Effective Questioning

Research evidence suggests that effective teachers use a greater number of open questions than less effective teachers. The mix of open and closed questions depends on what is being taught and the objectives of the lesson.

However, teachers who ask no open questions in a lesson may be providing insufficient cognitive challenges for pupils. Questioning is one of the most extensively researched areas of teaching and learning. This is because of its central importance in the teaching and learning process. Most research falls into three broad categories:

• What is effective questioning?

• How do questions engage pupils and promote responses?

• How do questions develop pupils' cognitive abilities?

What is effective questioning?

Questioning is effective when it allows pupils to engage with the learning process by actively composing responses. Research (Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001) suggests that lessons where questioning is effective are likely to have the following characteristics:

• Questions are planned and closely linked to the objectives of the lesson.

• The learning of basic skills is enhanced by frequent questions following the exposition of new content that has been broken down into small steps. Each step should be followed by guided practice that provides opportunities for pupils to consolidate what they have learned and that allows teachers to check understanding.

• Closed questions are used to check factual understanding and recall.

• Open questions predominate.

• Sequences of questions are planned so that the cognitive level increases as the questions go on. This ensures that pupils are led to answer questions which demand increasingly higher-order thinking skills but are supported on the way by questions which require less sophisticated thinking skills.

• Pupils have opportunities to ask their own questions and seek their own answers. They are encouraged to provide feedback to each other.

• The classroom climate is one where pupils feel secure enough to take risks, be tentative and make mistakes.

Most research emphasises the importance of using open, higher-level questions to develop pupils' higher-order thinking skills. Clearly, there needs to be a balance between open and closed questions, depending on the topic and objectives for the lesson. A closed question, such as 'What is the next number in the sequence?, can be extended by a follow-up question, such as 'How did you work that out?'

Overall, research shows that effective teachers use a greater number of higher order questions and open questions than less effective teachers.

However, research also demonstrates that most of the questions asked by both effective and less effective teachers are lower order and closed. It is estimated that 70–80 per cent of all learning-focused questions require a simple factual response, whereas only 20–30 per cent lead pupils to explain, clarify, expand, generalise or infer. In other words, only a minority of questions demand that pupils use higher-order thinking skills.

How do questions engage pupils and promote responses?

It doesn't matter how good and well-structured questions are if pupils do not respond. This can be a problem with shy pupils or older pupils who are not used to highly interactive teaching. It can also be a problem with pupils who are not very interested in school or engaged with learning.

Research identifies a number of strategies which are helpful in encouraging pupil response. (See Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001; Rowe 1986; Black and Harrison 2001; Black et al. 2002.)

Pupil response is enhanced where:

• There is a classroom climate in which pupils feel safe and know they will not be criticised or ridiculed if they give a wrong answer;

• Prompts are provided to give pupils confidence to try an answer;

• There is a 'no-hands' approach to answering, where you choose the respondent rather than have them volunteer;

• 'Wait time' is provided before an answer is required. Research suggests that 3 seconds is about right for most questions, with the proviso that more complex questions may need a longer wait time. Research shows that the average wait time in classrooms is about 1 second (Rowe 1986; Borich 1996).

How do questions develop pupils' cognitive abilities?

Lower-level questions usually demand factual, descriptive answers that are relatively easy to give. Higher-level questions require more sophisticated thinking from pupils; they are more complex and more difficult to answer. Higher-level questions are central to pupils' cognitive development, and research evidence suggests that pupils' levels of achievement can be increased by regular access to higher-order thinking. (See Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001; Black and Harrison 2001)

When planning higher-level questions, most teachers find it useful to use Bloom's taxonomy of educational objectives (Bloom and Krathwohl 1956) to help structure questions which will require higher-level thinking. Bloom's taxonomy is a classification of levels of intellectual behaviour important in learning. The taxonomy classifies cognitive learning into six levels of complexity and abstraction:

1 Knowledge – pupils should: describe; identify; recall.

2 Comprehension – pupils should: translate; review; report; restate.

3 Application – pupils should: interpret; predict; show how; solve; try in a new context.

4 Analysis – pupils should: explain; infer; analyse; question; test; criticise.

5 Synthesis – pupils should: design; create; arrange; organise; construct.

6 Evaluation – pupils should: assess; compare and contrast; appraise; argue; select.

On this scale, knowledge is the lowest-order thinking skill and evaluation is the highest. Bloom researched thousands of questions routinely asked by teachers and categorised them. His research, and that of others, suggests that most learning focused questions asked in classrooms fall into the first two categories, with few questions falling into the other categories which relate to higher-order thinking skills.

The 'Thinking Hats' of Edward de Bono can also be used to develop higher-order thinking skills. The premise of the method is that the human brain thinks in a number of distinct ways which can be deliberately challenged, and hence planned for use in a structured way allows development of tactics for thinking about particular issues. De Bono identifies six distinct directions in which the brain can be challenged.

- **Managing** Blue – what is the subject? What are we thinking about? What is the goal? Can look at the big picture.
- **Information** White – considering purely what information is available, what are the facts?
- **Emotions** Red – intuitive or instinctive gut reactions or statements of emotional feeling (but not any justification)
- **Discernment** Black – logic applied to identifying reasons to be cautious and conservative. Practical, realistic.
- **Optimistic response** Yellow – logic applied to identifying benefits, seeking harmony. Sees the brighter, sunny side of situations.
- **Creativity** Green – statements of provocation and investigation, seeing where a thought goes. Thinks creatively, out of the box.

By mentally wearing and switching 'hats', thinking can be focused or redirected. (De Bono 1985).

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