

Chapter 5

Reviewing Laboratory and Fieldwork Practicals

It makes things clear, often explains things in ways that maybe lectures can't. You can actually see it for yourself and work it out for yourself.¹

An Electrical Engineering Student

INTRODUCTION

Given the considerable contribution of practicals and fieldwork to many undergraduate courses, especially within the medical, physical and social sciences, it is important for any review of teaching to include these components whenever applicable. Practical and fieldwork are demanding in terms of preparation time for staff, and contact time for both staff and students. They also tend to consume a significant proportion of students' overall study time, particularly when it comes to writing up reports. Nevertheless, some research findings suggest that many students, particularly in the early years of a course, are unclear about how their practicals or fieldwork relate to the rest of the course and just what it is they ought to be getting out of them.

Practicals and fieldwork can, of course, be an expensive part of courses and may well be the target of cost-cutting exercises in the current context of rises in student numbers and static or decreased units of resource. Questions therefore arise as to whether there might be alternative ways or methods of teaching the material – 'dry labs' or simulation exercises, for instance, with or without computer assistance – which would prove more efficient or at least more economical. In this situation, the many and flexible opportunities afforded by practical and fieldwork may well need not simply to be reiterated, but to be robustly reaffirmed by feedback on their productiveness.

Despite the importance of practicals and fieldwork and the amount of time devoted to them, they receive surprisingly little attention in most

instruments for obtaining course feedback. Moreover, the feedback questions traditionally posed have tended to focus on the logistics involved, rather than to explore the quantity and quality of students' learning.

SETTING THE AGENDA

Deciding what to review and how to go about it may well be more complex than in other areas of teaching, particularly if you have the dual role of organising and overseeing a series of practicals, as well as actively running an individual practical group. And where teaching is to some extent delegated (e.g. to lab demonstrators) you are less readily able to keep track of how things are working out, especially with respect to how far the design of the practical(s) has succeeded in promoting and enhancing students' knowledge and skills.

In any review, you will want to strike a sensible balance between the potential benefits in terms of improving teaching and learning, and the amount of effort entailed in collecting and evaluating feedback. Accordingly, this chapter and the review materials it offers are geared towards collecting feedback in economical ways, which will also help ease the task of evaluating and acting on the information. The approach adopted is deliberately 'light-touch' in an attempt to streamline a process which could otherwise be unduly cumbersome.

In particular, the chapter emphasises the value of keeping tabs on student experiences on a practical-by-practical basis as the course proceeds. If this is done systematically, there are several advantages. For instance, it gives you a good sense of what is

going on for both students and demonstrators across the different occasions when the same practical is run. This then provides the opportunity to make adjustments on an 'as-and-when' basis, since even quite modest tweaking can result in considerable improvements. When you begin to get an overview of a sequence of practicals, minor changes that could either be immediately made or logged for future implementation may well suggest themselves.

Information collected in a regular, on-going way is likely to be more accurate and helpful than retrospective reflection and comment. Also, by the end of the course, you will already be alert to some of the strengths and weakness of the practicals and the teaching. And this accumulation of feedback data will mean that you can better target – if not reduce in amount – the additional information sought for a summative review.

LABORATORY PRACTICALS

As with other methods of teaching, it is desirable to clarify at the outset what for you as the teacher are the key dimensions of organising and teaching the practicals. Figure 5.1 indicates seven key dimensions you may need to consider, as well as suggesting the sorts of feedback questions relevant to each dimension. Inevitably a listing of this kind is only a starting-point, and will need adjusting in order to reflect your own teaching style and intentions, the nature of the specific practicals, and the broader course context. You may also want to be selective in which aspects you choose to monitor, and the particular blend of aspects attended to may of course change over time.

Once key dimensions and the questions associated with them have been spelt out, they can form the basis of a pro forma of the kind illustrated in figure 5.2. Such a pro forma could be used by either a solo teacher or by someone responsible for organising and overseeing practicals where others (e.g. demonstrators) are involved in the actual teaching. The completed pro forma shown in figure 5.2 has been filled out by the latter. While a pro forma of this type could be used for each practical, it is more likely to be employed periodically, whether at fixed points in the course or on specific occasions when it seems timely.

If you want to tap into the student perspective, without either asking for or generating too much information, then a fairly simple yet focused

KEY DIMENSIONS OF PRACTICAL WORK

1. Equipment and Facilities

- Is the best use being made of the space available?
- Are adequate amounts of the appropriate equipment and materials available?
- Is the equipment well set-up and working properly?

2. Health and Safety

- Are health and safety guidelines explicit and understood by all staff and students involved?
- Are all necessary safety measures observed at all times?
- Is everyone aware of emergency procedures and how to obtain first aid or other assistance?

3. Aims and Design

- Are the aims of the practical session(s) explicit and clearly articulated?
- Do knowledge and skills focused on in the practical(s) complement and extend those acquired by the students in the rest of the course?
- How in step with one another are the lecture(s) and practical session(s)?
- Is there a clear structure with well-sequenced activities for the practical(s)?
- Is the allocation of time for the different elements of the practical(s) realistic?

4. Preparation and Briefing

- Are both demonstrators and students given enough advance information for preparation?
- Does the written guidance help students achieve the objectives of the practical(s)?
- Do students understand how to carry out any follow-up activity and/or assessed tasks?

5. Interaction

- Are staff sufficiently competent to help students acquire the specific knowledge and skills entailed in the practical(s)?
- Is there an adequate staff-student ratio during the practical(s)?
- Are student groupings flexibly organised (size and composition) to suit the tasks?
- Are there opportunities for students to review outcomes and /or any unexpected results?

6. Assessment

- Are any assessed tasks well-matched to the overall objectives of each practical?
- Is marked work appropriately weighted in terms of the time and effort students need to give to the task?
- Is assessed work returned promptly?
- Are students given adequately detailed feedback which shows them how to improve?

7. Monitoring

- Are demonstrators encouraged to reflect on their own practice and effectiveness?
- Is there a system for staff to relay any difficulties encountered by students?
- Do you take stock periodically and identify what improvements can be made?

Figure 5.1

AN EXAMPLE OF A COMPLETED PRACTICALS PRO FORMA

1. Equipment and Facilities

For some reason (?), a large number of beakers were broken during the practical and there were insufficient spares in the cupboard. Implications for Friday's group?

2. Health and Safety

Students finally seem to have appreciated the importance of keeping goggles on at all times. Check who has replaced Ms Biggs as the nearest first aider.

3. Aims and Design

Now that the practicals are on a fortnightly cycle, students at the beginning of the week are more geared up for what's expected of them.

While most groups are coping fine, the second batch on Wednesdays are still having difficulty with getting through the work and neither the demonstrator nor myself can really figure out why. Maybe it's because they're a mixed group and their grasp of the maths we're currently covering in the lectures hasn't had time to bed down?

4. Preparation and Briefing

The instructions given in section 3 need to be made easier to follow as demonstrators this week have ended up giving a lot of additional assistance.

5. Interaction

Students are showing signs of recognising that they can learn a lot from one another and are not relying unduly on staff. Finding time (and energy!) to review what's happened at the end of the practical is still proving problematic - especially for that Wednesday group.

6. Assessment

Students in Chris's practical are complaining that their reports still haven't been returned, but other groups are fine. Reports are often more highly polished than they need to be and students therefore don't seem to have enough time to do the reading. How can we fix this??

Judging by my group's work at least the material covered in week 6 still isn't well understood.

7. Monitoring

Putting the standard report form on the server has really encouraged the demonstrators to report back on a regular basis, as well as in more detail.

Group sizes are okay for now, but if intake increases we'll have to adjust them accordingly (check with Pat at the beginning of next term what the predictions are).

Figure 5.2

questionnaire such as the one illustrated in figure 5.3 might be useful. The particular dimensions targeted could of course be adapted to suit your requirements. (Another example of a short questionnaire, which focusses on student learning in fieldwork, appears later in this chapter – see figure 5.9.)

Although the delegated nature of much practical teaching can mean that you as the organiser and overseer are somewhat removed from what is happening on the ground, the compensating characteristic is that you have other colleagues able to provide feedback from their various perspectives. Both demonstrators and lab technicians are particularly well-placed both to provide information about how the practicals have gone and to suggest improvements.

Tapping into this source can be achieved through a variety of means, with regular demonstrators'

meetings perhaps being the most common. Such meetings are very useful: for briefing purposes, as a support mechanism, for implementing minor on-course adjustments, and for reviewing how in the longer term the practicals might be improved. However, they may not be the best forum for generating data to inform a measured and detailed evaluation of individual practicals and practical groups. Impressions fade over time and immediate discussion of each practical would be unduly time-consuming with a large group of demonstrators.

One possibility for keeping a close track of the practicals is to ask each demonstrator to turn in (or email) at the end of every session a standardised report form which is quick and easy to complete. An example is given in figure 5.4. This would give the organiser of the practicals information about the logistics of each practical group (e.g. attendance,

A QUESTIONNAIRE ABOUT PRACTICALS²

Please put a tick in the appropriate box to indicate your response to each of the following statements about the practicals you attended as part of the course. Thank you very much.

	<i>strongly agree</i>	<i>agree</i>	<i>unsure</i>	<i>disagree</i>	<i>strongly disagree</i>
The practicals					
• covered key areas and ideas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• were well-linked to lectures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• helped relate theory to practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• were well-planned and structured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• were lively and stimulating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The demonstrator					
• made clear what was expected of students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• helped students with any difficulties they encountered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• was interested in students and their progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
As a student					
• I looked forward to the practicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• I enjoyed being in the practicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• I learned a lot from the practicals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please add below any comments about what would have made the practicals better for you:

Figure 5.3

DEMONSTRATOR'S REPORT FORM

Demonstrator: _____ No. of students attending: _____

Practical No.: _____ Day: _____ Time: _____

Proportion completing the practical? < 1/3 of class 1/3 - 2/3 of class > 2/3 of class

1. WHAT WENT WELL

- _____
- _____

2. AREAS OF DIFFICULTY Please tick any of the following which caused any difficulties.

- | | |
|--|--|
| a. <input type="checkbox"/> Equipment difficulties | b. <input type="checkbox"/> Insufficient technical aid at hand |
| c. <input type="checkbox"/> Time allocated for each stage | d. <input type="checkbox"/> Size or composition of subgroups |
| e. <input type="checkbox"/> Students' theoretical knowledge | f. <input type="checkbox"/> Students' skill base |
| g. <input type="checkbox"/> Students too dependent on demonstrator | h. <input type="checkbox"/> Students reluctant to ask for help |
| i. <input type="checkbox"/> Written guidance | j. <input type="checkbox"/> Other _____ |

Please briefly clarify below (indicating the relevant letter) the nature of the problem that arose.

3. ISSUES ARISING

- What could students do differently next time to get more out of the practical?

- What would you as the demonstrator want to do differently next time?

- Any other comments or suggestions for improvement?

Figure 5.4

COLLATED SUMMARY OF DEMONSTRATORS' REPORTS

Practical No.: 3 Average session attendance 26/30 No. of log sheets returned: 6/6

Tally of proportions completing the practical work

<input type="checkbox"/> <1/3 of class	<input type="checkbox"/> 1/3 - 2/3 of class	<input type="checkbox"/> >2/3 of class
1 2 3 4 5 6	1 2 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 5 <input checked="" type="checkbox"/> 6

1. WHAT WENT WELL

- Got going much more quickly now that the equipment difficulties are resolved (x4).
- Several comments to the effect that students are getting more confident and seem to be enjoying it!
- 2 demonstrators noted that fewer questions are being asked about the theoretical underpinnings of the practical.

2. AREAS OF DIFFICULTY

- | | |
|--|---|
| <p><input type="checkbox"/> Equipment 1 2 3 4 5 6</p> | <p><input type="checkbox"/> 2 Technical assistance 1 2 3 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Technician ill for 2 days last week.</p> |
| <p><input type="checkbox"/> 5 Time allocated for each stage <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 6
Strong feeling that it is still too front-loaded; the end is a real scramble.</p> | <p><input type="checkbox"/> 1 Size or composition of subgroups 1 2 <input checked="" type="checkbox"/> 4 5 6
For this group, self-selection of subgroups doesn't appear to be working.</p> |
| <p><input type="checkbox"/> 1 Students' theoretical knowledge 1 2 3 4 <input checked="" type="checkbox"/> 6
The 1st Monday's class didn't have the benefits of Tuesday's lecture and seemed to find it much harder going.</p> | <p><input type="checkbox"/> 0 Students' skill base 1 2 3 4 5 6
(Definitely improving!!)</p> |
| <p><input type="checkbox"/> 6 Students too dependent on <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 6 demonstrator
(See Below).</p> | <p><input type="checkbox"/> 0 Students reluctant to ask for help 1 2 3 4 5 6</p> |
| <p><input type="checkbox"/> 6 Written guidance <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 6
Suggested that it might be worth including the specific formulae at the start of Section A.</p> | <p><input type="checkbox"/> 3 Other 1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 5 <input checked="" type="checkbox"/> 6
Lots of queries about the revised submission dates for reports.</p> |

3. ISSUES ARISING

- Practical too front-loaded
- Selection of subgroups in the Tuesday afternoon practical
- Monday practical out of synch with lectures
- Specific formulae in section A
- Due dates for reports

Figure 5.5

proportion of the class completing the exercise). It could also provide important insights into how well the practical was designed and functioned. A very real additional benefit of a report form can be to encourage self-reflection in demonstrators (who might also want to include copies in a teaching portfolio or dossier on their work if they were following an award-bearing programme of initial training in higher education teaching). And if appropriate, a similar pro forma could be devised for completion by lab technicians.

While collecting and analysing information from demonstrators and technicians on a regular basis is clearly demanding, there are some substantial pay-offs in the longer as well as the short term. The

process need not be an undue burden if an efficient collation method is used like the one illustrated in figure 5.5. This example, which employs the same headings and criteria as in the demonstrator report form (figure 5.4), shows the composite results of summarising and evaluating demonstrators' reports concerning six different practical groups.

Once you have a global overview of the practicals and have noted the issues arising, an organiser's log can help in deciding on the action to be taken, by whom, and when. Figure 5.6 is an example of a log for use by organisers of practicals. The extract shown relates to the issues logged in figure 5.5, and indicates the revisions which are to be made together with the time-frames for doing so.

EXTRACT FROM A PRACTICALS LOG				
WK	ISSUES ARISING	ACTION TO BE TAKEN	WHEN	✓
4	- Practical too front-loaded.	See whether the focus of practicals 2, 3, & 4 can be re-jigged so that there's a more even distribution of work between them.	At course review time.	
4	- Selection of sub groups in the Tuesday afternoon practical.	Ask the demonstrator to make sure that the subgroups are more mixed in terms of ability levels.	Now.	✓
4	- Monday practical out of sync with lectures.	Probably have to live with it, but Sandy suggests that a note of key-points of the lecture could be made available at the end of the previous week's lectures.	Try to do by the end of term.	
4	- Specific formulas in section A.	Discuss further with demonstrators about what exactly would be most helpful here.	Next demonstrators meeting.	
4	- Due dates for reports.	Ask demonstrators to make a general announcement and I'll flag it on the web site.	Now	✓

Figure 5.6

FIELDWORK PRACTICALS

At the beginning of this chapter we referred to the financial and resource pressures which have in some cases led to reductions in the amount of laboratory work or to the substitution of dry for wet labs. These same pressures can also adversely affect fieldwork practicals. Fieldwork in many disciplines is at risk of being viewed as an 'optional extra', rather than as a core course component. Even in areas where fieldwork practicals are seen as indispensable, you may feel yourself to be under an increased onus to demonstrate the very real contribution which they make to student learning. A better articulation of the educational benefits to be derived from fieldwork may be needed in order to justify the expenditure of time, effort and money – both by the department and by the students.

Fieldwork practicals run the spectrum from 'look-see outings' through structured field exercises to students working unsupervised in the field on an independent project. If well-planned and executed, fieldwork practicals, like those held in the laboratory, can help synthesise students' knowledge and understanding, encourage student interest and involvement, develop observational, recording and

analytical skills, as well as build confidence. However, the flexibility and variety which are one of the great strengths of fieldwork also mean that any review has to be tailored to the particular form of fieldwork concerned. Using a single off-the-shelf feedback instrument is seldom likely to be appropriate.

Working in the field typically involves a high level of investment on your part in exercises which are less within your direct control than other teaching and learning activities that take place within the home institution. Fieldwork can take a lot of time and trouble to organise (including making contingency plans) and student safety is often an issue of very real practical concern. If fieldwork is not a regular part of the course, students may be less keenly aware of what is expected of them, and the learning outcomes themselves tend to be less predictable than in, for example, a structured laboratory setting. The stakes are bound to be high, especially if there is only one chance to get it right. In addition, factors such as the weather or other people's co-operation can have a disproportionate influence both on the actual outcomes and on perceptions of success.

REFLECTIONS ON A FIELDWORK PRACTICAL: A PRO FORMA³

As soon as possible after a fieldwork practical write a short account of what took place. Concentrate on what actually happened.

Then try to identify the following:

- Planned things I did – before and/or during the field trip – which helped students learn.

- Anything unplanned I did during the trip which seemed to be helpful.

- Anything – planned or unplanned – which may have hindered students' learning.

Figure 5.7

As a result, it is easy to allow the logistical details, the enjoyment factor or other immediate impressions to colour – whether negatively or positively – your assessment of how worthwhile a particular field trip has been. Thus, your approach to review may need to find a way of counterbalancing any tendency to take a somewhat polarised view of what has happened so that the strengths and weaknesses of the teaching and learning are not obscured.

Taking stock of your own analysis of the outcomes in a systematic way soon after a fieldwork exercise has been undertaken enables you to take forward 'lessons learned' into either future activities or the same field trip on another occasion. One way of prompting yourself to do this on a consistent basis is to make use of a short pro forma. Figure 5.7 opposite is one example and another (for adaptation) can be found in Chapter 3, figure 3.2. A more extended approach would be to tailor to your fieldwork activity the laboratory practicals pro forma given in figure 5.2.

As with laboratory practicals, people other than yourself may be involved in assisting with teaching in the field – with or without you being present. In either case it is helpful to check out how well the field trip was managed, and for this the kind of checklist reproduced in figure 5.8 can be of assistance. It will help promote self-reflection for either yourself or someone else.

Capturing how students have reacted to the fieldwork and what they have learned can be done in various ways, depending, for example, on whether the focus of attention is a single field trip or a series. One possibility is to use the post-it 'continue, stop, start' method outlined in Chapter 7.

Another very practical way of reviewing a single field trip is to provide each student with an index card which will be collected in at the end. One side is labelled 'things learned' and the other 'suggestions'. During the course of the fieldwork they can then note down a couple of key learning outcomes as they occur, together with any ideas for making the trip more productive. The use of index cards makes it easy to collate the comments by theme, ready for subsequent analysis.

Hopefully students will identify your intended learning outcomes, but there may also be some equally pleasing unanticipated results, which you may want to try to build-in for another occasion. If, on the other hand, some of the key outcomes you

LEADING FIELDWORK: A SELF-MONITORING CHECKLIST⁴

Record by means of a tick (✓) in the appropriate column the comments which come closest to your opinion.

	well	satisfactorily	not very well
<i>How well did I ... ?</i>			
make sure that students had the necessary materials, instructions, equipment, etc.			
get the fieldwork underway promptly			
try to ensure that all the set tasks were completed in the time available			
keep track of progress across the whole class			
handle students' questions and queries			
provide help when students encountered difficulties			
respond to students as individuals			
help sustain students' interest			
bring things to a close and indicate follow-up task(s)			

Figure 5.8

STUDENT PERCEPTIONS OF FIELDWORK

	FIELDTRIP 1	FIELDTRIP 2	FIELDTRIP 3
	✓✓ ✓ X XX ?	✓✓ ✓ X XX ?	✓✓ ✓ X XX ?
1. How well prepared did you feel in terms of...			
• logistics (e.g. joining instructions, equipment needed)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• the work you were asked to do beforehand (e.g. reading)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• knowing what you were supposed to get out of the fieldtrip?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. During the fieldtrip...			
• did you have enough information to feel reasonably confident about what you were doing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• how well did your group work together?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• did the activities planned engage your interest?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. To what extent did the fieldwork extend...			
• your knowledge?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• your understanding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• your skills?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Please note any suggestions for improvement (be as specific as you can).

Fieldtrip 1 _____

Fieldtrip 2 _____

Fieldtrip 3 _____

Figure 5.9

had anticipated were not in evidence, you may need to take immediate action to make up the lost ground. You will also have to embark on a careful reappraisal of what happened. For example, were the students adequately prepared before undertaking the fieldwork, or will adaptations be needed to the design and implementation of the fieldwork itself? The students' own suggestions may help provide some pointers as to what action could be taken.

Lastly, you might opt to tap into students' perceptions by using a questionnaire of the kind illustrated in figure 5.9. Although the main part of the questionnaire simply asks students to respond by ticking the appropriate boxes, it also invites students to suggest ways in which the fieldtrips might have been improved. Here again, you may come across some comments and ideas which you had not anticipated, but could put to good use.

REFERENCES

- 1 Entwistle, N., Hounsell, D., Macaulay, C., Situnayake, G. and Tait, H. (1989) *The Performance of Electrical Engineering Students in Scottish Higher Education. Final Report to the Scottish Education Department.* University of Edinburgh, Department of Education and TLA Centre. p.63.
- 2 This questionnaire draws on ideas from publications such as Ramsden, P. and Dodds, A. (1989). *Improving Teaching and Courses: A Guide to Evaluation.* 2nd edn. Melbourne: University of Melbourne. But it has its origins in a questionnaire for the evaluation of small group teaching produced by the Advisory Centre for University Education at the University of Adelaide. See Roe, E. and MacDonald, R. (1983). *Informed Professional Judgment: A Guide to Evaluation in Post-Secondary Education.* St Lucia: University of Queensland Press. pp.180-82.
- 3 This is very much based on a checklist devised by Graham Gibbs which appears in Brown, S., Jones, G. and Rawnsley, S. (1993). *Observing Teaching.* SCED Paper 79. Birmingham: Standing Conference on Educational Development. p.37.
- 4 Adapted from a self-evaluation checklist in Gibbs, G., Habeshaw, S. and Habeshaw T. (1988). *53 Interesting Ways to Appraise Your Teaching.* Bristol: Technical and Educational Services. p.62

SEE ALSO

- Boud, D., Dunn, J. and Hegarty-Hazel, E. (1989). *Teaching in Laboratories.* Milton Keynes: Open University Press.
- Exley, K. (1994). *Laboratory and Practical Work.* Nottingham: Training and Staff Development Unit, University of Nottingham. [Includes material from Exley, K. and Moore, I. (1993). *Innovations in Science Teaching.* SCED Paper 74. Birmingham: Standing Conference on Educational Development].
- Horobin, R., Anderson, B. and Williams, M. (1992). *Active Learning in Practical Classes.* Sheffield: CVCP/USDU [now UCoSDA].
- Williams, M. and Horobin, R. (1992). *Active Learning in Fieldwork and Project Work.* Sheffield: CVCP/USDU [now UCoSDA].

