Part 2 Lecturing
Graham Gibbs

Overview

Despite an increasing amount of innovation in teaching in higher education, lecturing is still the most common teaching method and it has been researched more than any other method. This part has selected four areas of research which relate to questions teachers have and problems they face in planning, giving and improving their lectures:

- When should you be lecturing?
- How do students experience lectures?
- Can student feedback help us to improve our lectures?
- What kind of notes should your students be taking?

The extracts used to address these questions, which are based on different kinds of research and different kinds of theorising, illustrate a range of ways of studying and explaining teaching and learning.

The first extract, by Bligh, summarises a wide range of studies which have compared the effectiveness of lectures with that of other teaching methods. His summary argues that lectures are likely to be more effective at achieving some educational goals than others. The extract draws largely on quantitative studies concerned with what works best, regardless of why. Bligh's analysis goes further than the studies themselves, seeking explanations in the ways that memory, learning and attention function.

The second question is addressed with reference to an extract describing a single study undertaken by Hodgson. She criticises the approach taken by Bligh, and also the student feedback literature referred to below. Instead, she adopts a qualitative and descriptive approach in trying to understand and explain students' experience of lectures, and particularly their experience of relevance, from their own accounts. This study makes no attempt to determine what works best or to quantify effectiveness but rather illuminates what students do in lectures. Its aim is insight rather than proof.

The third question is discussed in the light of the large, but almost exclusively American literature concerned with student feedback on teaching and research studies involving detailed observation of lecturer behaviour. The evidence attempts to relate student feedback ratings and detailed observational data on teachers' behaviour to student marks on tests and other measures. The evidence clarifies the extent to which we can trust student feedback and use it to produce worthwhile improvements in teaching.

Some answers to the fourth question are provided by a second extract from Bligh. This summarises a range of studies focused on students' note-taking during lectures, rather than on lecturers - on learning rather than on teaching. The implications for what teachers should do to help students take useful notes are fairly clear.

Building on what you already know

But before beginning to consider the research and theory, we can start from your experience of lectures and consider what holds our interest and
engages us. Even if you had never lectured before, you would already know a good deal about what makes lectures effective. You have probably attended hundreds of lectures of very variable quality and you could tell for yourself which of these were helpful to you as a learner and which were not. You have also seen presentations on television by professionals who know a great deal about how to hold an audience’s attention.

**Activity 2.1 Your experience of lectures**

Use the table below to summarise features of lectures you have experienced and that you would judge as particularly good or particularly bad. Examples taken from some student feedback questionnaires are included to help get you going.

<table>
<thead>
<tr>
<th>Characteristics of the best lectures I have experienced</th>
<th>Characteristics of the worst lectures I have experienced</th>
</tr>
</thead>
<tbody>
<tr>
<td>She gave examples of everything – using video clips or anecdotes after every new idea. He was absolutely passionate about his subject and it infected you.</td>
<td>Information was presented like a ruptured fire hose – no way to stop it. He just read his notes out – I don’t think he realised we could read, in fact I don’t think he noticed we were there.</td>
</tr>
</tbody>
</table>

Make a note of two features of the good lectures that you could usefully imitate. Note two features of the bad lectures that you should make a special effort to avoid.

The best lecturer I experienced as an undergraduate was intrigued by the topics she covered and shared her puzzlement with us. In everything she did, she exposed both the difficulty of arriving at a full understanding and her enjoyment of the quest. She never pretended that she already knew what we were supposed to know; it was just that she had been puzzling longer than we had. She also used more visual aids and handouts than any other teacher I remember. The worst lecturer I experienced presented economics as if everything was already known and set out in the books, if only we lazy students could be bothered to learn it. I had to take detailed notes to avoid falling asleep, but my brain was not engaged. He faced the blackboard and droned.

From these experiences, and others like them, I have learned to present audiences with material to puzzle over. For example, I might ask them to predict the results of an experiment or the
shape of a graph, rather than simply telling them. I have asked how an audience might explain a finding before I present my analysis. I have tried to start with the phenomenon we are trying to understand rather than with the theory that might explain it. My focus of attention is not ‘what do I want to tell them?’ but ‘how can I intrigue them?’

**Reflection 2.1 Your lecture as a TV documentary**

TV documentaries have an audience who chat, get a coffee or switch channels the moment their attention is lost. As a result, TV directors have developed a range of cunning ploys to hold attention. List some of the methods you have observed.

Your own students will have a limited attention span: 15 to 20 minutes is often cited as a reasonable maximum before some kind of break or change is required. Note how you might be able to exploit the methods used in documentaries in your own teaching. You may need to watch a couple of documentaries to remind yourself what they do.

Devices that I have noticed documentaries using include:

- Never staying with one shot for very long, especially if it is a ‘talking head’. So when I am lecturing I try quite frequently to switch my audience’s attention from me and my voice to information on the overhead projector and to handouts. **What do you do to change students’ focus of attention from time to time?**

- Featuring more than one presenter or point of view and setting up a debate rather than a monologue. I have seldom given joint lectures but I do try to use quotations from other people’s work and to explore the views of others who disagree with each other, as a way of shifting attention from my own views. **What do you do to create a sense of dialogue instead of monologue?**

- Inserting music and attractive visual images between periods requiring more intense concentration. I don’t use music but I do include gaps, breaks and short discussion tasks, so that my audience does not have to attend intensively for too long at a time. **What kinds of short break do you allow your students?**

These reflective activities should have reminded you to use the following important questions to connect with your own experience and practice.

### 2.1 When should you be lecturing?

**Beliefs about lectures**

Lectures are still the most common form of teaching in most subject areas and it is important to understand why this is. Teachers claim all kinds of advantages for lectures. For example:

- Lectures are the best way for me to convey information to the students as quickly and effectively as possible.

- Students need to understand the key ideas before they can use them and lectures enable me to explain ideas to them.
Students just don't get such a clear understanding from reading or from discussion.

Students don't always start off with an interest in the subject but lectures can inspire students so that they go off afterwards and buy books and read and study more than they otherwise would. It is my opportunity to transmit my enthusiasm for the subject.

All such beliefs are testable: it is possible to use controlled experiments to see whether lectures can actually achieve what is claimed for them. If teachers are to be rational about their choice of methods then they need to know if lectures (or any other method they might use) really are appropriate or if there are better alternatives. There is a substantial literature concerned with the effectiveness of lectures compared with other methods. This evidence has been available for quite some time: the first edition of Donald Bligh's book *What's the Use of Lectures?* was written in 1971. Much of the research on this issue was undertaken in the 1960s when it was hoped that the scientific study of teaching would lead to clear answers about how teaching should be undertaken.

### Activity 2.2

Before you read Bligh's summary, use the grid below to summarise your beliefs about how effective lectures are, compared with other teaching and learning methods such as independent reading, discussion and project work, for the achievement of three rather different goals. For each cell in the grid, write in one or two teaching or learning methods, such as project work, discussion, guided reading or project work.

<table>
<thead>
<tr>
<th>Lectures better than these methods for:</th>
<th>Lectures same as these methods for:</th>
<th>Lectures worse than these methods for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students' acquisition of factual information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student thought, understanding and problem solving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive change in student attitudes towards subject</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Evidence about lectures

Bligh does not go into detail about individual research studies. Instead, he summarises a large number of studies of a similar kind in what is called a 'meta-analysis'. Such meta-analyses save us a great deal of time and trouble reading difficult articles in obscure journals and make it easy to see what the overall results are.

The methodology of the studies Bligh summarises varies a good deal, but characteristically an hour spent on a lecture with one group of students is compared with an hour spent in some other teaching or learning activity with either the same group or a comparable group of students. What the two groups of students have learned is then measured by various kinds of test. Statistical analysis is undertaken on the test scores to see if there is a significant difference between the effectiveness of the methods being compared. As soon as a question about relative effectiveness is raised, it is sensible to ask: 'Effective at achieving what?' Bligh has clustered the research studies he cites so as to consider the relative effectiveness of lectures in achieving four rather different goals that relate to the three common beliefs expressed at the beginning of this section:

- acquisition of information
- promotion of thought
- changes in attitudes towards the subject
- acquisition of behavioural skills.

Different kinds of test or evidence are used to examine these four areas, such as:

- students' scores on multiple-choice question tests of factual content of the lecture;
- scores on tests of students' ability to solve problems like those covered in the lecture;
- students' responses to questionnaires concerned with interest in the subject or evidence of the extent to which they purchase their own books on the subject, as a result of the lecture.

The conclusions he draws about the effectiveness of lectures for the achievement of the first goal are quite different from those he draws about the achievement of the other three. When you come across evidence about relative effectiveness of teaching methods you too will need to ask, 'Effective at achieving what?' and look to see what kind of measure of outcome was used. Methods are often good for some things but less good for others.

Interpreting evidence about teaching methods

Drawing general conclusions from overviews of research, while technically difficult, is still easier than drawing out specific implications for your own teaching. For example, a research study might find that lecturing produces worse results than another teaching method 'on average'. But averages often mask wide variations. It is intriguing that a small proportion of the studies reported in Bligh's Table 2.4 contradicts his general conclusions, which are based on the most common findings of a large number of studies. How did the teachers in this minority of studies manage to make lecturing work fairly well, when those in the majority did not? Could we
learn as much from these exceptions as from the general findings? As you read, you should ask critical questions about the meaning of the data Bligh reports, and what his conclusions mean for you.

There are other difficulties in interpreting such empirical findings. For example, the second extract, by Hodgson, emphasises the importance to students of the inspirational role of relevance in lectures. This is difficult to square with Bligh’s conclusion that ‘lectures are relatively ineffective to inspire interest in the subject’. Lectures may on average be less effective than other teaching methods in inspiring interest, but you may still feel that it is vital to try to inspire interest when you are lecturing. The evidence Bligh summarises may be more useful in deciding when, rather than how to lecture. As you read, ask yourself what Bligh’s conclusions mean for your lecturing. Further issues about how to interpret and use the results of empirical studies of this kind are explored at the end of this extract.
Table 2.1  The number of experimental comparisons of lectures with other methods where acquisition of information is the main criterion

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Table 2.2  Summary of ninety-one studies comparing teaching methods
As you read the next part of the extract, consider whether the studies reported by Bligh encompass these forms of thinking.
Table 2.3  The number of experimental comparisons of lectures with other methods where promotion of thought is the criterion
Table 2.4  The number of experimental comparisons of lectures with other methods where change in attitudes and values associated with the subject matter is the criterion
### Table 2.5

The number of experimental comparisons of lectures with other methods where increased interest in subject matter is the criterion
Table 2.6  The number of experimental comparisons of lectures with other methods where students' preference for the method is the criterion
Table 2.8  The number of experimental comparisons of lectures with other methods where the development of behavioural skills is the criterion
Doubts about the evidence

Even such apparently confident conclusions as Bligh’s, based on large numbers of studies, may not be entirely convincing or have clear-cut implications. Interpreting empirical studies of this kind inevitably involves many caveats and limitations.

Four areas of doubt are discussed here.

1 Not all of the studies cited are as well designed or conducted as they might have been. Some are rather small in scale and involve fewer controls than would be desirable. Their limitations are not revealed in this kind of meta-analysis, in which details of individual studies are not described. The strength of the overall findings tends to depend on the fact that many different studies have produced similar results, despite differences or weaknesses in their design. It is relatively unusual to find such clear-cut findings in educational research, but there are still doubts.

2 These studies seldom take into account contextual factors such as the competence of the lecturer or the particular content or discipline of the lecture. The evidence involves averages across many different contexts and similar findings in different contexts. The wide differences in the findings of studies about the effectiveness of lectures for the acquisition of factual information may have been caused by gross differences in context between the studies. This leaves individual teachers plenty of scope to argue that these conclusions may apply to ‘average’ lectures, but they certainly do not apply to excellent and inspirational lecturers, such as themselves, to the teaching of special subjects, such as their own, to high (or low) ability students, such their own, or to any other specific context they can think of. And such arguments might just be right. As the evidence has been collected from a variety of contexts with a variety of lecturers and students, it may apply to a wide variety of contexts, but probably not to all contexts.

3 There is always a great deal going on in any teaching situation that has not been controlled or measured in such experiments. While using a lecture rather than a discussion class might make a small difference, whether or not the students spent enough time studying outside of class afterwards might make a much greater one. And the effect of the type of teaching method used for out-of-class studying might have been crucial to the effectiveness of the course and might be more important than the direct impact of the teaching method on recall of facts or understanding immediately after the lecture. Variables, such as those involved with in-class and out-of-class learning, often interact in powerful ways and most experiments control and measure only one or two variables at a time.

4 Experimental studies are not generally undertaken in ‘natural’ contexts, such as the middle of a real course that real students are actually studying, and using the actual exam as a test of outcomes. In order to get the controlled conditions required to study the variables, experiments are often undertaken in artificial ‘laboratory’ conditions. Students may behave quite differently in experimental conditions and in a real course, and real courses tend to be more complex and messy. By simplifying the conditions in order to gain some control, the dynamics of the situation can be destroyed. For example, in practice lectures are not usually the only teaching method used: they are parts of a course in which students are also involved in discussion, reading and other learning activities. A teacher’s choice is not simply between
either lecturing or independent reading but between lectures and reading, or something else and reading. Controlled research studies seldom involve even this limited sophistication and the results may therefore have a limited range of applicability.

It would be easy to find methodological objections to the studies Bligh reports and to reject their findings on these grounds. But if you wanted to believe that lectures were sometimes the best choice for ‘promoting thought’ would you have any evidence to support you, and would it be more convincing than the evidence Bligh cites?

If you have to lecture, what are the implications of Bligh?

In practice, many teachers lecture because they have been allocated a timetable slot called ‘lecture’ with a group of students which is too large to do much else with. The decision to use lectures was made by someone else who has responsibility for the course design, or was forced by resource or logistic constraints, or was simply taken for granted. The problem you may be faced with is what to do, in the light of the research evidence, if and when you have to lecture.

Reflection 2.3  Bligh’s evidence and your lecturing

What do you consider to be the practical implications for your lecturing of the evidence Bligh presents?

For me, Bligh has two main implications:

1. Since students can acquire factual information equally effectively in other ways, I try to use at least some of my lecture time for those things that require face-to-face contact, for example asking and answering questions. I also try to provide handouts and good guidance about sources so that students find it easy to get access to the crucial information outside lectures.

2. I try especially hard to achieve those goals which lectures appear not to be so good at: supporting thinking and attitude change. First, I nearly always include breaks in my lectures to engage students more actively, for example asking them to work collaboratively in pairs or small groups on short problems or tasks I have set. Second, when I have the chance I use lectures to set up student learning activities outside of class, especially ones which involve collaboration and discussion, since these are more likely to lead to thinking and attitude change. I de-brief such activities undertaken since the last lecture.

But I still give lectures!

2.2  How do students experience lectures?

Focusing on the student

The second extract in this part (Hodgson, 1997) differs from the first two in that it is qualitative, based on subjective descriptions rather than on numbers and on students’ internal experience rather than on external studies of what is going on in lectures. It is drawn from a book entitled The Experience of Learning, every chapter of which takes the students’ experience of the phenomenon of learning as its starting point. One of the concepts which pervades this qualitative literature is that of ‘approach’ to
studying. When students in interviews describe what they are doing while they are studying they very often talk about their intention – what they are trying to do with the subject matter they are studying. They often describe taking either a ‘surface’ approach – an intention to memorise or reproduce the material – or a ‘deep’ approach – an intention to make sense of and understand the material. They may succeed or fail in their intention but the fact that they have this intention makes a great deal of difference to what they learn.

When students are in your lectures they are not behaving like tape recorders or video cameras, passively recording what you say and write, even if it sometimes looks like that. They are doing things with your lecture; processing it, writing, thinking. And different students are probably doing different things with different intentions. The studies referred to by Bligh do not take into account such individual differences between students, and they ignore how students experience lectures. Hodgson tries to get inside the world of students as they sit in a lecture and to give an account of how they experience it, and how they ‘approach’ the content of the lecture. She does this not by using questionnaires or testing students, but by interviewing them shortly afterwards, using audio recordings of the lectures to cue their recall.

Making sense of conflicting interpretations

Hodgson refers to Bligh’s summary of the research evidence and to student feedback studies such as those summarised by Murray (1997), and criticises them. She points out that what students learn or what they prefer depends on what they are trying to do in lectures. If students are trying to memorise but the lecturer is trying to encourage creative independent thought then the students are probably going to consider this a bad lecture. Whether the learning outcomes are successful or not will be determined as much by what the student is trying to do as with teacher behaviour. What students tell you about your teaching also tells you about them as learners and about their understanding of learning. To make your teaching effective you may need to pay attention not just to your ‘performance’ but to what students are doing during your performance. You may need to explain to students what you expect them to be doing and check whether this is indeed what they are doing.

**Activity 2.3  What do students do in your lectures?**

If immediately after one of your lectures you were to interview several of your students about how they experienced it, what kinds of things do you think they would say? List half a dozen hunches.

1  
2  
3  
4  
5  
6  

When you have read the extract from Hodgson, come back to your hunches and see if you could elaborate on them, using the insights she provides.
EXTRACT 2.2
LECTURES AND THE EXPERIENCE OF RELEVANCE

Vivien Hodgson
The second part of the Hodgson extract is concerned with the nature of students' experience of lectures, and how it was revealed. Reflection 2.5, which follows the extract, asks you to consider how you could increase the relevance of your lectures, as experienced by your students.
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Three types of relevance

Hodgson distinguishes between three types of experience of relevance: extrinsic, intrinsic and vicarious. She suggests that an extrinsic experience of relevance is associated with students taking a surface approach, while an intrinsic experience is associated with those taking a deep approach. It is clear that an intrinsic experience of relevance is much the most desirable. In its absence, Hodgson emphasises the importance of a vicarious experience of relevance, which teachers can induce through their teaching methods. This idea links forwards to the next section, which includes evidence about those teaching skills that have been identified as effective.

<table>
<thead>
<tr>
<th>Reflection 2.5 Relevance and impact of your lectures</th>
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</thead>
<tbody>
<tr>
<td>1. In what ways do you think your students experienced the relevance of your most recent lectures?</td>
</tr>
<tr>
<td>2. What impact do you think this experience of relevance had on their studying and learning outside of your lectures?</td>
</tr>
<tr>
<td>3. What could you do in your lecturing to maximise students’ experience of:</td>
</tr>
<tr>
<td>• intrinsic relevance?</td>
</tr>
<tr>
<td>• vicarious relevance?</td>
</tr>
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</table>

2.3 Can student feedback help us improve our lectures?

Most if not yet quite all teachers in higher education now receive feedback from their students as a matter of routine and policy. This feedback is mainly collected using questionnaires and much of it concerns ‘performance’ aspects of teaching, especially lecturing. This section is concerned with what is known about various aspects of the use of student feedback and addresses four questions:

- Can students recognise good teaching?
- Do feedback questionnaires measure anything important?
- What kinds of teaching make a difference?
- Can this evidence and student feedback be used to improve teaching?

Research on these questions has been very extensive: for example Feldman’s (1997b) review of the area is based on more than 2,000 articles. It is also often highly technical and sometimes loses sight of the phenomena of teaching in its concern with methodological issues. Instead of using extracts from this often esoteric literature I have explored some of the main issues with reference to a range of sources.

Can students recognize good teaching?

The first question often asked about student feedback is whether students are capable of distinguishing a good teacher from a bad one, or if instead they are unduly influenced by factors such as how entertaining the teacher was, the time of day, etc.
## Activity 2.4 Student feedback

Most teachers have views, sometimes strongly expressed, about the accuracy, fairness and value of student feedback questionnaires. Listed below are some of the statements that critics make. Which of these do you think are likely to be true?

<table>
<thead>
<tr>
<th></th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Students cannot make consistent judgements about the teacher and teaching because of their immaturity, lack of experience, and capriciousness.</td>
</tr>
<tr>
<td>2</td>
<td>Only colleagues with excellent publication records and expertise are qualified to teach and to evaluate their peers' instruction, good teaching and good research being so closely allied that it is unnecessary to evaluate them separately.</td>
</tr>
<tr>
<td>3</td>
<td>Most student rating schemes are nothing more than a popularity contest, with the warm, friendly, humorous teacher emerging as the winner every time.</td>
</tr>
<tr>
<td>4</td>
<td>Students are unable to make accurate judgements until they have been away from the course, and possibly away from the university, for several years.</td>
</tr>
<tr>
<td>5</td>
<td>Student ratings are both unreliable and invalid.</td>
</tr>
<tr>
<td>6</td>
<td>The time and day a course is offered affects student ratings.</td>
</tr>
<tr>
<td>7</td>
<td>Student ratings cannot be used to improve teaching.</td>
</tr>
</tbody>
</table>

Aleamoni (1987) has summarized research evidence showing that every one of the above statements is untrue: they are myths. According to the research evidence students are actually quite reliable judges of teachers in that they agree both with each other and with teachers' colleagues about which teachers are best. They are also able to judge particular qualities of teaching, such as clarity or organisation, with a good degree of reliability. There is some limited evidence of student bias in feedback ratings. For example, students sometimes rate teachers with good superficial "performance" skills rather better than other aspects of their teaching might justify. They also sometimes rate those teachers who award higher grades better than those who award lower grades. You would expect better teachers to produce better
student performance and grades so this could be interpreted as legitimate rather than biased, provided the grades are justified. Apart from these marginal biases, students are much more sophisticated, discriminating and fair as judges of teaching than they are normally given credit for.

Do feedback questionnaires measure anything important?

There is good evidence that teachers do differ in how effective they are. For example, in one study a number of teachers taught parallel student groups on a large calculus course (Frey, 1973). The average marks of students in the group which did least well was 19 per cent lower than in the group that did best, and this was attributed in the study to differences between the teachers of these groups. Teachers do not always make this much difference, but it is clearly possible for them to do so. Teachers differ greatly in the feedback ratings they get from students, and teachers that students have rated highly produce better student results than those they rate poorly (Murray, 1997). In general, student feedback ratings are also good predictors of student motivation as indicated by, for example, how much they enjoy the course, how much they study and whether they enrol on further courses in the same subject area (Marsh and Overall, 1980). Student feedback ratings really do seem to measure something important. Having said this, the kinds of student feedback questionnaires used in the research reported here are generally much more extensive and sophisticated, and better developed, than most of the feedback questionnaires used in the UK. Just because some questionnaires can identify good teachers who are likely to produce better student performance does not mean that all questionnaires are capable of doing so.

What kinds of teaching make a difference?

Feldman (1997a) has ranked various aspects of teaching in terms of how closely each related to student achievement, as measured by examination marks. In Feldman’s overview the aspects of teaching which related most closely to achievement were all skills or teaching processes, such as ‘Teachers’ preparation and organization of the course’ and ‘Clarity and understandableness’. In contrast, ‘Teachers’ knowledge of the subject’ had only a moderate relationship with achievement. ‘Teachers’ research productivity’ was related neither to overall student ratings of teachers nor to student achievement. There are many studies which show that research success is unrelated to teaching success: good and bad researchers are equally likely to be good or bad teachers.

Another myth about lectures, related to the perceived importance of lecturers’ knowledge, is that they should be ‘difficult’, presumably in order to challenge and engage students. Studies reported by Feldman (1997) consistently showed that difficulty was unrelated to effectiveness: deliberately making your lecture ‘difficult’ is as likely to reduce your students’ learning as it is to increase it.

It seems clear that there are aspects of teaching that make a noticeable difference to how well students learn. These involve skills or methods rather than just knowledge. Subject knowledge appears to be less important than how teachers go about their teaching. Research productivity appears to be irrelevant. In order to be able to act on such evidence we need to understand exactly what it is that teachers do which results in students giving them high ratings. It is one thing to know you need to ‘stimulate interest’ but
quite another to know how to do so. One area of research involves not
global student feedback ratings but observing and recording details of
teaching behaviour in the classroom and then seeing which specific aspects
of this behaviour are related to students’ overall ratings and to their
subsequent achievement. Murray (1997) has summarised the literature on
classroom observation of teaching behaviour and concluded that:

- Teachers vary in their classroom behaviour.

- Teachers vary in their effectiveness.

- Some aspects of teacher behaviour are closely associated with students’
  overall ratings of teachers: for example teachers observed to be clear,
  rather than vague, are also rated highly overall. Other aspects of
  teacher behaviour are unrelated to students’ ratings: for example if a
  teacher is observed to be flamboyant, rather than dry, this does not
  predict whether they will be rated highly overall. Some aspects of
  teaching appear to be more influential than others if you want good
  ratings.

- Some aspects of teacher behaviour are closely associated with
  successful learning outcomes while others seem to be less influential.
  Murray concludes: ‘Three dimensions of teacher behaviour have
  consistently emerged as strong predictors of instructional outcomes,
  namely: Enthusiasm/Expressiveness, Clarity of Explanation and
  Rapport/Interaction’ (p. 188). Murray also argues that the role of each
  of these can be understood in terms of cognitive psychological theories
  of the way information is processed in learning. Enthusiasm plays the
  role of attention-getting, without which information is not attended to
  or processed. Teacher clarity plays the role of helping students to
  ‘encode’ information so that it is processed in a way which results in it
  being transferred into long-term memory. Interaction, according to
  Murray, encourages memory retrieval, requiring students to get
  information back out of long-term memory in order to use it during the
  interaction. These kinds of explanation focus on information transfer
  and recall, rather than on understanding of concepts.

- Some aspects of teacher behaviour (such as being well organised) are
  closely associated with how much information students learn, but not
  with how well they understand. Structuring lectures very tightly seems
  likely to improve students’ recording and encoding of information
  during the lecture but may interfere with them relating new knowledge
  to their existing knowledge structures, which could limit their
  understanding.

- Some aspects of teacher behaviour (such as speed of delivery) are
  closely associated with how well students understand, but not with
  how much information students learn. Talking slowly may help
  verbatim note-taking but reduce understanding.

This evidence shows that it does matter how teachers go about their
lecturing, that some aspects of lecturing are more influential than others
and that some are more appropriate for achieving some goals than for
achieving others.

**Can this evidence and student feedback be used to improve teaching?**

Some researchers have used evidence about the links between classroom
behaviour and student performance as a basis for direct advice to teachers.
For example, a study by Cranton and Hilgartner (1981) found that the
more time in a lecture teachers spent on ‘structuring’ (clarifying expectations and relationships) the better student ratings they got, and so they advised teachers to spend more time structuring. They used the same kind of evidence as a basis for advising teachers to spend more time on clarification of material and were able to be specific about recommended kinds of behaviour: ‘generalizing, summarizing, providing connections and paraphrasing are relevant to student ratings of the instructor’s ability to clarify’.

Despite the relative consistency of these findings the evidence explains only some of what is going on, usually accounting for only about one third of all the variation in student performance. Much of the ‘unexplained’ variation is likely to be due to differences in the context: differences between teachers, courses, disciplines and student groups. What might work for one teacher in one context might not work so well for another teacher in a different context. This does not mean that it doesn’t matter what you do when you teach. The evidence shows that it does matter, but context matters as well. The implication is that teachers need to try out different ways of teaching with different groups and in different courses, and see how well they achieve various goals. The research evidence, comprehensive though it is, only takes us so far – after that we have to become researchers ourselves, experimenting informally in our classrooms.

Evidence about whether student feedback is useful to teachers as they carry out these experiments, and whether the use of such feedback can lead to improvement, has been reviewed by Murray (1984). While simply obtaining student feedback has been found to lead to some improvement, what really makes a difference is sitting down with someone who can help you to interpret the feedback and to decide what to do in response to it:

the weight of evidence suggests that feedback from student ratings produces a small but significant improvement in teaching effectiveness ... student feedback supplemented by expert consultation produces a much larger improvement in teaching. (p. 214)

It is the way you as a teacher actively explore the meaning and implications of feedback which produces the positive results. Wilson (1986) found that over half of teachers who had experienced consultation about student feedback achieved significant improvements in teaching effectiveness. The teaching suggestions that produced the largest changes in subsequent student ratings were those that concerned very specific behaviour rather than generalities.

So the evidence suggests that it can be very worthwhile to collect student feedback on your lecturing, to sit down with an educational consultant to discuss this feedback and to focus discussion on details of your behaviour rather than on the content.

**Activity 2.5 Your student ratings**

Which of the following aspects of your lecturing, identified in the literature, do you think your students would rate as 'above average', which 'average' and which 'below average'?

Of these aspects of your lecturing, which do you think make a real difference to your students in terms of their motivation to learn and in terms of how much they learn?
For each of those aspects of your teaching which you suspect that your students would rate as only average or below average, what might you do to improve your rating and improve students’ motivation and learning?

<table>
<thead>
<tr>
<th>Aspect of your lecturing</th>
<th>Above average</th>
<th>Average</th>
<th>Below average</th>
<th>Effect on motivation</th>
<th>Effect on learning</th>
<th>What you could do to improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Enthusiasm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Rapport with students</td>
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<tr>
<td>3 Organisation</td>
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<tr>
<td>4 Speech clarity</td>
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<td>5 Conceptual clarity</td>
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<tr>
<td>6 Informality</td>
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<td></td>
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<tr>
<td>7 Use of AV aids</td>
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</tbody>
</table>

Finally, I suggest that you find out what your students actually think of these aspects of your lecturing!

### 2.4 What kind of note-taking is going on in your lectures?

One of the most obvious things students are doing during lectures is taking notes — and their notes are what students often describe as the main benefit of going to lectures. If your lectures are going to be effective they have to enable students to take notes in ways which contribute best both to their learning during lectures, while they pay attention, listen, think and try to understand, and after, when they use the notes to support their studying and revising. Extract 2.3 below is a second piece by Bligh. It
examines the varied reasons why students take notes and the literature on each. It cites studies which report on what students actually do, whether what they do works, and what note-taking techniques work best. There are clear implications of this evidence both for how you can lecture in ways which aid note-taking and for how you can help students to become better note-takers. Like the Hodgson extract, this piece by Bligh helps focus attention on the learner and what the learner is doing rather than on the teacher.

**Reflection 2.6 How your students take notes**

Before reading the Bligh extract, ask yourself:

1. What motivates your students to take notes?
2. Do you think that your students take accurate and complete notes?
3. Does taking notes in your lectures bring any particular benefits to your students compared with not taking notes, and if so, what benefits?
4. Do you think your students review your lecture notes afterwards and, if so, how and when?
5. What kind of review of your lecture notes would help your students to achieve your goals best?
6. What opportunities do your students take to construct their own understanding of your lecture content, either during your lecture or afterwards?

When you have written your hunches down, read Extract 2.3 and see if its conclusions and explanations coincide with your hunches.

Thinking of a particular class I gave, I would have guessed that:

1. They took notes partly out of habit and partly out of anxiety about what they might be tested on (there were multiple-choice question tests every three weeks).
2. They took incomplete notes, partly because I gave them very full handouts. I don’t know if the notes were accurate.
3. In my class I suspect that taking notes was not necessary. Students already had the information in my handouts, and the periods of presentation were short, so note-taking was not necessary to maintain attention.
4. I’m confident that students used their handouts but suspect that they didn’t use their own notes much.
5. They would have needed to use the handouts to guide the way they tackled mini-research tasks, so it was activity rather than review which would have led to appropriate learning.
6. I used short group activities and discussions at several points so that students could talk about the material. I didn’t use note-taking at all to help them construct meaning.
EXTRACT 2.3 NOTE-TAKING IN LECTURES

Donald Bligh

Students could take notes (A) to help them during the lecture or (B) for later use. These are sometimes described as (A) encoding and (B) storage. In either case note-taking might be helpful (i) to aid memory, (ii) to understand the organization and structure of the topic, (iii) to identify what information is important, or (iv) to ensure that attention has been paid to what has been said ... The overwhelming majority of students rightly believe that lecturers expect them to take notes (Hartley and Davies, 1978; Davy and Dunkel, 1989). Lecturers who don't, cite alternative sources of information as their reason (Isaacs, 1994).

The question now is what evidence is there to recommend note-taking for each of these purposes?

1 To aid memory during the lecture

Note-taking aids memory. It fosters encoding, articulation and rehearsal. There have been a very large number of studies to investigate whether note-taking assists memory of lecture content during the lecture itself. In a typical experiment of this kind half a class takes notes, whilst the other half is instructed not to do so. To control for individual differences, on another occasion note-takers and non-note-takers are reversed. Tests on memory of the lecture content are given immediately after both lectures, or after a specified delay, and results for note-taking and non-note-taking are compared. These experiments have been criticized on the grounds that their circumstances are unnatural, the lectures are often unusually short, students are sometimes told of the tests in advance, the quantity, efficiency and style of notes varies with the type of test anticipated, the topics are not always relevant to their courses and individual differences are seldom considered (cf. Trueman and Hartley, 1978; Carrier and Titus, 1981).

Nevertheless the evidence is overwhelming that note-taking during a lecture does aid memory of the lecture. Indeed Ladas (1980) has cogently argued that experiments ... underestimates the significance of findings. Furthermore several studies using correlations report that the probability of remembering facts noted is significantly higher than those not noted (Howe, 1970b; Aiken, 1975; Thomas et al., 1975; Fisher and Harris, 1973 and 1974a; Crawford, 1925; and Einstein et al., 1985).

2 To aid revision

It seems fairly obvious that students who have notes to revise from, will do better in examinations than students who don't. Available evidence confirms this ...

Furthermore nearly all students use notes for this purpose. Surveys by Hartley and Davies (1978), Davy and Dunkel (1989), Razzell and Weinman (1977), and Isaacs (1994) all attest the importance of note-taking for revision purposes by over 90% of students. Indeed, up to a point the more notes students take, the better they do in examinations (Walden, 1989).

Some researchers have asked which is more important: to aid memory during the lecture (by encoding) or to aid revision (by rehearsal)? The question is part of a wider debate about the importance of encoding perceptions and rehearsing stored memories.

Kiewra et al. (1989, 1991) have shown that for lecturers they are both important. Not surprisingly students who took notes and reviewed them did better on tests of recall
3 To see the developing structure of a topic

Whether note-taking enables students to see the structure and development of a topic during the lecture itself depends on how they take notes. Peper and Mayer (1986) have argued that insofar as note-taking involves encoding, it generates conceptual links in students' minds.

On the other hand, if they simply take a sequential record, maybe under headings and sub-headings given by the lecturer, the links may be restricted and students will only perceive the organization and development if they take time out to look over what they have written as a whole; or if the lecturer takes time to describe and display the lecture's organization. Both these take time, albeit a very short time. If lecturers proceed at such a pace that students can hardly keep up with what is being said, students will be under too much pressure to see the topic as a whole.

However, there is a non-sequential method of note-taking in which the students build up their own conceptions of the structure of the topic as the lecture proceeds. These are usually called networking, patterned notes, tree diagrams or concept maps. Anita McClain (1986) calls them 'mind maps' and the technique was much publicized by Tony Busan (1974). This method results in a branching or network structure of concepts, as shown in Figure 10.4, rather than a traditional sequential record of specific facts using those concepts and reflecting the organization of the lecture.

Tree diagrams can depict the organization of key points in a lecture, but it is difficult to note details by this method. Research comparing the effectiveness of concept maps and traditional linear notes reflects this fact. Comparisons by Dansereau et al. (1979) using prose material suggest that concept maps result in better memory of key ideas, but are not so good for remembering detail. Both methods were considerably better than taking no notes at all, but the degree of difference may reflect the fact that Dansereau gave his students 5 and a half hours training in taking notes as part of a 15-week course in study
methods. Concept maps use fewer words and there is evidence that, when the test is immediate and presentation is short, noting only key words is as effective as recording everything (Howe, Ormond and Singer, 1974). With lectures of normal length, detail is lost. Ideally both methods are necessary, but to use both at the pace of a lecture is quite difficult. McClain claims that concept maps liberate students to think, use both sides of the brain, increase comprehension, set up clear graphic structures that allow easy recall, and encourage creative thinking by their open-ended nature. These claims have yet to be justified.

... Unfortunately students given concept maps to review a lecture demonstrated less accurate comprehension of concepts than those given word lists ...

A further difficulty is that students cannot anticipate or plan the shape and direction of the map on the page when first putting pen to paper. An effective solution to these difficulties is to give a concept map as a handout showing the lecture organization as an advance organizer [...] and let students note details in their own way (Baggett, 1994). It is also easier to search for information amongst concept maps than amongst text (O'Donnell, 1993).

I conclude that if students are to make their own concept maps in lectures instead of traditional note-taking methods, they will need more guidance in how to take them than they usually get; and even then, their effectiveness is uncertain. They may, however, have a role as lecture guides.

4 To relate and reorganize during further study

Arguably to take facts and principles and to reorganize them by interrelating and applying them in order to answer questions and solve problems is an essential part of any academic discipline, and virtually any profession students may enter. If so, to permit further study by interrelating and reorganizing lecture material must be a very important aim in taking lecture notes. Indeed a vital and much neglected part of private study is to interrelate as many different parts of a discipline as possible, not just the facts that are mentioned in the same lecture. Many essay and examination questions test students' abilities to interrelate in this way.

In the past 20 years there has been a great deal of research into student note-taking in lectures and into students' study methods; but there has been very little on how note-taking influences study methods. Nearly all the research assumes that the purpose of note-taking is to aid memory rather than the promotion of thought, further enquiry, or future enthusiasm for the subject.

An important exception is the work of Entwistle and Marton (1994) and their colleagues. They interviewed a small sample of students immediately after their final examinations and asked about their revision procedures. They suggest there are five 'forms of understanding'. Implicitly they are stages of development with some students progressing no further at each stage:

i Absorbing facts, details and procedures related to exams without considering or changing their organization. In effect they

![Figure 10.4 Tree diagram or 'concept map'](#)
revised from a précis of the lecture and scarcely related or reorganized the material at all;

ii Accepting and using only the knowledge and explaining links provided in the lecture notes to form logical organizations of subject matter, such as arguments 'for' and 'against';

iii Relying mainly on notes to develop summary organizations solely to control exam answers;

iv Developing their own organizations of subject matter from theories and strategic reading to represent personal understanding, but also to control exam answers; and

v Developing organizations of subject matter from wide reading which relate personal understanding and involvement to the nature of the discipline.

... One powerful note-taking technique to encourage thought is to generate questions that require students to relate and reorganize information. Students should be taught to use it. Alison King (1992) found that students trained to generate questions at the end of a lecture retained more information after a week than students trained to summarize the lecture and those who reviewed their notes, though the summarizers did better on an immediate test. In another study (King 1991) questions generated during a lecture and answered individually or by partners resulted in better learning than reviewing notes either individually or in pairs both immediately and after 10 days. Similarly, Rickards and McComick (1988) have found that pre-lecture questions enhance the intellectual quality of students' notes.

Why are self-generated questions so effective? Answers to self-generated questions and the questions themselves relate to stored concepts that already have meaning for the students ... In other words self-generated questions and their answers ensure that new information is accommodated within a preconceived organization of ideas. They reorganize the information presented in the lecture.

Reorganizing lecture material is often frustrated because students do not spread out their notes.

Consequently, further information obtained by independent study is noted separately, not visually incorporated into a single organized body of notes. With this learning strategy students are left with sets of notes separated according to their source rather than the relevance of their content. The integration of ideas on the one hand, or their discernment on the other, is thereby made more difficult.

5 To select what is important

There have been several studies investigating how far students are able to select and note what the lecturers themselves deem to be noteworthy in their lectures. Since research shows that students don't remember what they don't note, and it is not possible to note everything, skills in noting what is important become critical.

Several studies show that students lack these skills. It is not so much that their notes contain inaccuracies or errors, though Maddox and Hoole (1975) comment that nearly every senior student in their study made some, and Howe and Godfrey (1977) found that some students omitted negatives! It is that the proportion of important points noted is very variable. For example McDonald and Taylor (1980) report that only half their fourth year students recorded two-thirds of the noteworthy points; and Baker and Lombardi (1985) found that students noted only 50% of a lecture's main ideas. Crawford (1925) reported that students failed to note 47% of the important points; Locke (1977) gave a figure of 40%, and Hartley and Cameron (1967) 76%; while Hartley and Marshall (1974) reported that freshers noted only 56 information units out of a possible 520.

Jackson and Bilton (1990) showed that students were unaware of lecture signals and had difficulty in extracting key concepts from a lecture exposition, particularly when one explanation or definition was embedded in another. Notes by students who could extract important points showed no standard abbreviations or form of shorthand, and displayed poor layout and insufficient relationship between items of information. Hughes and Suritsky (1993) also observed that students with learning disabilities have poor notetaking skills such as paraphrasing, abbreviating and recognizing lecture signals. Where students have difficulty in following a
lecture, they rely almost exclusively on copying from overhead transparencies or the blackboard. Davies (1976) says that oversupply of information leads to confusion when students cannot select appropriately; they cannot cope with individual elements of an argument unless it fits into a wider framework; and these inadequacies can lead to lack of confidence and despondency.

Einstein et al. (1985) reported that both note-takers and successful students remembered points of high importance, while non-note-takers and less successful students remembered points of greater and lesser importance equally. Since recall was related to what was noted, these results were interpreted as a failure by non-note-takers and less successful students to select what was important during the lecture.

All these criticisms of students’ competence, plus the fact that more senior students take more complete notes, suggest that freshers need help to learn note-taking skills, particularly the skills in selecting what is important. Note-taking can become habitual and indiscriminate ... To select what is noteworthy requires thought and judgement. Consequently this is where students need most assistance ...

6 To know what has to be learned

Every discipline is so wide that no one, least of all a student, could be competent in all aspects of it. The content of lectures often indicates which aspects students should select for further study. In this sense, note-taking records the syllabus.

This is particularly the case in subjects such as the mathematical sciences and philosophy which can only be studied by working out problems for oneself. Memory of factual information has a relatively minor role. In these subjects the function of lectures is often to guide students to the problems they should work on in private study, rather than dispense factual information. In effect the syllabus consists of a number of problems. Students do not learn how to solve them by taking lecture notes. They note the syllabus of problems and possible directions to explore them.

7 To maintain attention

It is common experience that if one does not take notes in lectures, the mind tends to wander. Peper and Mayer (1978) claim that note-taking increases attention and results in greater concentration on the material to be learned. Note-taking is an activity which maintains a slightly higher level of arousal because the activity is self stimulating. Neurologically, there is a feedback mechanism to the brain stem which arouses the brain in general. There is some evidence from tests of immediate recall (Crawford, 1925b; Howe and Godfrey, 1977) that the benefit of note-taking is greater when lectures are over 30 minutes. Howe and Godfrey interpret this in terms of note-taking maintaining attention after that length of time.

The converse is also true. Enthusiastic, stimulating lectures result in more note-taking.

On the other hand over half the students in the surveys by Davy and Dunkel (1989) and Hartley and Davies (1978) reported that note-taking sometimes interfered with their understanding of lectures, presumably because their attention was divided. Peper and Mayer (1986) reasoned that, since the whole brain should be aroused by note-taking, memory and thought should benefit equally. However, contrary to their earlier claim, they found problem solving benefited more than factual memory. The attention hypothesis was thus weakened. Furthermore, the extent to which note-taking maintains attention might also be disputed insofar as students take fewer notes as lectures proceed (Lloyd, 1968; Locke, 1977; Scerbo et al., 1992). The intensity of divided attention could well cause fatigue, particularly when noteworthy points are dense or the lecturer’s delivery is fast. It seems likely that note-taking maintains, and even improves, attention for a while; but thereafter the benefits may be small or even negative.

Activity 2.6 Implications of research for how you encourage your students to take notes

When you have read the extract, list what you think are the practical implications of the research evidence for your lecturing and your students’ note-taking:

1 What kind of note-taking do you want your students to do during your lectures?

2 How should you lecture in order to enable students to take such notes? For example, should you go slower, leave pauses, summarise and repeat points, use more visual information, or what?

3 What do you want your students to do with their notes from your lectures afterwards? For example, should they be thoroughly worked over by ‘active questioning’, or just used as ‘memory joggers’ while reading?

4 What could you do to improve your students’ note-taking and their review of their notes? For example, should you give explicit advice, provide model notes to start off with, or have a discussion about the purpose of note-taking?

Conclusion

This part asked four questions and, at the risk of over-simplifying, the answers are summarised here.

1 When should you be lecturing?

Bligh would argue: ‘Possibly less than you are doing at the moment’. If you wish to convey factual information you are as justified in choosing lectures as you would be in choosing a range of other methods. If you wish students to understand and solve problems or if you want to inspire them or change their attitudes, then lectures, on their own, may not be the best choice.

2 How do students experience lectures?

Hodgson describes students as hoping to be interested or inspired and as looking for relevance, but how they respond depends on their orientation. Some are narrowly focused on meeting assessment demands and expect lectures to help them in this goal. Others are looking for personal or career relevance and pay attention accordingly. Some can be carried along by an enthusiastic lecturer and experience ‘vicarious relevance’.

3 Can student feedback help us to improve our lectures?

Almost certainly yes. Students are surprisingly reliable and valid judges of teaching and can discriminate those aspects of lecturer behaviour which have been shown to make a difference to how much students learn. Student feedback ratings, at least using properly designed questionnaires,
do relate to learning outcomes. If you pay attention to this feedback, and especially if you get help in interpreting it and deciding what to do about it, it is likely to improve your feedback ratings and also to improve your students’ learning.

4 What kind of note-taking is going on in your lectures?

Almost every kind you can imagine, as students vary a good deal. But often note-taking is neither accurate, thorough nor productive, and notes are often not used, or useful, afterwards. Note-taking usually aids attention, improves students’ recall of factual information and, when it involves active summarising, can improve understanding. Student review of notes during lectures, as well as afterwards, helps to enhance the benefits of note-taking, though neither is particularly common. Clear structuring and sign-posting of what should be recorded helps students a good deal. Students gradually get better at note-taking, and advice and training can help accelerate their ability to be able to take and use notes effectively. However, lecturers can cause problems for students, for example by going too fast to allow thoughtful note-taking, by failing to distinguish key points from background information, and by failing to give time for review and summarising.

The appendices to this part provide suggested activities that help you to move from a focus on content to a consideration of process – in your context. Practical hints and ideas relate to the core elements of lecturing practice: preparing and organising lectures, structuring material so that it is understandable, making learning in lectures active, and achieving rapport during lectures.

We suggest that you will want to dip into these appendices as and when you would like to explore specific aspects of your teaching. You may return to a particular section several times, as you discover more about what is going on in your lectures and as you gain the confidence to experiment. There are many practical suggestions here and you are not expected to try them all.

As with all the materials in this series, reflective exercises and activities are designed to illustrate the meaning and significance of ideas in the part, linking the concepts and theories to what you actually do as a lecturer. Activities will ask you to draw on the lecturing you are doing, or may involve finding out more about the context in which you lecture. You may find that engaging with the suggested activities will provide an ideal focus for discussion with a mentor or colleague about your teaching. If you are collecting a portfolio for accreditation, some of these activities will provide evidence you can use in support of any claim about your abilities.

Because planning lectures is often the central part of course planning, I have included in these appendices some fairly generic material, for example in relation to course aims, study activities and handouts. But this material applies equally to planning for other teaching methods such as those dealt with in Part 1, Teaching in Groups.

Appendix 2.1 helps you think through planning – before the lecture: this section is concerned with clarifying the purpose of your lectures within a course, with preparing your lectures and with the first lecture of a course.
Appendix 2.2 concerns the actual process of lecturing: this section helps with introducing and structuring your lectures, using visual aids, asking and answering questions and concluding your lectures.

Appendix 2.3 is about enhancing lectures: how to encourage active learning, improve your students' note-taking, and handle problems which may arise during your lectures.

Further reading


This recently greatly expanded book is a classic, first published in 1971. It has a substantial research base but a practical focus. After considering the effectiveness of lectures compared with other methods it considers factors influencing student memory and attention, student motivation and note-taking and the evaluation of lecturing.


George Brown identifies different styles of lecturing and analyses explanations in detail, drawing on examples.


A short and practical 37-page manual concentrating on the challenges and techniques associated with especially large lecture classes.


Fifty-three practical ideas, each presented in a ‘take it or leave it’ way which makes it easy to dip in to. The ideas on active learning in lectures are more radical than are usually encountered in texts on lecturing.


In this American best-seller advice is backed up by a huge research literature, but in a down to earth and readable style. Many of the big educational development names in US higher education have contributed chapters. It covers many other topics as well as lecturing.


This concise and practical guide covers all the main types of audio-visual equipment and gives technical as well as educational advice on their use.

www.umist.ac.uk/apt/

A useful website concerned with using presentation technology and presentation software such as Microsoft PowerPoint®. It also contains advice on tutorials.
References


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Acknowledgements

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Appendix 2.1 Before the lecture

Some of the most important elements of good lecturing are sorted out long before the lecture itself takes place. This section considers the different purposes of lectures, how to prepare a lecture and how to plan the first lecture of a course.

What is the lecture for?

Teachers use lectures for a wide variety of reasons and this affects the kind of lecture they prepare and how they present it. When you are planning a lecture it is important for you to be clear what it is for.

Reflection 2.7 What are the purposes of your lectures?

Think of a particular lecture you have given or are about to give. Which of the following best describes the purposes of this lecture? You may have several purposes, including some that I have not listed.

- Providing the course content
- Explaining an idea
- Briefing about the area to be studied
- Modelling a form of analysis
- Providing a reading guide
- Providing inspiration.

It could be interesting to show this list to an experienced colleague and to ask them which purposes they emphasise in their lectures. I have elaborated each of these purposes below.

Providing the course content

Your lectures may be the primary source of course content for the students – perhaps because there are no suitable textbooks, or because the sources that do exist are too difficult and diverse for students to find and use. In these circumstances the quality and thoroughness of the notes students take during your lecture will be very important to them. You may also want to provide the course content because it is not available in print, for example when it is at the cutting edge and not yet published.

Explaining an idea

There may be ideas, theories, approaches or techniques that you know are difficult but which are absolutely central to your course. These may require particularly clear explanations, demonstrations or examples if students are to understand them. Oral presentations can have advantages over texts: they can allow scope for greater ‘redundancy’ and repetition in explanations and provide greater flexibility in responding to students’ difficulties, questions and interests. They also allow you to check for understanding before progressing.
Briefing about the area to be studied

Your lecture may represent the tip of the iceberg, in terms of what students will need to study. Your aim may be to give a clear outline picture of the entire iceberg, so that students go on to study the whole of it, including the parts that you are not able to bring into view during your lecture.

Modelling a form of analysis

You may be concerned less with content than with process, for example, by modelling the analysis of a legal case or solving an engineering problem out loud. The aim may be to reveal the form of the analysis or the nature of the skill involved, so that students can apply these to case material or problems you provide later. Such live analysis can help induct students into the discourse of your discipline and thus begin to learn to think as, for example, a lawyer or engineer thinks.

Providing a reading guide

Students used to be told that they were ‘reading for a degree’. You may expect the real learning to take place in the extensive reading that students do after your lectures, but the reading material may be complex and difficult. Your lecture may act as a guidebook to a strange country. The aim may be to make students familiar with the language and the landmarks, so that they can find their way without getting hopelessly lost and confused. Annotated reading lists, glossaries and overviews can be useful in such lectures.

Providing inspiration

You may have a sense that the view from the top is wonderful even though the foothills may be hard work, and that what students need is a vision that will keep them striving upwards. Seeing an Olympic athlete compete will not teach you how to run fast, but might inspire you to train a little harder. Similarly, a historian’s ‘view from the top’ cannot on its own teach students how to be historians (though it may model how the discourse of history operates). However, it might encourage students to read with more eagerness and purpose. Your aim may be primarily to motivate rather than to provide specific content or learning.

Briefing students about your purposes

It can be helpful to your students if you explain to them what your purposes are and what they should therefore be doing in your lecture. For example, you might begin by saying:

The most important idea today is Christaller’s Central Place Theory. You need to understand this theory and the way we use it to explain various phenomena – and I will give lots of examples of the way this theory is applied. But you don’t need to remember the examples so you don’t need to take much in the way of notes – just listen and think and please ask questions.
Preparing a lecture

Background work

Do you decide on your lecture topics? Did you choose to use lectures, rather than project work or other methods? Did you design the content and form of your course or write the exam towards which your lecture builds? Did you contribute to the design of the degree or other programme into which your course fits?

For many teachers in higher education, the answer to all these questions is no. You therefore need to find out who made these decisions and why; otherwise your lectures will not fit well into the overall scheme of the course, or make sense to your students. Course lectures are not isolated events. They fit into and contribute to a context.

- Get hold of formal documentation about the course or module. Are there specified objectives or learning outcomes? Do they map onto each week of the course, rather than just listing a syllabus? Find out about the rationale or philosophy underpinning the course. Why is it being offered? How does it relate to other courses students might take?

- Find out what students do on the course other than attend your lectures. Do they attend seminars or problem classes or undertake practical work? Try to get a sense of the way students use the content of your lecture in other parts of the course.

- Borrow notes from the lecturer who taught the same class last year and, if you have the chance, talk to them about what they did, why, what worked well and what didn't.

- Look at the way content is covered in the textbook students use on the course.

- Look at last year's exam questions, essay titles or problem sheets to see what students are expected to be able to do with the content of your lectures.

- Find out if there are any prerequisite courses and what courses students are likely to have taken before they come to your lectures. This will also show what they are already likely to know and be able to do.

- Find out what courses your students go on to, especially those that build on what you are teaching and which rely on students knowing, understanding and being able to do certain things which your course is supposed already to have taught.

If you can, plan lectures in a series, rather than in isolation, so that each is connected logically and builds on to what went before.
Setting up learning activity

Your lecture will be only one component of your students’ learning and they will probably spend two to four hours out of class for every hour in class. Your lecture has to set them up for this independent learning. The most common ways to structure such learning activity are reading lists and problem sheets. These need to be designed at the same time as your lecture, so that they make a coherent package.

Reading lists

If there already is a reading list, look at the recommended texts and articles and plan your lecture to prepare students to undertake this reading. If there is no detailed reading list then create one. In reading lists it is helpful to distinguish between:

- *Introductory material* which will help students with no background in the topic to get going and which they might read *before* your lecture. Don’t be afraid to suggest *very* basic material if the range of backgrounds of your students is wide.

- *Key material* which backs up your lecture and which you would expect everybody to read. You will need to use a textbook that all students possess, or check that the library has multiple copies, or provide copyright-cleared material for all your students. Do not recommend key material which students cannot easily get hold of.

- *Advanced material* related to specific sub-topics which some students might read out of interest or because they have an assignment in these areas.

Help students by identifying relevant chapters and sections rather than listing whole books, and suggest alternatives so that they will not be stuck if the key text is on loan. Being unfamiliar with the area and the language, they will read very much slower than you – perhaps only a quarter as fast. If they are full-time students and are studying four courses in parallel then they will have about 10 hours a week on your course, including both classes and study time, so you can estimate how much reading they can reasonably manage and then make your expectations explicit:

I have constructed a reading list to guide the seven hours a week you have out of class. I expect everyone to read *all* of the required material, which is marked with an ‘R’, and to spend about two hours a week with supplementary material of your choice from the items marked with an ‘S’. This material will help you prepare for your seminar presentations and essays. Given the level of difficulty of material involved I estimate that you should be reading about 100 pages per week.

Problem sheets

If problem sheets already exist then your lectures should be designed to prepare students to tackle them, rather than simply covering material in the same general area as the problems. Use the same notation and forms of explanation and presentation as the problem sheets. If you have to prepare your own problem sheets, bear the following points in mind.
• Have a look at the exam paper (or a past exam paper) to see what the problem sheets should be preparing students to tackle.

• Sequence the problems logically, either following the same structure as your lecture or starting simply so as to build confidence. Make them progressively more complex or open-ended, integrating more elements together as students work through the problems.

• Offer written explanations or prompts to early problems to help students to get started.

• Provide a model solution to the first problem of each new section of increasing difficulty or complexity.

• Provide a small number of advanced problems to challenge the most able students, and identify them as advanced problems.

• Provide detailed references to textbooks at key points so that students can make progress on their own if they are stuck.

Deciding what to put in the lecture

A common mistake made by new teachers is to over-fill their lectures out of anxiety about how it might be perceived if anything is missed out. You should not be trying to present as much information as possible but trying to develop the way students think and understand. Concentrate on conveying a few key points and provide examples to illustrate the meaning and significance of these. When you are planning, instead of listing all the things to cover, start by roughly sketching out possible outlines. Map out the overall structure of the lecture in the way you might outline an article or essay. Then trim and shape this structure, concentrating on logic and sequence, and adding examples and illustrations. Resist the temptation to add too much detail or supplementary points that might detract from the main messages. It is the overall structure and the prominence of the key points that will give your lecture its force as teaching.

For example, in writing about preparing a lecture, it may be more important for me to convey the main headings of this section than any specific point I might want to include. If you have to check to see what these main headings are then I have probably over-done the level of detail and lost sight of the main points.

Lecture plans

When you are lecturing you have to manage the time, manage what your students are doing and manage how you interact with them, as well as presenting a well-structured content. When you are planning lectures, you need to select and structure the content and also plan the timings, and learning activities involved, and the resources you will use. Selecting the content of the lecture is considered briefly above and structuring the content is considered in more detail in Appendix 2.2. Here I consider the lecture from the point of view of what students will be doing during the roughly 55 minutes that the lecture lasts.
Activity 2.7 Planning your lecturing time

The line below represents the 55 minutes you will have for a lecture. Assuming you wanted to cover three main topics or subjects, at what point would you start and complete each section of the lecture? Is this balance of time appropriate? At what point will students' attention start to flag?

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<tr>
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<th>15</th>
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</table>

Figure 2.1 represents a rather general lecture plan that spreads the three topics of a lecture across 55 minutes and also introduces two short breaks at points where attention might flag. The three topics have been allocated roughly the same amount of time each (11, 13 and 11 minutes respectively): 35 minutes in all for the main content of the lecture.

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<th>45</th>
<th>50</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Introduction</td>
<td>Topic 1</td>
<td>Break for questions</td>
<td>Topic 2</td>
<td>Break for questions</td>
<td>Topic 3</td>
<td>Summary and questions</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Figure 2.1 Time plan for a lecture covering three main topics

Lectures should require students to do things – listen, take notes, read handouts, tackle short tasks – and they should also prepare students for doing things afterwards. To make sure students do these things you may need materials to help you such as overhead projector (OHP) transparencies or slides, and handouts that support the lecture and the subsequent learning activity.

Figure 2.2 shows a much more comprehensive plan. This level of detail is not necessary for every lecture, but going into this level of detail once or twice would help you to think about the overall structure of your lecture session in terms of its processes and time management. You would probably then find yourself doing this kind of planning automatically, without having to write it down in detail. The figure features a lecture plan which is not just a list of topics but also an account of what students are doing, what is expected of them beforehand, what is expected of them afterwards, and the resources they will need.

The topic of this lecture is ‘How students learn’, and students are expected to interview each other about how they learn both before and after the lecture. Guidance on these interviews is provided in a handout that needs to be distributed a week beforehand, printed the week before that and probably written three weeks before that. This kind of integrated approach to preparing lectures in relation to students’ activities and use of learning resources cannot be undertaken the night before the lecture.
### Figure 2.2  Detailed lecture plan showing what students are doing and the resources required

<table>
<thead>
<tr>
<th>Section and time</th>
<th>Topic</th>
<th>Student activity</th>
<th>Student preparation</th>
<th>Resources during lecture</th>
<th>Student follow-up activity</th>
<th>Resources for follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 4 mins</td>
<td>Review of last week Introduction</td>
<td>Look at last week's notes. Listen</td>
<td>Read Chapter 5 of textbook and handout</td>
<td>Last week's handout</td>
<td>none</td>
<td>---</td>
</tr>
<tr>
<td>2 10 mins</td>
<td>1: Approach to learning</td>
<td>Listen, take notes</td>
<td>None</td>
<td>OHP 1 OHP 2</td>
<td>Reading</td>
<td>Reader Chapter 6 Article 2</td>
</tr>
<tr>
<td>3 3 mins</td>
<td>Categorize two transcript extracts as</td>
<td>Interview two first year students about their approach</td>
<td>Students' own interview transcripts</td>
<td>Interview two third year students about their approach</td>
<td>Section of handout with interview questions</td>
<td></td>
</tr>
<tr>
<td>4 12 mins</td>
<td>2: Learning outcomes</td>
<td>Listen, annotate handout</td>
<td>None</td>
<td>OHP 3 OHP 4 OHP 5 Handout</td>
<td>Reading</td>
<td>Reader Chapter 6 Article 3</td>
</tr>
<tr>
<td>5 6 mins</td>
<td>Categorize two examples of outcomes. Discuss in pairs</td>
<td>None</td>
<td>Examples of outcome in handout</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>6 14 mins</td>
<td>3: The effect of approach on outcome</td>
<td>Listen Take notes</td>
<td>OHP 6 OHP 7 OHP 8 OHP 9</td>
<td>Read Interview two students about why they take the approach they do</td>
<td>References on handout Interview questions on handout</td>
<td></td>
</tr>
<tr>
<td>7 6 mins</td>
<td>Summary. Briefing for reading and interviewing</td>
<td>None</td>
<td>OHP 10 Handout</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>
Activity 2.8  Planning a lecture in detail

Draw up a plan for a lecture you are going to give, using the same framework as Figure 2.2. Add as much detail as you can about sections and sub-sections, timings, the resources you will use and so on, until you have a comprehensive account of everything that will take place. Then start stripping out the detail until the plan contains just sufficient information for you to use it as a prop during the lecture.

Lecture notes

While you are lecturing you will need notes or other aids because you won't be able to memorise the entire lecture. Preparing these aids is, in effect, preparing the lecture. How much detail to go into may depend as much on your level of anxiety as on the complexity of your lecture. There is no standard approach – each lecturer eventually settles on what works best for him or her.

Overhead projector transparencies

My personal preference is to lecture from overhead projector transparencies. I make a paper copy of each transparency and add handwritten notes. I hold these paper copies in my hand while talking. I can skim through the paper copies faster and easier than skimming through the transparencies themselves when I need to look ahead to see what I am supposed to be talking about next. I find I do not read many of my own notes during the lecture – I don't have time, especially when I am concentrating on holding attention and keeping eye contact with the audience. However, a quick glance reminds me of the main headings on the transparency, and the act of making the detailed notes beforehand is useful in rehearsing what I am likely to say. I don't keep closely to my notes, and having clear headings on the transparencies brings me back on track when I have improvised a little.

An additional advantage of using transparencies as your lecture notes is that they share the structure of your lecture with the students – they can see exactly where you are in your argument. And because you cannot write a great deal on each transparency, you are forced to summarise the key points and students can distinguish these from the details.

Recently I have started using computer presentation software to produce transparencies and this enables me to print four or six transparencies per page as lecture notes. Three such pages might be sufficient for the entire lecture and are very convenient to hold in my hand. They also limit the number of additional notes I can scribble, which for me is a good thing. I can then use exactly the same sheets, containing all my transparencies, as a handout for the audience.

Alternative approaches include making a full transcript, using cue cards or outline notes, and using notes made by other lecturers.

Full transcript

Some lecturers write out the entire text of their lecture in longhand as this helps to create a feeling of familiarity and completeness which gives confidence. I have never done this and I would find a full transcript impossible to use during a lecture. I would not want to read it out verbatim, and I'm pretty sure that my audience would not want me to do
so either. It is difficult to see the structure and main points amid continuous prose, and if you departed from the script you would have trouble getting back on track. This results in keeping excessively closely to the script, which can make the delivery lifeless. In any case it would be much quicker for your students to read your transcript than for you to read it out to them.

A full transcript can, however, give an indication of how long the lecture will take to deliver. Lecture delivery should not be faster than about 120 words per minute, or 7,200 words without a pause in an hour. As you do need to have breaks (as in the lecture plan in Figure 2.1), a reasonable limit is about 6,000 words.

**Cue cards**

Some lecturers summarise the key points in each section of their lecture on an index card. The entire lecture might be summarised on 10–20 such cards. They are easy to hold in your hand and contain sufficiently little text that they can be read at a glance during the lecture.

**Outline notes**

Outline notes may contain main points and display the structure – a skeleton – but contain few or no details (this is similar to using overhead projector transparencies as an overview). This may be all that is needed to remind an experienced lecturer of the sequence in which familiar content is explained, particularly if the lecture is structured around a few key points, experiments or studies. Detailed back-up can be provided in the handouts given to students. When I am lecturing I often refer to a handout I have given the audience, so that they are looking at the same thing as me while I am talking. Preparing handouts, in this sense, is part of preparing the lecture.

**Using other people's notes**

You may be provided with a set of lecture notes written by another lecturer. I would find such notes very helpful in planning my own lecture but impossible to use without further work. I would need to personalise them – using my language, my headings and emphasis, and possibly adding notes in my handwriting.

**Preparing handouts for students**

Students greatly appreciate handouts, which help them to learn by:

- reducing the demands of note-taking, so that students can concentrate on making sense of the lecture;
- providing a full and accurate record of crucial information such as diagrams, formulae and data, which students tend to either miss or record incompletely;
- providing material (such as in the above lecture plan) which can be used as the basis of short activities during the lecture;
- giving guidance and references to support reading and other learning activities after the lecture.

An alternative to designing and printing handouts is to make your lecture notes and transparencies available to students electronically or in hard copy from the departmental office. Some departments make all such material available to students electronically.
The first lecture of a course

The first lecture is usually your first meeting with the students on the course. What are the implications of this?

**Reflection 2.8 What do students want to know?**

Think back to your own experience of attending the first lecture of a course. What did you want to know?

- About your lecturer and whether he or she was interesting?
- About the whole course and the sequence of lectures and topics involved?
- About what work was expected alongside the lectures?
- About the assessment at the end?

Make some notes about what it might be useful for your students to know about at the very beginning of a course.

How could you provide this information in a quick, interesting and attention-grabbing way?

You may need to use much of the first lecture to explain the course and how it works and to establish how students will work on the course. More than any other lecture, it should be about process as well as content. There are several areas that you might usefully address.

**Social matters**

If the students have not encountered you before, introduce yourself: who you are, your academic interests, and what your experience consists of. If a team of teachers is involved, introduce them all – or at least run through their names and what their roles are. Do this even if most of the students are familiar and there are only a few new faces; otherwise, the new students will be disadvantaged from the start.

**About the group**

If the students have not been together as a group before it may be helpful for them to understand the make-up of the group:

- How many of you took course X last semester? How many are going on to Y?
- Who is taking this course as an option? And as their first course in geology?

**Establishing patterns of interaction**

If you want interaction in the lecture then get some going in the first few minutes, to establish the tone and the expectation that discussion and activity are encouraged:

- Please take three minutes to introduce yourselves to the people either side and in front and behind. Make sure the others know at least your name.
You can make this introduction impersonal and pragmatic:

Find out who is in the same lab group as you.

or personal:

Find out where the others live and discover one interest in common.

Once students have spoken once to each other they are much more likely to do so again when you want to use short co-operative tasks or to ask questions.

Course aims

Explain the aims of the course:

This course is about methods used in sedimentology. You will use these methods in other courses, both during this semester and later. You have to be able to use all these methods safely, quickly and efficiently.

One way to explain aims is to outline what counts as success in assessment:

The assessment is entirely practical: reports from the laboratory sessions and a practical exam in which you will be asked to use several methods and pieces of equipment under exam conditions, in the lab, without help. You will be assessed on how many of the practical tasks you get through and how accurate and full your reports are on what you have measured, identified and found out.

Assessment

This is what students most want to know about: how many assignments there are, what they consist of, deadlines, and issues which affect how selective they can afford to be in covering all the content of the course:

You will be asked to write up six of the eight lab sessions and two of your reports will be assessed, each contributing 20% of the marks. You won't be told which ones you will have to write up until after the session, or which will count for marks until after the deadline for submission, so you will have to take them all equally seriously. This is important because you need to be able to use all the techniques in subsequent courses. Cutting any corners would be very risky. The deadlines for submission are in the assessment handout. The exam is a three-hour lab exam in week 12 when you will be given an hour for each of three tasks using equipment to study sediment samples. You will have had practice with all the possible techniques and nothing in the exam will come as a surprise.

Information like this should be presented visually (on a projector or in a handout) as well as orally, or it will wash over students' heads. You are likely to need to spend several minutes answering questions and making sure everyone understands how assessment works and why it takes the form it does.
Content
Introduce the topics the course tackles and briefly explain why they have been chosen and ordered as they have:

We start by introducing the equipment you will use, such as the geological microscope (just like the one I'm demonstrating here) then their application to different types of evidence, such as recognition of microfossils and crystals (such as the ones shown here). Finally we confront you with a range of interlocking evidence of the kind you might collect on a field trip, which you need to interpret using the equipment and techniques.

Locating the course
Explain how the course relates to other courses:

You will have learned about how sediments are laid down on course 101. Here you will be learning to identify and interpret sediments by using a variety of techniques and equipment. It will enable you to undertake fieldwork on course 301 next semester.

Teaching methods and student work
Explain the role of lectures in the course:

The lectures provide technical background and briefings for the practical work and also provide examples of the use of the techniques you will encounter – for example I'll show you seismic records and explain how to interpret them before you have to do this for yourself. The content of the lectures will not be examined except through your ability to use and apply the techniques in the lab.

Explain about the relationship of your lectures to other elements of the course and their sequence:

Each week the lecture comes first, then the practical session, then writing up the practical. I'll also use lectures to debrief you on points that arise after the previous week's practical.

Expectations
Explain what you expect of the students and how you want them to behave:

I expect you to attend all of the lectures because that is where I will show you examples of what you will be seeing in the labs, and how to recognise and analyse what you will see. I'll expect you to have read the section of the textbook before the lecture and will ask some of you each week to analyse the slides I'll show – which you will not be able to do if you have not read the textbook. I'll expect questions and I'll ask questions and set short group tasks at various points during lectures. We have plenty to get through, so please do not turn up late and delay the start for your colleagues.
Resources

Explain about the resources available to students to support them on the course:

We will be using the following textbook ... You need your own copy or you will not be able to prepare for the lectures. In addition, I'll provide a weekly list of additional reading, including some journal articles so that you can see the techniques you will be learning about being used in up-to-date research. All the material on my list will be in the reserve collection in the library for reference use only. Handouts will be provided each week. The course guide gives the file address for the electronic copy of the handouts. Don't ask me for a second copy: print your own. There is a library of slides and samples next to the main lab and you can study them with the microscopes or slide projectors at any time. The technician will log out material and help you to use the equipment.

Study time

Explain how much time students are expected to work on the course and what you expect them to do with this time:

This is a 15 credit course and that means about a quarter of your time for the semester – 10 hours a week. There is one lecture and one three-hour lab so that leaves six hours a week for studying. I expect one hour a week preparation from the textbook before each lecture and one hour a week with the lecture notes and other readings preparing for the lab. It will take you two to four hours to write up the lab reports – some are much bigger than others. There is no lecture or lab after week 10 so you have two weeks solid for revision: 16 to 20 hours.

Students and lectures

Explain what you expect students to be doing during your lectures, what note-taking you think will be useful and, if you are using handouts, what students are expected to do with them:

I'll provide handouts containing all the diagrams and visual information, to save you having to draw it, but you will need to annotate these diagrams as I explain about them. You will need to use your handouts to guide your practical work in the lab, so make sure your annotations are full and readable, and bring them with you to labs.

Hand out your course guide and refer to it throughout your first lecture so that students get used to looking things up and finding what they need. If students ask questions about the course, refer them to the guide whenever possible.

Students get impatient if there is no subject content at all in the first lecture, so use it to summarise the course: how the topics link together, what the big organising principles and ideas are, what the key terms you will use are, and so on, using concrete examples so that students can see what you mean. In the first lecture it is often best to give an overview rather than try to explain the first topic.
Appendix 2.2  During the lecture

Introducing a lecture

Students have often come into your lecture straight from another lecture or session, or have been chatting over coffee about something entirely unconnected with what you will be talking about. It may be noisy and seem a little chaotic as they settle down and late arrivals roll in. You, on the other hand, will have been preparing and thinking about little else and are ready to go. The main challenge facing you at the start is to attune the students and get them up to speed so that you can progress together at the same pace. If you set off too soon or too quickly then you will leave them behind. Students can be ‘tuned in’ in a variety of ways.

State the topic

You can display a transparency stating the topic, and perhaps the structure and aims of your session, as soon as you arrive. You can leave it on display for several minutes as the students get out their notes and remind themselves where they are and what they are doing in your session. While the title is displayed and things are settling down you can talk to individual students, hand work back or give out handouts.

Grab their attention

Don’t start the lecture until the students are attentive and ready and there is no distracting chat. All that may be necessary is saying ‘Right, let’s get going’ loudly and decisively, displaying a new image on the overhead projector and waiting 10 seconds.

Reviewing

You can start gently by reminding the students what you tackled last week. This will bring to consciousness the language and ideas you use and which this lecture may build on:

If you remember from your notes last week we looked at the following ideas that we will be exploring further today ...

You can make this an active process by asking several students questions about the previous week.

Advance organisers

Students find it enormously helpful if right at the start you give them a simple map of what you intend to tackle, so that they can make sense of what then follows. The London Underground map is sometimes given as an example of a simple conceptual overview of a complex area of information. Such advance organisers provide an organisational framework into which everything else fits. They can take the form of a diagram, a telling anecdote which encapsulates the central idea in a memorable way, the succinct statement of a theory or the kind of matrix explained in the section on structuring lectures. Displaying your structure for the lecture can provide the organiser they need.

A plan of the session

Appendix 2.1 contains examples of lecture plans in terms of the main things that will take place and how long they will take. Students like to
know if they are going to be writing silently for 55 minutes, so that they can pace themselves, or if they have something else to look forward to.

*Handouts and notes*

If you have expectations about how students use your handouts, and how they take notes, you ought to make this clear before they start. These preliminaries may take a total of five minutes before you are ready to accelerate into your lecture.

*Structuring a lecture*

How do you prevent the lecture from seeming like a dreary stream of unstructured prose? You give it form and make it understandable and memorable by giving it an explicit structure. Different kinds of structure suit different content and teachers also have their own preferences.

*Types of structure*

*Lists with headings and sub-headings*

These can highlight structure in an otherwise undifferentiated list and the headings themselves provide analytical frames, labelling and grouping detail. Students find it helpful if material is in chunks of no more than about five items, like this:

1. How do blind children develop?
   1.1 Motor development
   1.2 Perceptual development
   1.3 Cognitive development, etc.

2. How do deaf children develop?
   2.1 Motor development
   2.2 Perceptual development
   2.3 Cognitive development, etc.

Discursive lectures which appear to consist of simply a sequence of cases or illustrative examples often have a similar underlying structure, for example.

- Incident (or poem, or ...) A
  - Comment A1
  - Comment A2
- Incident (or poem, or ...) B
  - Comment B1
  - Comment B2
- A1 compared with B1
- A2 compared with B2
Logical sequences
Sequences can be built up through long chains of argument and the structure of the argument may need to be summarised at several points. In mathematics, for example, students can get lost half way through a twelve-line proof if the lecturer does not highlight the two or three heuristics involved. Students can perceive and remember the three heuristics much more easily than twelve separate steps. Additional steps may need to be built in so that the structure is signposted along the way:

So far, we have seen how X and Y tend to lead to Z, and that A and B tend to lead to C. Now we are going to combine these two insights in order to explore implications in a new context.

Case study or problem analysis
When students are presented with case studies they can easily get lost in the case details and lose sight of the process of analysis and the principles involved. You may need to make the process of analysis more explicit so that students pay attention to the right bits:

Now I’m going to analyse the second case. Let’s remind ourselves how I tackled the first one. First I analysed it. Then I considered three possible solutions and how I would choose between them. Then I selected a solution and justified this choice and finally I planned in more detail how it could be implemented. I’m going to repeat that sequence: analysing the case, generating solutions, deciding how to select which one to adopt, making my choice and then planning implementation.

A variation on the case/analysis structure is the modelling/debriefing structure. Here the lecturer performs an analysis, diagnosis, proof, interpretation or other skilful procedure in front of the students, in order to model how it is done, and then takes the performance apart:

If you remember this is what I did first, then I had to do a little of this and a little of that because ... then I finished by .... You can see that this involves the following four stages ...

Again, there may be several such modelling/debriefing sequences so that students become skilled at spotting the underlying structure in several contexts.

Matrix or table
Material may be organised along two dimensions. A lecture using the underlying structure of Table 2.1 might be sequenced in the following way:

1 Outline of three methods
2 Issues in choosing methods
3 Method 1, pros, cons and uses
4 Method 2, pros, cons and uses
5 Method 3, pros, cons and uses
6 Example of selecting a method for a particular context.
It is the table that gives the structure to the lecture, and it might be displayed throughout the lecture or be provided as a handout. Once the structure of the table has been established the structure of the lecture can be much freer – for example gradually filling in cells in any sequence from examples or by asking questions of the students.

**Table 2.1 Content and structure of a lecture**

<table>
<thead>
<tr>
<th>Method</th>
<th>Pros</th>
<th>Cons</th>
<th>Common uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Networks**

Knowledge is not always easy to list or put in tidy tables or sequences. But it may still have a loose structure that it is helpful for students to see. Various graphical forms can be used to show links between different components of the content. The example in Figure 2.3 portrays one way of conceptualisation, a ‘concept map’, and is drawn from Donald Bligh’s book *What’s the Use of Lectures?* (see Further Reading).

If such a visual representation of the structure of a topic is displayed to students it leaves the lecturer free to start almost anywhere and to show the links between different parts of the topic. Points raised by students can also be located within the structure. It is important for students to recognise that such networks represent only one way of representing the topic area and that there is an infinite number of possible structures.

**Introducing and explaining the structure**

Showing students the structure of your lecture allows them to anticipate what comes next, link forwards and backwards in their minds while attending, and take notes which themselves have more structure. It can be worth making your structure explicit right from the start.

- Display the contents list (or matrix or diagram) visually, and then talk your audience through it:

  Today my lecture is in four sections, each contrasting two different approaches. I'll be spending about five minutes on each of these eight sections. I'll start with an introduction to the topic and to the two approaches, and finish with a review and a personal perspective on these two approaches.

- Explain why the lecture is structured this way and how the components link together:

  You will need to choose between these approaches when tackling problems and questions of the kind I'll be looking at today. I have structured the lecture so as to contrast the implications of adopting these two approaches. Each section of the lecture illustrates the two approaches side by side. The four sections are in no particular order – they are just different kinds of problems to illustrate where the approaches can be useful.
Figure 2.3  Tree diagram or ‘concept map’

- Suggest how the structure might be helpful as students think about the lecture:

You might find it helpful, as I work through the four sections, to make notes which contrast the way the two approaches can be applied – advantages and disadvantages, that kind of thing. If you divide your notes into two columns you will be left with two lists of points, one for each approach, and that could be a good way to summarise the lecture.

Students may experience such explicit structures as over-prescriptive, and they may limit your spontaneity as a lecturer, especially if the frameworks are elaborate. The key may be to keep the structures elegantly simple and clear.

Some lecturers like to ambush audiences with unexpected twists and turns, and deliberately conceal the structure in case it spoils the drama of the lecture. This may add to the performance and make it more memorable, but may also leave students with little in the way of a framework to organise their own thoughts and notes.

While the way your lecture fits into your structure may be obvious to you, students often get lost. They miss transitions from one section to another, muddle points which fit in one section with those in another, and often end up with notes which look more like a stream of consciousness than a neat argument. You can help them by repeatedly displaying the overall structure and reminding them exactly where you are, at each transition from one section to another:
Pack 5  Ways of Teaching

So I have just finished looking at the way students approach learning tasks and what the approaches consist of. I'm now going to move on to looking at learning outcomes and how approach affects learning outcomes. Finally, as approach makes so much difference to outcomes I'll look at what is known about what causes students to take ineffective approaches.

If you are using handouts, it can be helpful if they have the same structure and headings as your lecture. If you are using gapped or incomplete handouts the structure can be made to look visually very similar to the way you display it so that students can add their own notes in the right place.

Activity 2.9  Mapping your lectures differently

1. Take a lecture you have already given and map out its structure in the form of a transparency you could use to explain it to students.

2. See if you can take the same content area and, using one of the structures above, reshape it into an entirely different form. What would the advantages and disadvantages of this new structure be compared with what you have done before?

The advantages of structuring your lecture around a tree diagram rather than a linear plan, for example, might have been:

1. you could have used case material or anecdotes at the outset and analysed them in relation to any or all these boxes, without being tied to the linear sequence;

2. your audience would have been able to see the 'big picture' at the start instead of having to wait 40 minutes to get there.

The disadvantages might have been:

1. the individual ideas might tend to be explained less clearly;

2. the overall structure might prove complicated to take in, though it would not be necessary to do so all in one go.

Using visual aids

Although you have probably experienced excellent lectures that consisted of oral monologues, evaluation feedback makes it clear that students greatly value effective use of visual aids, and for sound reasons. Some students learn best visually, and visual and auditory messages simultaneously have been shown to lead to better comprehension and retention. Visual representation of ideas can also help students to develop mental structures. I understand Kolb's experiential learning theory, for example, in terms of a mental image of a diagram. Some topics are hard to convey with any clarity without visual representation.
Using AV aids can help your lecturing by:

- displaying a number of points simultaneously to show the structure of an argument, patterns in data, overviews and summaries, in a way which is difficult in sequential speech;
- making abstract ideas concrete, through pictures, diagrams, graphs and other graphical representations;
- highlighting key terms, ideas or conclusions which you want to stand out from the background;
- bringing the outside world into the classroom, for example through photographic slides, videos or OHTs showing newspaper headlines;
- displaying raw data and data analysis methods and results;
- introducing and demonstrating computer-based resources (including the Internet);
- controlling students' attention, for example so that they are looking at the same thing you are looking at, or to influence their note-taking;
- providing the prompts and structure to your lecturing – as an alternative to lecture notes.

This brief introduction to visual aids concentrates on the use of the blackboard/whiteboard and OHP. Lecturers also use slide projectors and video frequently. Many more advanced uses of AV aids are possible. For example you can add a video camera to a geological microscope to show students in a lecture what only an individual could see down the microscope in a lab, and you can also demonstrate the use of computing methods. I do not have space to explore all the possibilities here. For more detailed and technical advice about a wider range of AV aids you are referred to O'Hagan (1997) (see Further Reading). Advice on linking OHTs to your lecture notes and to student handouts can be found in Appendix 2.1.

My advice when you start teaching is to keep it simple. While preparing student handouts and OHTs can be quick and can be seen as part of preparing a lecture, preparing other AV aids can be time consuming. During lectures AV aids can distract both you and your audience if they are used excessively or are too complicated to manage. AV equipment does break down and the more complicated it is the more likely it is that something will go wrong. Whatever teaching technology you intend to use, do rehearse. If at all possible, rehearse in the same setting and with the same equipment you will use for the lecture.

Blackboards and whiteboards

You can get students' attention by writing on a board, though it may be harder to hold attention if you continue to write for long. You can take students through an argument as it is built up on the board, as when presenting mathematical proofs, in a way that is different from students seeing the entire argument written down in a handout or on an OHT. You can also highlight key terms that you want students to take note of.

Writing on blank OHTs or a film roll on an OHP enables you to face your audience, and writing smaller enables you to write faster. Writing is also probably more legible on an OHT than on a blackboard: chalk often cannot be read from more than a few rows back, except on the cleanest and best lit boards.

When writing on a board you have to face away from your audience; if you speak while you are writing you may not be audible.
Do not use a board if you have a lot to write – it is much quicker to present an OHT prepared in advance and much easier for students if they have a handout containing what you would have written.

If you are going to use a board:

- clean the board thoroughly first: chalk is hard enough to read anyway and any text from a previous class will distract;
- use white chalk: colours are harder to read;
- keep the board uncluttered, using the space in an orderly way rather than working outwards from the spot in the middle that you happened to start from;
- check that students at the back can read what you are writing;
- check that students have taken notes from what you have written before rubbing it out.

Bear in mind that writing on a board involves moving your arm, not just your wrist, and that you will be writing a lot more slowly than you would on paper.

**Overhead projectors**

After boards, OHPs are now much the most common aid and are provided in almost all teaching rooms, unlike most other aids, for which you may need to make special arrangements. They are easy to prepare AV material for, and flexible in use. I never lecture without one.

- Check that the OHP works and set it up properly before you start your lecture. Align it so that the image on the screen is square and focus the top lens for a sharp image. You may have to move the projector closer or further away from the screen and adjust the angle of the screen. If it is not working the most likely cause is a blown bulb. Most OHPs carry a spare and some have a lever which changes the bulb for you. If you have yellow or blue colour fringing and uneven focus, then the lens sitting in the bottom of the projector also needs adjusting. Not all OHPs enable you to adjust this. You may have to clean the glass plate with a handkerchief. You may need to turn off any lights over the screen or close a curtain from a window next to the screen.
- Set up the table or desk so that you can stand or sit next to the OHP in order not to block students’ view of the screen and so that you can easily change slides and point to text on slides (rather than turning to the screen and away from the audience). You will need table space for your OHTs and notes and a non-permanent medium OHP pen to hand.
- Word-process your OHTs rather than handwriting them, as this makes them more readable, more easily adjustable to fit the space available, and easily changed and storable for future use.
- Keep the size of your lettering large: 24 point is usually recommended as a minimum, with 36 point headings (see Figure 2.4).

*Figure 2.4  A range of font sizes*

10pt 12pt 14pt 16pt 18pt 24pt 30pt 36pt
Part 2  Lecturing

- There is a limit to how many readable rows of text it is possible to fit onto an OHT. You may have to reduce the amount of text on your slides to maintain the necessary font size.

- Ordinary 10 or 12 point type is completely impossible to read, even from the front row, once projected. This means that photocopies of articles and so on should not be used. Ordinary sized handwriting is also impossible to read.

- You may wish progressively to uncover an OHT so that students pay attention to one line of text at a time. Some students find this very frustrating and would rather the lecturer displayed the whole slide and simply pointed at the line being talked about.

- You can use overlays of several OHTs at once to build up a more complex picture and superimpose ideas.

- You can display an OHT summarising the structure of your lecture at each transition from one section to the next, to remind students (and yourself!) where you have got to.

- Turn the OHP off when you want students to listen to you rather than look at the screen; this also removes the noise of the cooling fan.

If you are anxious about how visible your slides will be, try them out when no one is there and go to the back of the room and check.

*Asking and answering questions during lectures*

**Asking questions**

In principle it should be easy simply to ask students whether they have understood. However, students are often reluctant to respond, not because they are being difficult or lazy but because it is a social situation with many risks and few incentives to speak out. A tacit rule has been established that the teacher will speak and others will remain silent and respectful. As a student, to speak implies taking a special status upon yourself without the agreement of your peers. The pressure is then on you to justify raising your status from passive nonentity to highly visible active participant. A solution is to lower the formality of the scene by asking simple, low-key informal questions and getting people to talk to each other first so as to break the tacit rule. Students may also need longer to formulate a question than they have time for. There are several ways to overcome these problems.

- Explain your expectation that students should join in and answer questions, and your intention to involve as many students as possible.

- Ask open-ended questions (which have a wide range of possible answers) rather than closed questions (which have a clearly right or wrong answer). Students tend to be reluctant to answer closed questions. For example ask:

  What possible explanations might we propose for what is going on here?

  rather than

  What is the correct explanation of this?
• Avoid questions of the ‘guess what I am thinking’ variety where students know you have something in mind but have no way of guessing what. Instead set questions in a clear context or provide possible options so that students can see what you are getting at, for example asking:

What would be the pros and cons of choosing a cross-sectional study to test this?

rather than:

How would you design a study to test this?

• Never ridicule an answer or embarrass a student, however silly their answer, or no one will take the risk of speaking up again.

• Leave plenty of time for students to answer – even short pauses can seem endless but counting to eight, slowly, can leave enough space.

• Turn a short or unrevealing answer into a short interview, to explore the response, provided this is not too threatening:

Tell me some more ...

What is your best guess ... and why?

or invite others to help out:

What can others add to that?

• Give all students a minute to try to write down an answer to your question on their own, before expecting anyone to speak in public:

Try tackling this question on your own - noting down at least three points. I'll ask someone to say what they have written down in about one minute.

The expectation that you will ask someone is usually enough to encourage students to take your task seriously even if the chance of any individual student being asked is low.

• Ask students to answer the question with each other in twos or threes and then ask one of the small groups to answer in public:

Please discuss possible answers to this question with those immediately next to you. I'll ask two groups to report what they have come up with in two minutes.

• Individuals who might not have spoken up before will have had the chance to work up an answer and check that it is not silly and may also feel that, as it is the group’s answer, it is less risky to report.

Almost all students are capable of attempting an answer, given time and a safe way of tackling the question.

This is particularly important for students from cultural or educational backgrounds which make it unlikely that they will speak up in public. Providing them with a safe opportunity to discover that they too can answer questions can be the best way to draw them into the pattern of communication you would like.
Answering questions

Ideally, students will be thinking actively throughout your lecture. You can encourage this by frequently asking them questions to test their understanding, to explore the connections between the content of your lecture and what they already know or have experienced, and so on. You can also support this thinking by encouraging them to ask questions. Not all lectures need question-and-answer sessions throughout. It is important to read the mood of the lecture. Switch to questions when you sense that attention is flagging, but press ahead when you can tell you are on a roll.

Unless you have established an informal and unthreatening atmosphere, and a pattern of easy interaction, questions are unlikely to be asked spontaneously and even the invitation ‘Has anyone got any questions?’ is unlikely to work. To elicit questions the same principles apply as with asking questions. A variety of strategies are offered here, one or two of which you might want to try in any particular lecture.

- Make your expectations clear:

  Please make a note of questions that occur to you as we go along, perhaps in the margin of your notes – things which puzzle or confuse you, or just intriguing questions. From time to time I’ll stop and attempt to answer several of these questions before moving on.

- Give students time to formulate questions, if necessary allowing time for individual or small-group work before expecting a question to be asked in public. Students can often get useful answers from their friends, given the opportunity, and if they can’t then they probably know they have a sensible question to ask in public.

- Take students’ questions seriously and treat their misunderstandings with respect. A dismissive reply will make it much less likely that anyone will ask a question again. The very first time you answer will be watched with great interest by students.

- Repeat students’ questions. Anyone sitting behind the questioner would not have been able to hear; and the question may not have been phrased clearly enough for you or others to understand what it was about:

  So the question you have asked is ...

  and then paraphrase the question clearly.

- Don’t bluff or cover up – if you don’t know, say so.

- Consider having a fixed slot for questions. If you have a large group and a full lecture and are worried that spontaneous questioning will get out of control and wreck your schedule and structure, offer fixed questioning slots – perhaps at the end of each section or after 20 and 40 minutes. It is precisely this need for strict social discipline, without which lecturing would be impossible, which makes it difficult for students to break out of the ‘trouble-making’ role to ask a question. Being explicit about such opportunities legitimates questions.
Encourage students to write down questions at the end of your lecture. You can collect these up, read them and prepare answers to present at the start of your next lecture. As well as revealing students’ misunderstandings and trains of thought you will show that their questions are shared by others and that you take their questions seriously. They will be more likely to ask questions in the future.

Concluding a lecture

Some lecturers just stop; others say ‘I’ll start again from this point next week’, and then leave. Students can find it helpful when lecturers tie up a lecture neatly by summarising the main points. Also, your lectures sit in the context of other student-learning activities, including other lectures. It can be helpful to brief students about what they are supposed to do afterwards with the content of the lecture, and to briefly stand back to set the particular lecture in the context of the course: to remind students of the ‘big picture’.

Summarise the main points

This could involve showing a transparency listing the structure of the lecture and giving a two-minute gloss on what has already been covered:

So what we have covered today is A, B and C. The main methods we have looked at are X, Y and Z. You have seen me use each of these methods and had a go at using one of them yourselves. The final comment I would like to make is ...

Briefing

You could say what you expect students to do with their study time before the next lecture (or problem class, seminar or lab) that uses or builds on the lecture, referring to the resources available to them:

The seminar topic this week is ... and it relates to the second half of this lecture. You should read at least the key readings listed in your handout, and attempt the activity relating to the first reading. I’d also like you to read at least one of the pieces listed in the supplementary list. I’ll ask everyone, at the start of the seminar, which of these supplementary pieces they have studied.

The big picture

You could make a few points which locate the lecture in the context of the course as a whole and link forward to the next lecture and the next section of the course:

So that concludes this second section of the course on how students study. Next week we start on the final section of the course, on course design. This builds on the learning theory we have examined today in that different models of course design are underpinned by different theories of student learning.
Students may also need to round off the lecture for themselves. You can structure the way they do this by:

- allowing them a couple of minutes to tidy and complete their notes and engage in quiet reflection, without discussion;
- allowing them a couple of minutes in twos or threes to help each other sort out gaps they may have in their notes or points they are not clear about;
- inviting and answering questions on outstanding points which they would like you to elaborate on;
- asking them to list what they think are the ‘three most important points’ from the lecture, or to write a ‘one-minute paper’ summarising the lecture. You can then either display or read out your own three points or summary. Collecting up a sample of these lists or summaries can be very revealing about what students are learning from your lectures.
Appendix 2.3  Enhancing lectures

Active learning in lectures

Listening to lectures can be a very passive experience and student attention can fall away markedly after about 15 or 20 minutes; you have probably experienced this yourself. However, students do not have to be passive during lectures – even in very large lectures. It is possible to support discussion, problem solving and small-scale group work quite easily. And such active learning can encourage thinking and engage students with material in ways that a continuous lecture struggles to achieve. After short periods of active learning students may also find that their level of attention recovers and they can make more productive use of the next period of listening. A break from listening helps, but an active task that makes very different mental demands can work better than a break. In a 55-minute lecture, it can be effective to build in at least two brief activities (as shown in Figure 2.5 below) in order to keep periods of listening shorter than 20 minutes.

Figure 2.5  Lecture plan showing student learning activities

<table>
<thead>
<tr>
<th>Lecturer activity</th>
<th>Lecture</th>
<th>Set task</th>
<th>Lecture</th>
<th>Set task</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student activity</td>
<td>Listen, take notes</td>
<td>Tackle task on own</td>
<td>Listen, take notes</td>
<td>Tackle task in pairs</td>
<td>Listen, take notes</td>
</tr>
<tr>
<td>Duration</td>
<td>12 mins</td>
<td>3 mins</td>
<td>18 mins</td>
<td>6 mins</td>
<td>16 mins</td>
</tr>
<tr>
<td>Total time</td>
<td>12 mins</td>
<td>15 mins</td>
<td>33 mins</td>
<td>39 mins</td>
<td>55 mins</td>
</tr>
</tbody>
</table>

Activities can involve:

- a problem or calculation, presented on a transparency, which requires students to use an idea or method the lecture has just presented;
- a poem, table of data or case study similar to one the lecture has just analysed, handed out to students for them to analyse;
- an open-ended question to discuss in pairs or threes;
- a review of the lecture so far, asking students to produce a two-sentence summary or a list of the three most important points so far.

The types of activity that work well during lectures have some of the following features:

- They are neither so easy that they are finished in seconds, nor so difficult that students have trouble getting started.
- They involve immediate use of material just covered.
- The task instructions are displayed so that students do not get confused about what they are supposed to be doing.
- Students are expecting to carry out activities, so they are already sitting in clusters ready to discuss a task, for example.
- Students are familiar with the type of activity, so they can get down to work with a minimum of delay; for example, the activity may be very similar to a problem you have just modelled how to tackle, on the board.
Students know that they may be asked to report on what they have concluded:

In four minutes I’ll ask a couple of groups to tell us their analysis of the data.

It is not necessary to ask every student or group to report – it would take too long and would be dull – and it may not be necessary to ask for any reports at all. It only needs an outside chance that students might be asked to report for them to take the activity seriously. If you listen in on a couple of groups while they are working, or look over the shoulder of a couple of individuals, you will see for yourself what students have done with the activity.

A mechanism for regaining control has been established. In a lecture with 100 students, 30 or so talking at once in small groups can be very noisy. You may need to alert students to your mechanism:

When the four minutes are up, I am going to turn the projector back on. When you see this, please help by asking those around you to stop talking so that we can get on quickly.

**Activity 2.10** Try inserting activities in your lecture

Devise two short activities that you could insert into a lecture you have to present. Exactly what would you ask students to do? How long would you give them? What resources might they need? What would you do to pull things back together at the end of the activity?

If students are really engaged they will be active while you are talking. Several suggestions have been made in other sections about how to foster such active learning – for example by using incomplete handouts or matrices which students complete as the lecture progresses. However, it is not easy to keep active listening going for extended periods and you may be obliged to stop lecturing and use short tasks if you do not want your students to become passive.

**Student note-taking during lectures**

Note-taking can help students to concentrate, to recognise what content is important, to see the structure of a lecture, and to remember the content of a lecture afterwards. The notes they take can also provide a good basis for additional learning and for revision.

However, while most students take notes, many also miss at least half of the points lecturers consider important. Many do not use their notes afterwards in ways which aid learning, sometimes because they are not very useful notes. There is clearly scope for improving the way students take notes and extending the use they make of them afterwards.

Excessive and verbatim note-taking can interfere with students’ comprehension and may limit their ability to discriminate between important and less important points. Some lecturers separate lecturing from note-taking, allowing short periods for note-taking after short periods of careful attention. Some actually ban note-taking in order to encourage...
their students to think and ask questions during lectures instead of thoughtlessly recording information.

Here are some ways of helping your students to make and use notes in productive ways.

- Make the structure clear so that students make well organised notes that will be easy to follow afterwards.

- Explain the role note-taking should play during the lecture. The different kinds of lecture outlined earlier have different implications for note-taking and these can be made explicit:

  Much of the time I will be explaining ideas and it may not be helpful for you to take notes when I am doing that, except to record your own questions and thoughts. But I will summarise each section and when I do that I’ll suggest you take notes.

- Slow down when you think it would be useful for your students to take notes – not to dictation speed, but slow enough to allow students to record key points without missing what you are saying next. Conversely, you can speed up when you want students to listen and understand, and not take notes. The last part of a lecture may be particularly important for students to take notes on, and so it is essential not to rush it in order to squeeze everything in.

- Highlight key points by displaying them or flagging them up:

  So the key point, displayed on the slide here, is ...

- Distinguish examples from principles, and case material from conclusions, and make it clear which are important to note:

  So the principle here is X. The details of the previous examples don’t matter, except to help you to remember the principle, which you need to be able to state correctly ...

  [pause].

- Use handouts to provide a clear structure for note-taking, to reduce the burden of note-taking, and to guarantee accurate and full notes for revision.

- Make your own lecture notes and your transparencies available to students so that they can fill out their own notes, check for errors and omissions or compensate for having missed your lecture.

- Encourage students to write on and work with these handouts instead of just filing them away. Use layouts with space for annotation, wide margins for comments, space for additional details; omit some material – graphs or conclusions, for instance – so that students have to write them in for themselves. Refer to the handouts as you lecture, bringing key points to students’ attention.

- Look up during your lecture and take notice of what your students are doing. Have they stopped writing furiously and are waiting for you to continue? Are they writing when you want them to pay attention and think? Are they listening passively when you think they should be noting key points?

- Allow pauses in which students can catch up and review their notes. You may even want to use such pauses to encourage interaction:
Take a couple of minutes to catch up on your notes. Read back through what you have written and see if there are gaps or unclear bits. If there are, ask the person next to you if they have a note on this point. In two minutes I’ll answer any outstanding questions arising from these gaps before moving on.

There is a tension here between providing students with structure and support so that they produce notes you would recognise as accurate, and interfering with their freedom to make sense in their own way. In the end, it is a matter of professional judgement where the balance should lie.

**Activity 2.11 Use your students’ notes to measure your effectiveness**

Ask permission to have a look at two students’ notes – one from the front row and one from the back row – and compare them with the notes you lecture from. What are they good at noting and what do they tend to miss or get wrong? Are they taking notes evenly, or going to sleep in the middle of the lecture? Would it help these students to have your notes – or a version of them?

Read the evidence on student note-taking summarised in Chapter 2. What does this evidence have to say about the effectiveness of the note-taking methods you see your students using?

When I did this recently I had rather a shock. I had provided very full handouts, and most of the participants had written very little, apart from a few points scribbled around the margins. These scribbles were brief and idiosyncratic, and I found it difficult to understand what they meant. A couple of people had written extensive conventional notes. These were mainly accurate, but consisted of virtually continuous prose, revealing almost no structure.

The evidence provided in Chapter 2 suggests that these two patterns of note-taking are likely to produce very different learning outcomes. Those who wrote almost nothing may have remembered less. Those who wrote masses may have missed the key points. This suggests that it might have been better not to provide such full handouts, thus encouraging more note-taking while retaining the structure and key points.

**Handouts**

The main forms of handout that support or substitute for note-taking are these.

**Lecture outlines**

These might be one-page summaries containing the lecture title, headings and sub-headings and perhaps a diagram that summarises the structure without providing detailed content. This helps students to see the overall shape of the lecture, and guides their note-taking. Reduced copies of your transparencies or slides can perform the function of a lecture outline and can be printed two, four or six to the page using presentation software.
Full notes
These would contain the entire lecture in note form – perhaps up to five pages for an hour-long lecture. They would largely obviate the need to take notes, except to maintain attention and record personal thoughts; they might even obviate the need to turn up to the lecture. Full notes could be useful for dyslexic or hearing impaired students and for students with timetable difficulties. The downside is that such notes can encourage students not to think or be active during the lecture.

Gapped and incomplete handouts
These might contain some of what full notes would contain, but with short sections or key elements missing or with spaces for students to add their own notes or tackle problems or short tasks inserted into the lecture. Notes with which they have to do something can hold students' attention better than full notes. They can also generate a more active approach to the material and result in more personalised and useful notes for subsequent study.

Study notes
These focus on what students will do after the lecture. They might contain an annotated reading list, useful website addresses, problems, tasks or learning activities related to the lecture content or as preparation for other classes, case material to work on, and lists of other resources such as video, audio or computer-based material.

It is also possible to provide a mixture of these types, such as an outline containing some detail on particular topics and suggestions for further reading.

Activity 2.12 Experiment with different handouts
Produce two quite different forms of handout for one lecture, for example:
- lecture outlines
- full notes
- gapped and incomplete handouts
- study notes.
Give both handouts to everyone and ask them to tell you, the following week, which was most useful and what they would prefer in future.

Comment
Students may tell you they want both. The most important issues may be whether the handouts changed their learning behaviour during the lecture (for example, paying less attention) or afterwards (for example, leading to more reading). Your lecture is part of a wider pattern of learning which your handouts can influence.
Dealing with problems during lectures

Anxiety

It is unusual not to be a little anxious when lecturing, and a modest level of anxiety can actually improve performance. But too much anxiety can lead to physical problems with breathing and voice projection. It can also lead to you go too fast and lose track of where you are. There are some simple techniques for reducing anxiety.

- Check the room out beforehand. See where the lights and other controls are, how the overhead projector works, whether the seats are set up properly, and so on. Stand at the front and look around, and go to the back and see what the front looks like from there.

- Arrive earlier than the students so that it feels like your space that they are visiting, rather than the other way round. Then perhaps go out again and come in calmly when you are ready.

- Don’t let anyone distract you with conversation or questions just before you start. Allow yourself a few moments to focus your mind.

- Give yourself a minute to set up your notes and mentally rehearse your introduction, rather than rushing in. Allow the students to settle.

- Use slow, deep breathing, with a long, full, out breath, in order to relax your upper body. Learn some simple relaxation techniques or even meditation techniques if physical tension is a real problem.

- Practise your introduction out loud or draft the first sentence or two in full, even if you do not read it out.

- Begin with a familiar story, anecdote or case study you can relax into as you tell it.

- Establish eye contact with several students in different parts of the room while you do your introduction.

- Plan short activities or breaks for the students as this will give you breaks too, to compose yourself and get your notes and thoughts together. It is less anxiety-provoking to know that you have only 10 minutes to go till a break and not 60 minutes to go till the end.

- Use props such as cue cards or outline notes so that you can remind yourself at a glance where you are and where you are going next.

Late arrivals

Establish a clear policy that draws the potential problems to students’ attention:

If you have to arrive late I’d like you to try not to disrupt the lecture for those who have arrived on time. Please come in the back and sit down quietly. Can early arrivals please leave the back row clear for any late arrivals? If you are more than five minutes late please do not come in – you will be able to get lecture notes from the office.

Remind students of the policy if it is broken. If late arrivals are inevitable, pause for a moment, giving the disruption precedence, rather than pretending to ignore it.
Missing material

If you spot that you have missed something, be open about the problem, and explain to students where to go back to and where to return to afterwards:

I have missed out a point from the previous section – it fits in here in Section 2 and it adds to the point I made about ... Now let's get back to where I was in Section 3.

If you have completely lost your way, don't bluff. Say:

I have got myself lost. Please give me a moment ...

and take the time you need. If you need more than a moment, give the students a break too:

I need a minute to get myself organised for the next section of the lecture. Please take a minute yourselves to get your own notes in shape and then we will continue.

They will appreciate the break. A pause that feels like minutes to you will be experienced as seconds by your audience, so take your time.

Difficult questions

If you don't know the answer to a question, don't bluff or denigrate the question – be open:

I'm not sure I have the answer to that. It sounds like a good question. I'll make a note of it ... If the answer comes to me before the end of the lecture I'll come back to it, if not I'll find out before the next lecture and answer it then.

It is unreasonable to expect you to know the answer to everything and it will help to develop students' understanding of the nature of knowledge and of expertise if you do not pretend to know everything. Asking and answering questions is dealt with in Appendix 2.2.

Difficult students

Genuinely difficult or hostile students are thankfully rare. If you have behaved reasonably and are clearly well organised and trying hard, students will appreciate this even if things are not going well.

- Unreasonable student behaviour, such as talking or being distracting during the lecture, is resented by most students. They will appreciate the lecturer putting a stop to it and will support your intervention provided that it is undertaken with sensitivity:

  I'm finding it difficult lecturing while you are talking.

If you know students' names and use them, this will add to the gentle social pressure to conform.

- Rude and aggressive behaviour should not be tolerated or ignored, or it may recur, but confrontation should be avoided in public. Students do not like to see a fellow student attacked from a position of power, however inappropriate the student's behaviour:

  I do not think it is appropriate for me to respond to that right now, but I would like to discuss it with you afterwards please.
If this did not resolve the situation, you might have to say:

In the interests of everyone else here I am going to have to ask you to leave.

Afterwards a personal approach can be appropriate:

I found it very difficult when you interjected during the lecture. Is there a problem I should be addressing?

**AV equipment breakdowns**

AV equipment gets a hammering and is often poorly maintained and unreliable. It can throw you completely if there is a total breakdown when you are dependent on it. To minimise problems you can:

- Check the equipment as soon as you come into the room, giving yourself an outside chance of calling a technician and getting it mended or replaced in time; make sure you know the phone number to call.

- Become a bit of a technician yourself – most breakdowns are minor and may only involve changing a bulb or fuse, closing a loose lid or pressing the right button; check that you know how to handle minor problems with the AV equipment you most frequently use.

- Prepare good handouts so that, if need be, students can follow your lecture without visual displays.

- Remember that it isn’t your fault and that it does not mean that you are incompetent (unless you don’t know how to use the equipment).

### Activity 2.13 Coping strategies

Make notes about two or three incidents or problems you have experienced in your lectures and how you dealt with them. If these coping strategies worked, why did they work? If they did not, what else could you have done?

<table>
<thead>
<tr>
<th>Incident</th>
<th>How you handled it</th>
<th>Why it worked or failed</th>
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One problem I have often experienced is running over time and realising that I cannot get through all my material in the time remaining. I’ve tried a range of tactics, some of which work better than others, for example:
• Talking faster (which is consistently disastrous).

• Trying to get to the end by discarding several transparencies and skipping detail. This sometimes works, but it is difficult to make sensible decisions about what to drop while you are still lecturing. On several occasions I have lost my way as a result of departing from my prepared argument.

• Saying 'I've got more material left than I can get through. I'm going to summarise what is left very quickly and then allow you to ask me questions. I'll fill in the details around what you ask me instead of deciding for myself what to concentrate on.' Whether this works depends on the questions that come up first. If they are bad questions it ends limply and in confusion.

• Saying 'I have to make some tough decisions about how to structure the material for the remaining time. I'm going to take a minute to sort myself out. Please take a few moments to go over your notes.' In fact, it may only take me 30 seconds to re-plan the lecture – but this is 30 seconds I would not otherwise have had.

**Enhancing lectures for those with particular needs**

Lectures can be a difficult learning environment for students who have special needs. UCAS admissions forms identify students who have dyslexia, who are blind or partially sighted, deaf or hard of hearing, who are wheelchair users or who have mobility difficulties, personal care needs, mental health difficulties, or less visible conditions such as epilepsy. It may be your institution's policy to make this information available to teachers. If not, it is important for you to find out for yourself. I have a hearing difficulty myself and often say, at the start of a lecture:

> I am deaf in one ear and have difficulty hearing quiet speech over a noisy background - so please can you ask questions or talk one at a time - and I may have to ask you to repeat what you say. Is there anyone else who has special needs it would be helpful if I or all of us knew about?

The students with the special needs are almost always the best source of advice about how to make things easier for them, and student groups are usually eager to respond to clear requests to change their behaviour to help a student with special needs. For example, they may be willing to take notes or read out from handouts or from the screen. It is very difficult to meet all special needs, especially multiple needs, in the less than perfect conditions you may encounter in some classrooms, but the following guidelines may help.

**Visually impaired students**

• Provide any book list early to allow time for the loan of any Braille, large print or electronic copies which are available. If visually impaired students can get electronic copy they may be able to read very large print versions on screen or have the text read by a voice synthesiser.

• Provide the handouts and OHTs you will be using in advance, and use large print.

• Make your lecture notes available on disk for those who find it difficult to take notes.

• When writing on the board, announce what you are about to do and say out loud what you are writing.
• Take extra care with lighting as it may affect the screen, the board or students’ ability to see their own notes.

• Make an audio recording of your lecture available.

• Arrange for a sighted student to sit next to the visually impaired student. He or she can quietly read out what is on the screen or what is being referred to in a handout, and take notes that can be typed up and put on disk afterwards.

Mobility impairment

• Check the implications of the timetable for the student getting to and from your class.

• Make space available for a wheelchair if required.

• Students may find an hour-long session tiring and may find it difficult to write fast enough or for very long at a time.

Hearing impairment

• First gain the student’s attention and set the context: lip reading is heavily dependent on anticipating words so knowing what you are going to talk about is vital.

• Face the student and speak clearly. Do not shout, exaggerate lip movements, break up normal speaking rhythm or cover your mouth with your hand.

• Stand where your face is well lit and not in shadow, and relatively near to the student.

• Use a radio microphone if there is an induction loop in the room (indicated by an ‘ear’ sign).

• Provide full handouts, as lip-reading (or watching signing) precludes simultaneous note-taking.

• Use visual confirmation of what you are saying – for example OHPs summarising your points – but do not speak while expecting attention to visual aids.

• Minimise background noise, chatting, the hum of the overhead projector or other sounds which may mask your voice.

• Group work may be difficult. If individual students indicate with a gesture when they are about to speak, and face the student with the hearing impairment, these difficulties can be reduced.

• When you introduce new terminology, do it visually as well as orally.

Instructions for tasks in class and for assignments can be a particular problem for students with hearing or visual needs and various forms of dyslexia. You may need to take extra care to explain exactly what you are expecting students to do. Some students will need to use computers or other specialist equipment and may need more desk space than is common in lecture theatres; they may need a power point. However, it is difficult to generalise, so ask the students themselves.

If you encounter other particular needs, your institution probably has an adviser, linked to a student services office, and they will have information and access to specialist advice and possibly resources.