progresses through the course?
5. Consider whether you might work on the creation of learning resource material and if so with whom you might collaborate.

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Harden, R.M., Laidlaw, J.M., Hesketh, E.A., 1999. Study guides: their use and preparation. AMEE Guide No. 16. Med. Teach. 21, 248–265.

Montemayor, L.L.E., 2002. Twelve tips for the development of electronic study guides. Med. Teach. 24, 473–478.

IF YOU HAVE MORE TIME

Dron, J., 2007. Control and Constraint in e-Learning: Choosing When to Choose. IDEA Group Publishing, London.
A useful discussion of how much autonomy should be given by the teacher to the student to manage their learning.

Laidlaw, J.M., Hesketh, E.A., Harden, R.M., 2009. Study guides. In: Dent, J.A., Harden, R.M. (Eds.), A Practical Guide for Medical Teachers. third ed. Elsevier, London (Chapter 27).,
This chapter outlines important trends in independent learning.

Teaching and learning in the clinical context

24

Lack of planning and feedback, coupled with poor supervision, often blights clinical teaching. The student, teacher and patient all have their role to play.

DEFINITION

Clinical teaching is teaching that focuses on real patients in clinical settings. The setting may be the hospital ward, out-patient department or surgical theatre, or the community.

CHANGING PERCEPTIONS OF CLINICAL TEACHING

Clinical teaching should be at the heart of medical education but how it is delivered is sadly often ignored. Traditionally the training of a doctor was based on the apprenticeship model where the trainee was attached to a reputable physician and worked with the physician in the day-to-day care of patients. This approach provided a relevant and practical training but had two disadvantages. There was a perceived lack of scientific underpinning of

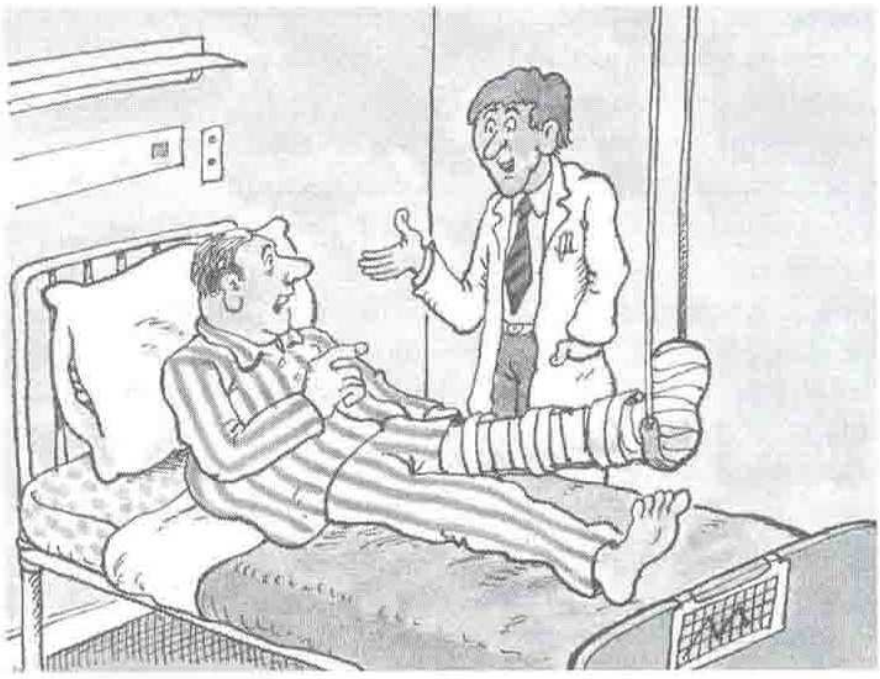

FIG 24.1 Clinical teaching.

the education and the quality of the training varied with the trainer's capacity and conscientiousness. For these reasons, as described earlier in the book, in the early part of the twentieth century training was moved to medical schools and associated with a defined curriculum. A greater emphasis was put on the scientific basis for medicine and this played a key role in the early training of a doctor and lectures were widely adopted. In the past two decades there has been a move to return an emphasis in training to the clinical context, with the provision of authentic learning experiences from the early years of the undergraduate curriculum. Changes have also taken place in postgraduate education with the recognition that the education of the trainee does not need to conflict with his or her service role in the delivery of health care. With an appropriate curriculum and planning, learning can be managed 'on the job' in the context of the trainee's work.

THE IMPORTANCE OF CLINICAL TEACHING

The advantages of clinical training are obvious:

- If it is implemented appropriately, students are motivated by the relevance of the learning. Students enter medicine to become doctors, and learning with patients and from patients is a powerful and effective learning experience.
- Learning round a patient helps to convey a holistic approach to medical care that combines the necessary knowledge, skills and attitudes.

THE STUDENT

Key players in clinical teaching are the student, the teacher and the patient. The role of the student in the clinical setting varies depending on their seniority and their stage in the curriculum. A junior student may actively engage in learning while not being a member of the team delivering the patient's care. Students may visit the ward in groups of six to ten and be taught on one or more selected patients by an assigned clinical teacher. Students observe the teacher taking a patient's history or examining the patient and may have the opportunity to do so themselves. The students are then questioned on the findings and required to reflect on the patient's case. Feedback is given to the student.

A more senior student participates in a clerkship as a member of the healthcare team. The teaching is integrated into the care of the patient. Students move from a peripheral role to one of participating as members of the medical community of practice. Students learn from working alongside experienced practitioners and other members of the healthcare team. In the process they are socialised into the practice of medicine. The ward round and patient care conferences are typical learning opportunities.

In postgraduate training, work-based learning is the norm with the trainees developing their competencies as junior members of the healthcare team with certain assigned responsibilities. Short courses relating to specialised aspects of the work or procedures can be scheduled.

THE TEACHER

The role of the clinical teacher is particularly challenging as it encompasses the range of roles highlighted in Chapter 1. These include information provider, role model, facilitator, mentor, assessor and planner. Clinical teachers assume multiple roles when they interact with their students. They need to be 'the expert' and a source of knowledge while at the same time facilitating the students' learning by having an understanding about the teaching and learning process. Both senior and junior doctors serve as role models for students. Many studies have explored the attributes of a good clinical teacher and these are summarised in Table 24.1.

Table 24.1 *Features of the good clinical teacher*

Good clinical teacher	Bad clinical teacher
Plans the clinical teaching with clearly defined learning outcomes	Haphazard approach with no clear plan
Appears enthusiastic with a positive attitude	Disinterested and regards the teaching as an intrusion into other commitments
Serves as a positive role model demonstrating good relationships with patients	Serves as a poor role model lacking aspects of professionalism in practice
Helpful and available to students	Intimidating and teaches by humiliation
Encourages student active participation	Didactic with student's role passive
Patient-orientated with problem solving	Disease-orientated and factual
Observes student examining patient and provides feedback	Listens to or reads students' reports of examination of patient and provides inadequate feedback
Provides students with opportunity to practise their skills	Does not encourage students to practise their skills
Tailors the teaching to the stage of training of the students and to the needs of the individual students	Does not take into consideration the stage of training of the students or their individual needs

The skills required of a clinical teacher too often have been taken for granted and it has been assumed that if doctors are good practitioners, they are also good teachers. Unfortunately deficiencies and poor practice in clinical teaching have been widely recognised. Problems identified include the lack of planning, inappropriate supervision, lack of feedback and failure to appreciate basic educational principles as to how students learn.

THE PATIENT

Clinical teaching is unique as the key element is the patient. The patient may be a hospital in-patient or out-patient or may be located in the community. In addition to learning with 'real patients', students can benefit from exposure to simulations including simulated patients, manikins and computer representations as described in Chapter 25. These tools can complement but not

replace experience with real patients. Patients locate the teaching in the real world, provide more authentic learning experiences and help to ensure that the teaching is relevant. Patients as well as the teacher can provide feedback to the student about their techniques, attitude and communication skills.

The range of patients seen by students in a clinical attachment should reflect the expected learning outcomes. This can be recorded in a portfolio and any gaps identified in a student's clinical experience should be remedied. Students who use an electronic hand-held device to document their patient encounters do so more completely. Patients can be selected for clinical teaching on the basis of their presenting problems, their availability and their willingness and ability to cooperate with the teaching programme. It is important to obtain full patient consent before students interact with the patients and it is important that the patient's comfort and dignity are respected. Patients may feel they have benefited from the experience.

PLANNING

As with all teaching approaches, planning is important. The expected learning outcomes must be clearly defined and communicated to the student. These may include skills in history taking, mastery of practical procedures and an understanding of ethical issues.

Appropriate learning opportunities, both formal and informal, should be scheduled in the learner's work plan. Teachers responsible for a formal teaching session should make arrangements for someone to cover their other commitments so that they are not interrupted by bleeps or other calls.

IMPLEMENTING

In a formal clinical teaching session students should be actively involved and engaged. They should feel free to ask questions and ask for help if required. They should be encouraged to reflect and think about the patients they see. Students can be helped to do this by the use of skilful questioning by the teacher, the aim of which includes:

- Arousing the learner's interest, e.g. 'How often do you think a general practitioner will see a patient with a thyroid problem?'
- Testing the learner's knowledge of the subject, e.g. 'Is this a reliable indicator that the patient is hyperthyroid?'
- Promoting the student's understanding and encouraging the student to reflect on the topic and stimulate their critical thinking, e.g. 'Which of the treatment options available would you advise in this case and for what reason?'
- Encouraging the learner to relate theory to practice: 'What is the explanation for the patient's tachycardia?'
- Inviting comparisons or different viewpoints, e.g. 'What is different in this patient from the last patient we saw?'
- Consolidating the learning through encouraging the trainee to review and summarise the learning that has occurred, e.g. 'What have you learned today from the experience?'

As a teacher you need to learn to be comfortable with silence. Give the students at least three to five seconds to think between asking a question and expecting an answer. Insufficient attention is paid to the art of questioning in staff development programmes. We have found the skill lacking even in experienced teachers.

As well as questioning the learner, it is important for the teacher also to be a good listener. You need to hear and understand what is being said and respond accordingly. Non-verbal behaviours are also important so try to maintain eye contact with the student.

In clinical teaching the provision of feedback to the learner is of particular importance. Feedback is an essential part of the learning process. It provides students and trainees with information about their performance and how they can improve upon it. It needs to be given skilfully if you want to motivate your students. The feedback should be timely, descriptive rather than evaluative, and specific rather than general. Try to provide positive suggestions and not just negative comments. This is discussed further in Chapter 2.

CLINICAL SUPERVISION

In postgraduate training programmes, the clinical supervisor provides the trainee with guidance and feedback on matters of personal, professional and educational development in the context of the provision of safe and appropriate patient care. Clinical supervision is important, but how it is carried out is highly variable. The clinical supervisor is responsible for:

- finding out the aspirations and career intentions of the trainee
- recognising the strengths and weaknesses of the trainee and adapting the training to the trainee's needs
- meeting regularly with the trainee to discuss the expected learning outcomes
- monitoring the trainee's progress and giving frequent and constructive feedback
- encouraging the trainee to be reflective by keeping a diary or portfolio of the clinical cases encountered
- being available to the trainee when support or advice is required
- offering counselling to the trainee if the need arises
- keeping the trainee motivated by being positive yourself
- keeping their personal knowledge base and practice up-to-date.

REFLECT AND REACT

1. Think about how you can ensure that your students or trainees achieve the expected learning outcomes when so much of their clinical experience is opportunistic.
2. Is sufficient care taken to inform and obtain consent from patients who participate in the clinical teaching and are they asked for feedback?
3. Do you adequately monitor the progress of students or trainees for whom you are responsible and provide them with frequent and constructive feedback?

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Dolmans, D.H.J.M., Wolfhagen, I.H.A.P., Essed, G.G.M., et al., 2002. The impacts of supervision, patient mix, and numbers of students on the effectiveness of clinical rotations. Acad. Med. 77, 332–335.
The effectiveness of clinical rotations depends on high quality student supervision.

Dornan, T., Littlewoods, S., Margolis, S.A., et al., 2007. How Can Experience in Clinical and Community Settings Contribute to Early Medical Education? A BEME Systematic Review. BEME Guide No. 6. AMEE, Dundee.
Evidence as to the value of clinical experiences early in the curriculum.

Irby, D.M., Papadakis, M., 2001. Does good clinical teaching really make a difference? Am. J. Med. 110, 231–232.

Ramani, S., Leinster, S., 2008. Teaching in the clinical environment. AMEE Guide 34. Med. Teach. 30, 347–364.
An overview of clinical teaching with practical guidelines.

Spencer, J., 2010. Learning and teaching in the clinical environment. In: Cantillon, P., Wood, D. (Eds.), ABC of Learning and Teaching in Medicine, second ed. John Wiley and Sons, Chichester (Chapter 8).
A short overview of clinical teaching.

Sutkin, G., Wagner, E., Harris, I., et al., 2008. What makes a good clinical teacher in medicine? A review of the literature. Acad. Med. 83, 452–466.
A description of what is known about the attributes of a good clinical teacher.

Simulation of the clinical experience

25

Simulated patients, manikins, models and computer simulations all complement experience with 'real' patients and have a place in a training programme.

The importance of learning in the clinical context was emphasised in the previous chapter. A key element in clinical teaching is the patient. There is now good evidence that exposure to the 'real patient' can be augmented usefully with a simulated experience. Simulated patients and patient manikins or models are widely used and have been found to be of value in undergraduate education and postgraduate training to complement the student's experience with real patients. Some teachers have been sceptical about the use of simulation in medicine but its value is now proved. Simulation should be seen as a prelude to doing the real thing on a real patient, never as an end in itself.

In this chapter we look at different types of simulation, the educational strategies that need to be adopted and the concept of the clinical skills centre.

REASONS FOR SIMULATION

Teachers should be familiar with the role that simulation can play in a training programme. There are many reasons why simulation is seen as an essential rather than an optional element:

- 'Real patients' may not always be available for clinical teaching. With changes in healthcare delivery patients' stay in hospital is now shorter and during their stay they are occupied with investigation and treatment procedures. Patients may be less willing to have repeated exposure to students.
- With simulation every student can receive a guaranteed and standard clinical experience. Unlike with real patients a simulated experience can be made available to students at the most appropriate time to fit in with their learning programme.
- Repetitive practice is recognised as a key element in the acquisition of clinical skills. Learners can practise with the simulator until they have achieved the necessary mastery of the skill.
- Students are now introduced to clinical experiences earlier in many curricula and preparation on simulated patients and simulators can prepare them for their work with real patients.
- Trainees can be exposed to uncommon situations or rare clinical events that they may not encounter in their routine clinical experience.

- The management of crisis events can be practised and rehearsed so that students and trainees are better prepared should such events occur in real life. Airline pilots are trained in this way and simulators enable the pilots to deal with extreme situations such as engine failures.
- Students can learn a procedure in a risk-free environment. Learners can make mistakes and appreciate their consequences without causing harm to patients. Indeed in some areas it is now a requirement that a doctor demonstrates mastery of a procedure on a simulator before being approved to perform it on a patient. Uncoupling injury from learning sends a message to the public that patients are not 'a commodity' for training.
- Doctors need to be able to work as a member of a team. Simulation can address not only the acquisition of individual technical skills but also be used to train the learner to work in a coordinated and effective manner as a member of a team.
- The assessment of a learner's mastery of a clinical skill is important. Simulated patients and simulators can be used for this purpose in examinations, including high stakes examinations, to assess the learner's mastery of a skill as described in Section 5.
- Simulation can be used to provide students with a motivating and engaging learning experience. This can be designed to challenge the students, encourage their reflection and provide feedback about their performance. The experience can be customised to meet the needs of the individual learner.

APPROACHES TO SIMULATION

There are three approaches to simulating the real patient:

1. *Simulated patients.* These are individuals trained to play the role of a patient.
2. *Simulators or manikins.* These are devices or models that represent the functioning of the body or part of the body and with which the student can interact.
3. *Virtual patients.* The patient is represented in a computer simulation.

A hybrid approach has been developed by Kneebone and others that skilfully combines different patient simulations. A simulated patient, for example, can be used with a pelvic model attached. The student catheterises the 'patient', while at the same time communicating about the procedure with the simulated patient.

CHOICE OF SIMULATION

A number of factors should be taken into consideration when choosing the simulation approach to be adopted:

- **The expected learning outcomes.** Simulated patients are the obvious choice if communication skills are the expected learning outcome. Computer-based programs designed for the purpose also have a role to play in communication skills training. If skills in auscultation are the required

learning outcome, a manikin such as the Harvey cardiac simulator is appropriate. Virtual patients can contribute to decision-making, problem-solving and patient-management skills.

- **The level of fidelity required.** Simulators vary in how similar they are to the real situation they are designed to simulate. A high fidelity simulator may be unnecessarily complex and expensive, and a simple piece of plastic simulating a wound on the skin may be adequate to teach suturing skills. A higher fidelity simulator may be required in a high stakes examination but may not always be necessary in a training situation. However, students tend to be more engaged with a high fidelity simulation that more closely resembles a patient.
- **The availability of simulators.** This may be a limiting factor. If students do not have immediate access to a clinical skills centre with a full range of simulators, it may be possible to arrange access to a nearby centre. If a bank of simulated patients is not available, a simulated patient can be trained to meet the needs of a programme but this can be time consuming. Virtual patients that can be shared online across institutions and modified to suit a local context are now available.

SIMULATED PATIENTS

A simulated patient is a person who has undergone various levels of training to portray a role or mimic a particular physical sign for the purposes of teaching or assessment. The term 'standardised patient' has been used when the person has been trained to play the role of a patient consistently and according to specific criteria. There are circumstances where a high degree of reproducibility is required in order that each student faces the same situation. This is important in the context of assessment.

Students interact with simulated patients as though they were taking a history from a real patient or examining or counselling them. Uses of simulated patients include:

- teaching and assessing history-taking and communication skills
- providing the student with the experience of counselling a patient in a difficult or sensitive area such as cancer where the use of a real patient would be inappropriate
- teaching and assessing physical examination
- teaching and assessing intimate examination of the genitalia.

Barrows (1993) and others have described how simulated patients can mimic a wide range of physical findings from an acute abdomen to spasticity. Simulated patients can be trained to portray various levels of difficulty appropriate to the stage of the learner. The simulated patient may provide a simple account of his or her history on being questioned by the learner or the patient can be programmed to be aggressive and difficult with a confusing or muddled history. Simulated patients can be trained to represent different settings of care including ambulatory care and general practice. A special group of simulated patients are recruited specifically to provide students with opportunities to learn the skills of male and female genital and digital rectal examination and female breast examination.

A significant advantage of simulated patients is that the patient can be trained to provide the students with feedback about their performance.

RECRUITING AND TRAINING SIMULATED PATIENTS

Simulated patients may be professionally trained actors, lay volunteers or healthcare professionals. The training of simulated patients takes time and effort and with a new recruit it is estimated that about two to three hours is required to deliver a good simulation. More detailed training may be necessary if the simulation is complex or if the simulated patient is required to assess the student's performance and provide feedback. Some Clinical Skills Units develop and maintain a bank of simulated patients.

Real patients may be trained to present their history and findings for the purpose of teaching and assessment in the same way as simulated patients.

SIMULATORS (MANIKINS AND MODELS)

Over the last two decades, manikins or models have been increasingly used to simulate 'real' patients in the teaching of clinical and practical skills and are now part of mainstream medical education. Simulators enable learners to practise patient care in a controlled and safe environment. The level of the sophistication of the manikins and models varies. At one end of the spectrum, simple models can be used that allow students to practise their skills in breast examination, prostate examination, wound closure, catheterisation, injection techniques and many other techniques and procedures. At the other end of the spectrum there are sophisticated models such as 'Harvey' – a life-sized cardiovascular patient simulator that can depict the auscultatory, tactile and visual findings for a broad range of cardiac problems (Fig. 25.1).

Computers can be integrated into whole- or part-body manikins, controlling the model's physiology and with the output shown as graphic displays on a monitor. A further development is the use of computer-based haptic systems that provide the learners with tactile sensations.

Simulators vary in their sophistication with regard to the extent to which they mimic the real-life situation, whether they provide feedback to the learner and the range of tasks and abnormalities that can be simulated.

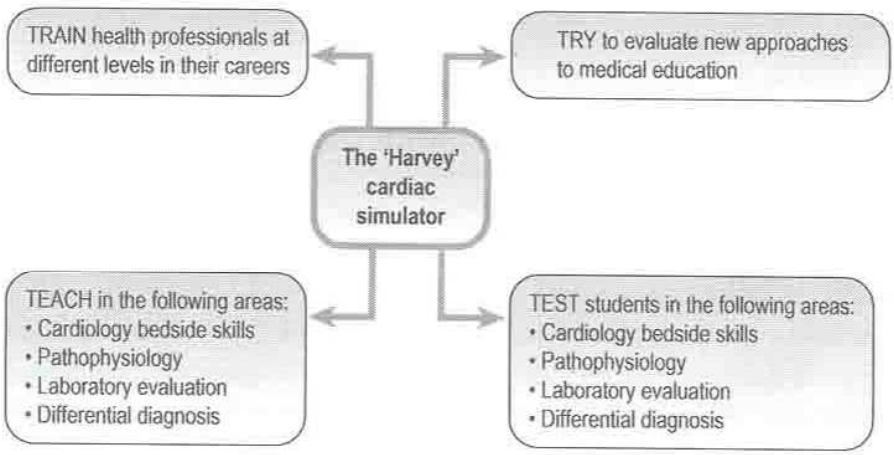

FIG 25.1 Examples of the uses of the 'Harvey' cardiac simulator.

There is good evidence that the skills gained from practice on a simulator transfer to real patients. Issenberg et al (2005) in a systematic review of the use of simulators identified key features that contribute to their educational effectiveness:

- **Provision of feedback.** Not surprisingly this was identified as an important feature of simulation-based medical education. (Feedback, the 'F' in 'FAIR', was discussed in Chapter 2.)
- **Repetitive practice.** Simulators provide an opportunity for learners to engage in *deliberate practice* where the learner engages in focused and repeated practice with the learning outcomes clearly defined. (Activity, the 'A' in 'FAIR'.)
- **Curriculum integration.** Simulation-based learning is most effective when it is embedded in the curriculum and not seen as some extraordinary event.
- **Range of difficulty level.** Effective learning is enhanced when learners have opportunities to engage in the practice of medical skills across a wide range of difficulty levels. (Individualisation, the 'I' in 'FAIR'.)
- **Capture of clinical variations.** The representation of a wide variety of problems or conditions as related to clinical practice. (Relevance, the 'R' in 'FAIR'.)
- **A non-threatening environment.** The use of simulators is most valuable where mistakes by learners are expected and not criticised, and where these are regarded as 'teachable moments'.
- **Individualised learning.** The learning on the simulator should be adapted to individual learning needs. This may mean that some students will require longer and more practice on the simulator than others. The level of difficulty of the presentation on the simulator may be altered to match the needs of the student. (Individualisation, the 'I' in 'FAIR'.)
- **Defined outcomes.** The expected learning outcomes for using the simulator should be defined and related to the overall outcomes of the curriculum. (Relevance, the 'R' in FAIR.)

COMPUTER SIMULATIONS AND VIRTUAL PATIENTS

Real patients can be simulated electronically as virtual patients that can be used in interactive computer simulations of real-life scenarios. The virtual patient has two components:

1. information about the patient including history, physical findings, laboratory and other investigations and the patient's progress
2. the learner's interaction with the case.

ADVANTAGES OF VIRTUAL PATIENTS

Virtual patients can be accessed on demand, perhaps even more so than simulated patients and manikin simulators, making them a very useful educational tool that offers a number of advantages:

- Virtual patients can be used to provide students with a wider range of patient scenarios than they may encounter in the real situation.
- The learner can take on the role of the doctor and no harm can result from any mistakes made.

- A holistic approach to patient management can be encouraged. The learner can interact with the patient and engage in reflection and clinical reasoning, while at the same time recognising professional and ethical issues.
- The virtual patient can highlight the integration of theory and practice, and the basic sciences with clinical medicine.
- Virtual patients can be used for teaching and learning and for assessing learners with the learners receiving feedback.
- Virtual patients can demonstrate the continuity of care with the same patient located over time in different contexts including general practice and the hospital setting.

USES OF VIRTUAL PATIENTS

Virtual patients can be used in a number of ways, for example:

- to support a traditional curriculum or learning programme, complementing the lecture and clinical experiences
- as the triggers or problem presentation in a problem-based learning curriculum (see Chapter 14)
- to support independent learning with students individually working through the case scenarios
- in collaborative learning with students working through a virtual patient scenario in pairs or in a group.

With technology developments, virtual patients are now more freely available on the internet or from commercial sources. In the past the wide range of instructional design and authoring tools had a negative impact on the transferability and sharing of virtual patients between different centres and institutions. Virtual patients developed in one context could not be adapted for use in another context and it was difficult if not impossible for teachers to alter a patient's presentation or investigations to fit in with their own context. There has been a significant move to more collaborative development and sharing of virtual patients with the implementation of a common standards specification. The Medbiquitous Virtual Patient standard has provided a stimulus.

As technology advances it is likely that we will see increasing use made of virtual patients in the training and assessment of students and trainees in all phases of their education.

CLINICAL SKILLS CENTRES

There has been a growing interest in the role of clinical skills centres as a setting for teaching and learning clinical skills. A clinical skills centre is usually a central area that houses a range of resources including simulators and simulated patients that can be used to assist students to master the appropriate clinical skills. The experiences students gain in a centre complement their dealings with real patients in other clinical contexts. Inter-professional education, with joint learning for different healthcare professionals, can successfully take place in the 'neutral setting' of such centres.

REFLECT AND REACT

1. Simulation is a powerful teaching and learning tool in medical education and a rich variety of simulators are now available. Some of these may be readily available to your students or trainees while others including high fidelity manikins may only be available in a central facility such as a clinical skills unit. What simulators do your students have access to?
2. Could greater use be made in your training programme of simulators, simulated patients or virtual patients? Which of the reasons given for simulation apply in your situation?
3. Prepare students for their simulated experience. This includes briefing the students about the expected learning outcomes and what is expected of them in the session. You should familiarise yourself with the simulation prior to the teaching session.
4. Work with the students during their use of the simulator. The extent to which you do this will vary depending on the complexity of the simulator and what is expected of the students.
5. Debrief the students following the simulation. This is an essential part of the process and will allow you to review what the students have learned and to provide them with feedback.

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Barrows, H.S., 1993. An overview of the uses of standardized patients for teaching and evaluating clinical skills. Acad. Med. 68, 443–453.
An early account of how simulated patients can be used in medical education.

Berman, N.B., Fall, L.H., Chessman, A.W., et al., 2011. A collaborative model for developing and maintaining virtual patients for medical education. Med. Teach. 33, 319–324.
A description of how virtual patients can be shared between centres.

Cleland, J.A., Abe, K., Rethans, J.J., 2009. The use of simulated patients in medical education. AMEE Guide No. 42 Med. Teach. 31, 477–486.
A useful practical guide.

Collins, J.P., Harden, R.M., 1998. The use of real patients, simulated patients and simulators in clinical examinations. AMEE Guide No. 13 Med. Teach. 20, 508–521.
A description of how patients can be represented for teaching and assessment purposes.

Huang, G., Reynolds, R., Candler, C., 2007. Virtual patient simulation at U.S. and Canadian medical schools. Acad. Med. 82, 446–451.
An exploration of the educational value of virtual patients.

Issenberg, S.B., McGaghie, W.C., Petrusa, E.R., et al., 2005. Features and uses of high-fidelity medical simulations that lead to effective learning. BEME Guide No. 4. Med. Teach. 27, 10–28.
A review of the use of simulators and a description of the features that can lead to effective learning.

Med. Teach. 2009. 31 (8), 683–770.
This issue of Medical Teacher has virtual patients as its theme.

E-learning

26

The internet and resources available online have revolutionised medical education. They can make a significant contribution to your education programme.

INTRODUCTION

Lectures, small group teaching, teaching in the clinical context and independent learning all have an important role to play in an educational programme as described earlier in this section. E-learning too is now considered mainstream medical education. It is no longer a fad for the technologist or computer enthusiast, or an esoteric application used by a few innovators in the field. It has become part of and integrated into most educational programmes.

E-learning has been shown to be capable of making a difference with regard to the students' learning. Almost every student in a medical school and every trainee doctor spends part of his or her day or week online. They search for information on a topic using Google or some other search engine, communicate with a colleague or teacher, or study a unit, module or course developed in their institution or elsewhere.

WHAT IS E-LEARNING?

E-learning refers to 'electronic learning', in which instruction is delivered through a wide range of electronic means including computer and internet enabled learning. E-learning is recognised as being more than just technology and includes the social dynamics of networking.

Examples of e-learning include:

- independent learning using learning modules available online
- access to information and learning resources online
- web-based synchronous presentation by a teacher to a group of students
- students learning together online in real time, facilitated by a tutor
- asynchronous discussion forums or chat rooms and bulletin boards
- social networks such as Facebook
- interactive multi-media activities including games and simulations online or on a DVD
- virtual patients with whom the learner has to interact
- videos or audio recordings of lectures distributed through online streaming and podcasts using mobile devices such as telephones.

REASONS FOR INTRODUCING E-LEARNING

E-learning encompasses a pedagogical approach that can serve as a response to the challenges and developments confronting medical education. These include:

- an emphasis on student-centred and individualised learning with 'just-for-you' learning, 'just-in-time' learning and 'just-the-right-place' learning
- distributed learning with students learning at different sites
- increased access to medical studies for students from different backgrounds with programmes required to cater for an increasingly diverse group of students
- advances in medicine with the problem of information overload
- the continuum of education from undergraduate through postgraduate to continuing medical education
- international dimensions and globalisation with an expansion of the traditional classroom to include students from around the world
- the changing roles of a doctor with the need to learn new skills and acquire new competencies at different times in their career
- acquisition of the skills and tools that learners need to develop in order to prosper in an information society
- high expectations of students – the 'digital natives' – who come to medical school with more than 10 000 hours experience in e-learning
- collaborative or peer-to-peer learning, which can be significantly facilitated by social media networking
- inter-professional education with non-threatening learning opportunities online where doctors, nurses and other members of the healthcare team can participate
- sharing of rich learning resources with potential financial benefits.

E-learning has an important contribution to make in all of these areas and can serve as the solution or be part of the solution to the challenges.

EDUCATIONAL FEATURES

E-learning can be designed to deliver more effectively and efficiently what can be done with more traditional approaches. Alternatively e-learning can help to bring about a paradigm shift in medical education and serve as a response to the challenges described above. It has been suggested that, like a Trojan horse, e-learning can be introduced not just for the attributes it brings with it but also for the hidden curricular changes included.

E-learning meets the criteria specified in the CRISIS framework for effective continuing education (Fig. 26.1):

Convenience: students and trainees can learn anytime and anywhere.
Relevance: theory can be related to practice with on-the-job learning and the use of virtual patients extending the learner's clinical experience.
Individualisation: e-learning can be designed to meet the needs of individual students in terms of their past experience and learning styles.
Self-assessment: students can be assisted to assess their own competence through questions and assessment opportunities incorporated into the e-learning activity.

Interest: e-learning can be dynamic, engaging, and user friendly if properly developed.
Systematic: an e-learning programme can systematically cover a topic and a curriculum map can be embodied that provides a framework for the student's learning.

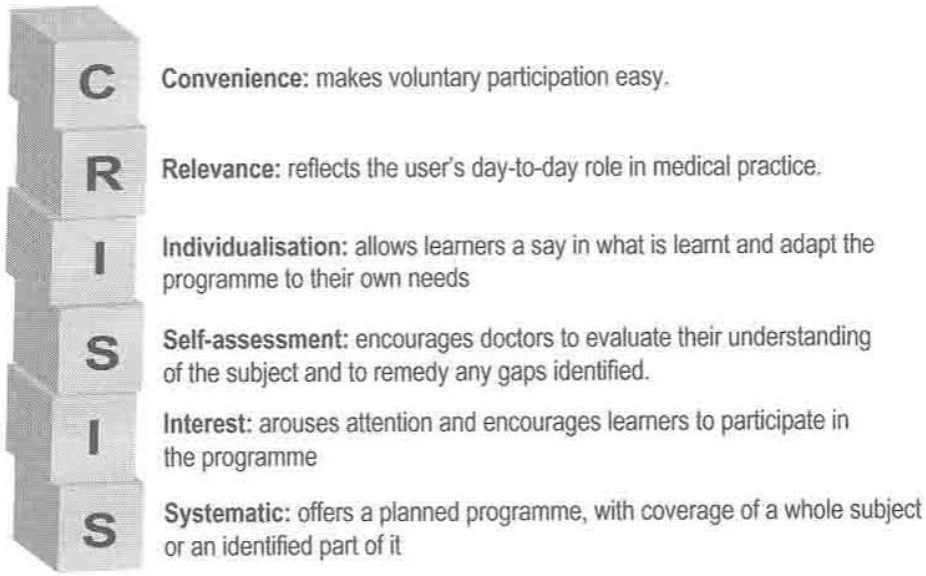

FIG 26.1 The CRISIS framework for effective learning.

THE ROLE OF THE TEACHER

In e-learning the teacher is not redundant. Good collaboration is necessary between content experts, educationists and technologists. All of the roles for the teacher described in Chapter 1 are required but the emphasis in e-learning differs to some extent from what is expected in more traditional situations.

INFORMATION PROVIDER

Information normally provided in a lecture can be made more readily accessible to students through online downloads and podcasts. Existing lectures can be recorded or preferably reformatted to include a greater level of student interaction. The aim is to present information in a way that engages the learner, encourages interaction and tailors the learning to the needs of individual students. Video clips of experts presenting a topic or demonstrating a procedure can be made available to be used at a time most suitable for the learner.

Students worldwide can join live synchronous presentations by a lecturer using web-based platforms such as Wimba.

The role of the teacher is not simply to provide the student with information. The teacher's responsibility is to provide for the student the key to open the door to the rapidly expanding amount of available information. Students should be given guidance on the use of tools such as Wikipedia, YouTube and Google.

ROLE MODEL

Teachers facilitating learning online serve as role models for the students and can play an important part in shaping their attitudes and professionalism. Unfortunately staff may not be the best role models with regard to the use of e-learning or how information is accessed online. Prensky (2006) has described students as the 'digital natives' and staff as the 'digital immigrants'.

FACILITATOR

In e-learning the role of the teacher shifts significantly from delivering information and knowledge to one of supporting the learner. This can be done in a number of ways. Teachers can encourage and help students to acquire the skills of finding out information for themselves, and can guide the students with regard to accessing and assessing the quality of sources of information. In online collaborative learning the teacher has an important role as an e-tutor or e-mentor. Working with learners online requires particular competencies and approaches by the tutor.

ASSESSOR

Computers and information technology have an important role to play in assessment by making it possible for an assessment component to be incorporated into learning resources. Students can be encouraged to assess their achievement of the learning outcomes and to adjust if necessary their pace and path through the learning programme. Assessment should be viewed no longer as 'assessment *of* learning' but 'assessment *for* learning' and this provides a richer learning experience for the student. This concept is highlighted in Chapter 28.

Computers can be used to improve the effectiveness and efficiency of delivering traditional examinations, in scoring the student responses, and in the provision of feedback to the learner. Progress has been made with regard to online assessment for both formative and summative purposes. While the approach offers potential benefits it needs to be carefully managed to ensure that the examination runs smoothly. With summative assessment it is essential to ensure that adequate hardware and back-up systems are available. The AMEE Guide 39 covers many of the issues of online e-assessment (Dennick et al 2009).

The future may see the development of new approaches to assessment including adaptive assessment based on individual student responses and more authentic assessment related to medical practice.

CURRICULUM PLANNER

It is unusual to find in medicine a course that is entirely based on e-learning. There is a growing trend for a blended learning environment where the best of e-learning is combined with the best of face-to-face instruction. We are seeing a convergence between two learning environments and this may be the single greatest unrecognised trend in higher education today. The challenge for the teacher or trainer is to plan a curriculum that embraces both approaches.

Planning a blended approach may mean reconceptualising the role of lectures and placing a greater emphasis on independent learning. It gives the teacher the opportunity to provide students with learning experiences that might not otherwise be accessible to them and to offer a more student-centred approach to learning. The curriculum can be planned round a virtual practice. It can provide more personalised adaptive learning geared to the students' individual needs and opportunities can be scheduled for collaborative learning with students working together locally and internationally. In a problem-based learning discussion group, the problem may be presented to the student as an online simulation. When the need for further information is identified during the discussions, students can search for this online.

Some medical schools and some postgraduate bodies have made an organisational commitment to blend face-to-face and computer-based learning while others have ignored the opportunities offered. In one school we visited, e-learning had been rejected by the teachers with no e-learning contribution scheduled in the formal curriculum. We found on talking with the students that they were making their own arrangements and on average were spending 2½ hours a day online networking, emailing, or studying material they had personally found on the web.

With time, e-learning will feature more prominently in the medical curriculum and should not be ignored by curriculum planners or course designers.

RESOURCE DEVELOPER

The development of resources that combine appropriately the pedagogy and the technology is not an easy task. It requires a range of specialised skills that few teachers possess. A team approach is necessary involving content expert, instructional designer, educationist and technologist. Much has been written about this subject, and the 10 steps in the production of an e-learning programme are described in an AMEE guide (Harden et al 2012).

Most teachers will not wish or have the time to engage in the development from scratch of an e-learning programme. There are simpler ways to make a contribution. Resources can be created in the form of podcasts or recorded lectures. While this approach has limitations, in practice it has been found to serve a useful purpose. Another option is for teachers to use material that has already been developed and, if copyright permits, incorporate all or part of it into their own teaching programme. An animated sequence or a simulated patient can be incorporated into a lecture or self-learning programme. Repositories such as MedEd Portal offer a variety of content including video clips, images and self-assessment exercises.

If learning resources are identified as being of possible use for students, value can be added if the content is annotated by the teacher in order to put it in the perspective of the local context. Information about the resources with the annotations can be incorporated into the student's study guide.

If teachers are more ambitious, and with the author's permission, the published material can be used as a starting point to build their own resources. A number of authoring systems are available that can help teachers who lack the necessary technical expertise to create their own e-learning programme.

REFLECT AND REACT

1. The future is blended learning. As a teacher think what this means for you in your course and whether you have the optimum mix of face-to-face and e-learning.
2. Be aware of the range of tools available including synchronous and asynchronous online learning, podcasts and social media.
3. Consider your role in e-learning. Do you serve as a role model for your students with regard to accessing information online and using learning resources?
4. Is your aim to make your teaching more effective and efficient using e-learning or is your aim to use e-learning to benefit your students in ways not otherwise possible, for example by personalising their learning?

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Cartwright, C.A., Korsen, N., Urbach, L.E., 2002. Teaching the teachers: helping faculty in a family practice residency improve their informatics skills. Acad. Med. 77, 385–391.
This article describes how teachers can become role models for their students in the area of informatics.

Dennick, R., Wilkinson, S., Purcell, N., 2009. Online eAssessment. AMEE Guide No. 39. Med. Teach. 31, 192–206.

Ellaway, R., Masters, K., 2008. e-Learning in Medical Education. AMEE Guide No. 32. AMEE, Dundee.
A description of how e-learning is now part of mainstream medical education.

Harden, et al., 2012. Ten steps in planning an e-learning course. AMEE Guide. In press.
A practical guide to the production of an e-learning programme.

Med. Teach. 2011. 33 (4), 265–333.
This themed issue includes a number of articles on the current situation and future development with regard to e-learning.

McKendree, J., 2010. E-learning. In: Swanwick, T. (Ed.), Understanding Medical Education: Evidence, Theory and Practice. Wiley-Blackwell, Chichester, pp. 151–163 (Chapter 11).
Effective e-learning should be viewed as a curriculum design issue.

Ruiz, J.G., Mintzer, M.J., Leipzig, R.M., 2006. The impact of e-learning in medical education. Acad. Med. 81, 207–212.
A comprehensive introduction to e-learning.

Sandars, J.E., 2011. M-learning. In: Dent, J., Harden, R.M. (Eds.), A Practical Guide for Medical Teachers. Elsevier, London (Chapter 32).
A description of how mobile devices can be used to create new possibilities for teaching and learning on the move.

IF YOU HAVE MORE TIME

Clark, R.C., Mayer, R.E., 2007. E-learning and the Science of Instruction – Proven Guidelines for Consumers and Designers of Multimedia Learning, second ed. Jossey Bass, Chichester.
An introduction to some of the theory underpinning the use of e-learning.

Littlejohn, A., Pegler, C., 2007. Preparing for Blended E-learning. Routledge, London.
A description of the core skills required by teachers in blended learning.

Prensky, M., 2006. In: Don't Bother Me Mom – I'm Learning! How Computer and Video Games Are Preparing Your Kids For Twenty-first Century Success – and How You Can Help! Paragon House, Minnesota (Chapter 4).

Peer and collaborative learning

27

Students learning from each other is effective. This can be informal or incorporated into scheduled activities.

INTRODUCTION

Watching my 5-year-old grandson learn to use a computer, I (RMH) noted that he did not learn from the instruction manual, from his parents or from instruction at school. He learned from his 7-year-old sister. This is not surprising. Much of what we learn in day-to-day life is from friends and colleagues. It has always been a feature of how students learn at medical school. The difference today is that the value of learning in this way is appreciated and is given a more formal role in the curriculum. Students engaged in peer-to-peer (P2P) and collaborative learning tend to have a greater mastery of the expected learning outcomes with higher test scores, higher self-esteem, greater interpersonal skills and a greater understanding of the content they are studying.

DEFINITION

A range of terms such as 'P2P learning', 'collaborative learning' and 'cooperative learning' have been used to describe how students can learn with and from each other in formal and informal settings. Distinctions are sometimes drawn between the terms but frequently they are used interchangeably.

P2P LEARNING

P2P learning has been defined by Topping (1996) as 'people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching'. One student assumes the role of teacher or tutor while other students assume the role of learners or tutees. Students may switch their role from tutor to tutee. Usually, to guide students in their role as tutor, some instruction is given in teaching skills.

COLLABORATIVE LEARNING

In collaborative learning students learn from each other without the assignment of specific roles of tutor and tutee. Students work together as members of a group or team to solve a problem, complete a task or create a product. It is

through working together that students learn. There is a sharing of authority and acceptance of responsibility among group members for the group's actions. The group may be assessed by the activity and product of the group rather than the individual's activity or achievements within the group. The term 'cooperative learning' rather than 'collaborative learning' has been used where there is more structure and organisation given to the group activity but the terms are often used interchangeably.

EXAMPLES OF P2P AND COLLABORATIVE LEARNING

P2P or collaborative learning may be adopted in the medical curriculum in a range of formats (we have not distinguished between the two approaches as there is often an overlap):

- Students are given the role of tutor in slots scheduled in the curriculum.
- Students form informal partnerships to assist each other.
- Students work in groups in the context of problem- or team-based learning.
- Students work in pairs facilitating each other's learning.
- Students collaborate in a project or in practical work such as anatomical dissection.
- Students work as members of an inter-professional group in a community-based project.
- Students work online as members of a formal discussion group with a specific task as the focus.
- Students share their experiences and information with others through a social network such as Facebook.
- Students collaborate in the development of educational resources or textbooks that they share with others.
- Students have the responsibility for assessing each other's achievements in an area such as professionalism (peer assessment).
- Students in more senior years or junior doctors teach junior students.

BENEFITS TO BE GAINED BY P2P AND COLLABORATIVE LEARNING

The institution or medical school and the learner can benefit in a number of ways if collaborative learning is incorporated in the curriculum:

- Students can learn effectively from their peers, in particular where there are problems relating to complex learning and concept manipulation.
- Learning outcomes less easily achieved through other methods are promoted. These include interpersonal skills, communication skills, higher level thinking skills, skills of critical appraisal and team working skills.
- Students are helped to develop their confidence and self esteem.
- Students are prepared for life-long learning as the classroom more closely resembles real-life social and employment situations.
- Students' satisfaction with the learning experience is enhanced with a more positive attitude developed towards the subject matter.

- Students are encouraged to appreciate diversity and to reflect and appreciate different viewpoints and perspectives brought to the discussion by other students.
- Learners working online at a distance have a supportive community environment.
- Additional support for student learning is provided at a time when there is pressure on staff:student ratios.
- An educational environment is created within the institution where collaboration is valued.
- A student-centred learning approach is supported with students taking more responsibility for their own learning.
- Teaching is a powerful learning tool – 'to teach is to learn twice'.
- Students' skills as teachers are developed in line with recommendations from accrediting bodies that medical graduates must be able to demonstrate appropriate teaching skills.
- Students feel engaged and have some ownership of the curriculum.
- The concept of the student as an assessor of other students is supported, in particular in areas such as attitudes and professionalism.
- Students receive significant feedback as part of the learning activity which is not always possible in other situations, particularly in large group learning.
- Experience gained as a student teacher may encourage some students to seek an academic career.

IMPLEMENTATION IN PRACTICE

The successful implementation of P2P and collaborative learning has much in common with the general curriculum development principles described elsewhere in this book. It is important to clarify the expected learning outcomes, to ensure that planning and preparation is adequate, that the process is facilitated by an appropriate education environment, and that there is a match between assessment and teaching and learning. Some specific recommendations are noted below.

P2P LEARNING

The following tips contribute to successful P2P learning:

- Incorporate P2P learning formally into the curriculum and do not consider it only as an add-on extra.
- Schedule the P2P sessions and make the necessary arrangements for students to sign up.
- Decide whether students' attendance is obligatory or whether the P2P sessions are optional.
- Ensure that both the tutors and tutees are aware of how P2P learning contributes to the mastery of the learning outcomes of the course. It is sometimes claimed that the tutor gains as much if not more than the tutee. This includes mastery of teaching skills.
- Ensure that student tutors are fully briefed and have training in the necessary skills. They may be assisted with the provision of learning resources to support the learning.

- P2P tutors should have ongoing mentoring and coaching by staff.
- Choose the form of P2P learning that is most appropriate for your situation. This may involve students in the same year or more senior students or junior doctors acting as tutors.
- In planning and organising P2P learning, a team approach involving both staff and students is useful.
- As with all learning experiences P2P learning should be monitored and evaluated.

COLLABORATIVE LEARNING

The success of collaborative learning can depend on how it is implemented:

- Explain to the students the benefits of the collaborative learning approach and the expected learning outcomes, including the development of interpersonal skills and mastery of the subject content. It is important that they accept them.
- Collaborative learning can be at its most effective with heterogeneous groups where students tend to interact and achieve more compared to working with students more closely matched in their abilities and background.
- The learning tasks can be structured so that students must depend on each other for completion of the task. This involves within the group trust building, conflict management, encouragement and negotiation. Each student should be held accountable for doing their own share of the work. One inter-professional group we saw, as described in Chapter 13, worked well because the solution to the problem presented required the theoretical knowledge of the medical student members of the group and the practical knowledge of the midwives.
- It is important that sufficient time is allocated to collaborative learning. Students need to complete the required tasks and achieve the expected learning outcomes. This creates an atmosphere of achievement in the group. Some of the social benefits may become apparent only after the group has worked together for a number of weeks.
- Students should have the opportunity within their small group to reflect upon and reply to the diverse responses from other group members. The exchange of views in the group should help students to understand better the issues and concepts being discussed.
- It is important to recognise that just because students are working in small groups it does not mean that they are engaging in collaborative learning. It needs to be ensured that students are cooperating with regard to their own learning and the learning of others in the group.
- Each member of the group should contribute to the work and product of the group so that the end result will be better than that achieved by one student, even the best, working independently.
- Encourage students in the group to explain concepts or principles to others and for the explanation to be discussed by the group. This can lead to effective learning for the members of the group.

- The group activities should be organised in such a way that the learning success of each individual and the group as a whole is recognised. We saw this achieved in one setting where an individual was chosen by the teacher at random at the end of the week to present the work of the group. The group was given a mark based on the individual's presentation. The group had to 'sink or swim' together.
- Monitor the group activity and the progress being made by the students in the group. The teacher, when facilitating a group should provide assistance and clarification if required. It is important that the teacher does not dominate the session and convert it into a mini-lecture.

REFLECT AND REACT

1. You may feel uncomfortable delegating teaching responsibilities to a student or trainee. There is overwhelming evidence that this can be effective. Consider how it can be adopted in your situation.
2. Which of the advantages of P2P or collaborative learning listed above apply in your situation?
3. Look at the learning outcomes for your course or curriculum and consider whether some outcomes such as team work could be usefully addressed through P2P or collaborative learning.

EXPLORING FURTHER

IF YOU HAVE A FEW HOURS

Ross, M.T., Cameron, H.S., 2007. Peer assisted learning: a planning and implementation framework. AMEE Guide No. 30. Med. Teach. 29, 527–545.
A description of how P2P learning can be implemented based on experience at Edinburgh Medical School.

Topping, K.J., 1996. The effectiveness of peer tutoring in further and higher education: A typology and review of the literature. High. Educ. 32, 321–345.
A report from an expert in the field.

IF YOU HAVE MORE TIME

Boud, D., Cohen, R., Sampson, J. (Eds.), 2001. Peer Learning in Higher Education: Learning from and with Each Other. Kogan Page, London.

McConnell, D., 2006. E-Learning Groups and Communities. The Society for Research into Higher Education and Open University Press, Maidenhead.