

Jane Treacher and Viv Ellis (2002), writing in the book Learning and Teaching in Secondary Schools Learning Matters (www.learningmatters.co.uk) summarise the key points of assessment as follows:

'Assessment is an integral part of teaching and learning
It is a process by which we make judgements about students' learning
Effective formative assessment (including student self-assessment) is a key part of raising standards of attainment
Summative assessment is used to measure students' progress and attainment but also school effectiveness
Trainee teachers need to be able to use their analysis of students' learning in a dialogue with parents, carers and others involved in the education of students.' (Treacher and Ellis 2002)

Whilst it will be necessary to construct a programme that allows trainees to gain the experience and skills necessary to be able to assess effectively, it should also be a feature of training that the nature and role of different modes of assessment be explored. This could be done through a historical consideration of the development of assessment within school practice within the UK and the purposes that these forms of assessment are used for.

The area of assessment can be a daunting one calling as it does on experience. It is important that at this stage of a teacher's development opportunities are provided to use a range of methods – observation, questioning, discussion and marking work – in order to judge progress. The experience needs to be built up over time. The Qualifying to Teach handbook makes it clear that 'trainees will not be expected to evaluate the learning of all pupils against all learning outcomes on all occasions.'

The centrality of assessment to the learning experience could be conveyed by the structure of the lesson planning document. Assessment for learning is likely to be seen during observations of the trainee teaching.

Reporting is an aspect of the role that trainees are required to be aware of, although it is not a requirement that the trainee actually does report on pupils' progress. It will be necessary for the trainee to demonstrate that they are aware of the statutory requirements relating to reporting.

Martin Monk and Jonathan Osborne (2000)(eds) Good Practice in Science Teaching – What Research has to say Open University Press

This text contains two relevant chapters.

Chapter 2 is on formative assessment by Paul Black and Chris Harrison of Kings College London and chapter 9 is on summative assessment by Julian Swain.

The chapter on formative assessment is 'based on the ...review of research evidence on formative assessment.'

The chapter is divided into three main sections:

- Guidelines for improving classroom practice based on the research evidence, including a couple of examples
- Research evidence about the quality of assessment practice
- Implications for practice and obstacles to success:

The final section uses research evidence to support a series of teacher behaviours for example:

- Choosing tasks carefully – planning for formative assessment
- Using a wide variety of sources and types of evidence
- Giving pupils time to think about their responses
- Preparing dialogue that provokes pupils' ideas and taking all their ideas seriously
- Linking feedback to criteria of learning , not to norms or marks or grades
- Conveying aims, promoting self- and peer assessment
- Learning from pupils
- Believing that all pupils can learn

Julian Swain in his chapter on summative assessment uses the research data to come to the conclusion that the 'existing definitions on summative assessment seem to be limited and too often fail to utilise the potential in the data generated.' The contention is carried

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that 'summative data should lead, almost automatically, to questions, to analysis, and hopefully to answers, and so provide the essential ingredient in the feedback loop of teaching learning and assessment.'

Rod Watson, Valerie Wood–Robinson and Anne Goldsworthy (2000) Targeted Learning: Using Classroom Assessment for Learning ASE

This book is one outcome of the AKSIS (ASE and King's College Science Investigations in Schools) project. This was a three year research project (1997 to 1999) which was funded by the Wellcome Trust.

'This book is about formative assessment in scientific enquiry work...[i]t is about helping pupils in their own on-going learning.'

The book has been structured so that it can be used for either individual study or as the basis of group training activity by people working with Key Stage 2 or Key Stage 3 pupils. The book is structured sequentially into six sections:

- An overview of targeted learning and raising standards
- Being clear about progression in a particular scientific enquiry
- Communicating aims
- Understanding classroom assessments
- Knowing what to do next
- Getting it all together

Each section has a series of activities that provide suggestions for reflecting on practice, for example 'finding out if the class understands the assessment of scientific enquiries.'

There is a useful reference section.

Keith Ross, Liz Lakin and Peter Callaghan (2004) Teaching Secondary Science (2nd edition) David Fulton

This book has three chapters that relate to assessment. Each chapter has a useful orientation at the beginning and a summary of the main points

Chapter 17: Formative assessment: responding to the pupils' work

Discusses the reasons why it is important that pupils' work is marked.

It covers the:

- Management issues

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- Good practice issues
- Motivation issues.

The chapter covers the differences between formative and summative assessment

The chapter is broken into two sections:

- Professional requirements for marking
- How to mark: styles of formative assessment

The chapter has a useful summary with bullet-pointed tips.

Chapter 19 – summative assessment

In this chapter we will address issues related to assessment and as in Chapter 18, address some basic questions concerning the reasons for marking

We will suggest how you can manage the marking load more efficiently and help reduce it. There is also the introduction to the Threshold Pay award that currently affects those teachers who are on point 9...

At the end of the chapter you will be able to

Relate your marking to SATs, GCSE, GNVQ or other appropriate levels; this can be used as the basis for promotions and demotions for individual pupils

Question your own marking strategy

Chapter 20 Assessment of Investigations

Investigations are essentially problem solving scientific exercises carried out by pupils in groups or individually. They form an important aspect of National Curriculum 'Science 1' (Scientific Enquiry) and are assessed by the teacher, as part of the GCSE examination. We begin by looking at their somewhat chequered history in schools but the focus of this chapter is on their administration and assessment at GCSE.

Section titles:

Why Investigate

National Curriculum 2000

How does the Science 1 assessment procedure work?

How do schools use and assess investigations?

A partial investigation

Marking procedure

The pupil as scientist

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Steve Alsop and Keith Hicks (2001) Teaching Science A Handbook for Primary and Secondary School Teachers Kogan Page

Chapter 10 considers the topic of assessing science achievement setting out as its objectives: 'this chapter facilitates critical reflection on issues of assessment in science education. More specifically, the chapter explores, in the context of science education:

- The influence of assessment on the curriculum
- Formative and summative assessment
- How we can assess more effectively
- The role of assessment in teaching and learning'

The chapter then develops a consideration of the reasons why assessment is carried out and offers some tasks for example an observation task on assessing pupils' achievement and a practice task on preparing summative assessments.

In addition the chapter gives some consideration of the use of formative assessment in a constructivist framework. A summary and further reading is provided.

Jerry Wellington (2000) Teaching and learning secondary science: contemporary issues and practical approaches Routledge

Chapter 1 The art and craft of science teaching contains a section on assessing and evaluating learning (and teaching) which considers:

- What is assessment for?
- Types of assessment
- The need for variety and differentiation in assessment

Chapter 5 on planning and managing learning in science has a section on asking questions which is broken into subsections on:

- Why ask questions?
- When to ask questions?
- What kind of questions can be asked?

A further section on *how should questions be prepared and delivered in a classroom* is supported through a table *Guidelines for Questioning* which has three sections:

- Preparing and phrasing questions
- Presenting and delivering questions
- Accepting and dealing with responses.

Hayes P (1998) Assessment in the Classroom in Mary Ratcliffe (ed) ASE Guide to Secondary Science Education Stanley Thornes

This chapter starts off with the statement '[a]ssessment strategies should be at the heart of teaching and learning. Learning is improved where there are clear assessment policies and effective use of formative assessment. Good use of summative assessment data can help long-term planning.

The chapter is divided into sections:

- Purposes of Assessment
- Marking of Pupils' Work
- Assessment Instruments
- Assessment of Practical Work
- Formative and Summative Assessment
- Target Setting
- Benchmarking
- Value Added

The chapter is supported by useful references and further reading