

## **Task 8 - Assessed PDP\* entry on Teaching and learning - elicitation**

This assessed entry is to evaluate your findings from the elicitation of pupils' conceptual problems in learning science, using relevant literature and your school observation experiences.

Choose 3 groups of about 4 to 6 pupils from (say) Y7, Y9 and Y11 and try them out on adults too. Perform a group interview with them on a specific science concept. Each interview to last 5 to 10 minutes. Use concept cartoons, Driver (1994) or RLC\* chapter 5 for ideas – try to find out whether misconceptions are really there – ask them to explain their responses to your questions. Try to tape record the interviews.

Your 500 word report should contain (use appendices to supply supporting transcripts, data and interview details):

- an account of what is already known about your particular misconception, by drawing on research reports to put this experience into a wider context. Start with Driver et. al. (1994) and pick up further references from there;
- a brief report on the interviewing to identify their ideas;
- a discussion of why they might hold any 'alternative' ideas – look for grains of truth in what they say.

Leave until later the teaching and learning strategies you would use to challenge their beliefs (that will form the basis of further assessed PDP entries) and concentrate here only on *eliciting their existing ideas*.

You should provide tape recorded extracts/transcript extracts as an appendix to illustrate their ideas (but don't transcribe the whole tape!).

**GS001 – These two PDP entries (2 and 8) to be submitted by 18<sup>th</sup> November**

### **Star comments used for feedback to assessed PDP entries.**

You may find these comments from previous years helpful as you are working on this assignment (these numbers, and others, will be used during marking of assignments to give you more detailed feedback - it is a technique you may like to adopt with your classes in school – RLC page 75):

#### **General Comments (used for all assignments)**

**\*10** You should be using the Harvard system in full for referencing. No need for ref. numbers - Just 'Newton (1666 page 43)' in text, and the authors listed alphabetically at the end, with full publishing details.

**\*11** Take care with apostrophes in possessives, but note *his hers its* but *it's=it is*.

**\*12** Don't use pupils' original work - use photocopies and return originals.

**\*13** a phenomenon, but several phenomena (from Greek) SepArate, prepAration.

**\*14** Make sure your appendix is paginated so items included in it are easy to refer to and find.

## Children's ideas (Task 8)

\*30 Incorrect? Wrong? ... or are children's ideas useful, but limited? Our science ideas may be too contradictory to every-day experiences ever to be useful to many children and adults, even though we find their wider applicability essential to our scientific world-view. (see \*33)

\*31 Must we **over-ride or replace** children's ideas? Are they too well used in everyday life to discard (no animals allowed, there is energy in fuels)? Perhaps we need instead to make the pupils **aware** that there is conflict, and to show the limitations of both the scientific and the every-day versions?

\*32 Those who question the "Taken-for-granted" make the biggest strides forward in our understanding of the world. See "Grains of truth" for some comments we tend to take for granted

\*33 Scientific ideas, models, metaphors are useful but not absolutely true - so it is helpful to show, not only where they help our understanding of a phenomenon, but also when they break down, and become inappropriate. (see \*30)

\*34 It may not be necessary to make children's ideas explicit on every occasion - if teachers are aware of the range of ideas children might have, they can provide appropriate learning materials - see \*31

\*35 Paradigm shifts are not instantaneous - several refutations are needed coupled with a dissatisfaction with the existing paradigm. Several of you mentioned how tenacious children's existing ideas appear to be - but see \*31

\*36 I'm not very happy about the word 'fact', since it implies something absolute 'out there'. We all see things differently, and observation is always a combination of our preconceptions and the incoming sense data. Why not talk of *experiences* that have to be explained, rather than facts? ... see \*33

\*37 ... in the same way 'definitions' have no real meaning until you make links with other concepts - learning a definition tells you very little. By saying "**The** definition..." implies that there is one right one - who decides? I like Sutton's (1992) burr model of a concept, with its core of definition (the seed), and its links (burrs) to other concepts to develop its meaning, where it can link or hook onto other ideas.

\*38 The **constructivist** approach must not be confused with **discovery** learning - evidence shows that pupils discover little by doing experiments, unless they have a clear idea of why the experiment has been set up, and what sort of outcomes are possible - in this way experiments are used to test out ideas. If pupils only hold their naïve ideas, then the experiences will only serve to confirm their beliefs. New ideas usually need to be suggested by the teacher, and these can then be tested against the old, possible in the laboratory, but certainly by a consideration of 'real-life' experiences.

\*39 As a research exercise the elicitation stops here, but as a teacher you need to respond to what you heard/read, just as you would in a lesson. The advantage of dividing the elicitation from the teaching, is that you might persuade pupils that you **really** are interested in **their** ideas, and that they might actually tell you - whereas in a lesson they are more likely to tell you what they think you want to hear.

PDP = Professional Development Portfolio – submitted at the end of the year to support their claim for QTS

RLC = Ross, K., Lakin, E. and Callaghan, P. 2004 *Teaching Secondary Science* (second edition) London: David Fulton

## References

Sutton, C. (1992) *Words, Science and Learning*, Buckingham: Open University Press. Driver, R., Guesne, E and Tiberghien, A. (Eds) (1985) *Children's Ideas in Science*, Milton Keynes: Open University Press

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