



A THEORIST IN EVERY CLASSROOM

Rupert Knight considers one approach to linking theory to practice

Theory and practice are an odd couple. There seems little doubt that theory deserves a place within today's primary classrooms, perhaps more than ever. After all, last year's reviews of the primary curriculum hint at a return to greater autonomy and professional judgement for the classroom practitioner in English primary schools. And, inspired by countries such as Finland, there is currently a move to turn teaching into a Master's level profession. This odd couple, however, traditionally have a troubled relationship. Pring (2004) suggests that theory is perceived as having come adrift from common sense. It is easy to see how, swept along in the daily pressures of the job, busy classroom teachers may question the relevance of seemingly abstract ideas cultivated far from their own experiences.

Nevertheless, the influence of well-established theories is never far from the surface in almost any primary science lesson. The importance attached to children's own experiences and discoveries as powerful steps towards the modification of ideas

is deeply rooted in Piaget's ideas and the notion of constructivism. The value of group work and discussion follows a line of social constructivist thinking established by Vygotsky (1986). These are just two instances of the often-invisible concepts underpinning everyday practice. While it is likely that developing a greater familiarity with these ideas may enhance practice, it is asking rather a lot of primary teachers to head for the library and delve into academic texts when faced with a multitude of more pressing priorities.

It seems clear that a gap exists between the broad generalisations of academic research and the specific practical expertise of the classroom teacher. Bridging that gap is our challenge.

What might be more productive is to move away from the idea of simply seeking to apply previously learned theory. Perhaps we need to start with what teachers know: their own practice. One of many alternative models is provided by Lunenberg and Korthagen (2009), drawing on a strong tradition of so-called 'realistic teacher education' in the Netherlands. Teachers' expert knowledge is presented as a

triangular relationship involving 'experience', 'practical wisdom' (a firm grasp of the essentials of a specific situation) and 'theory'. Any of these can be taken as the starting point for making meaningful connections. Using classroom experience as the starting point, the emphasis can shift away from putting into practice abstract theories from outside towards developing one's own. To put it another way, the focus becomes identifying, classifying and explaining 'what works' with a view to theorising our own practice.

One example: collaborative group work

Repeated experience in my own classroom demonstrated that achieving full participation in collaborative group tasks was a particular difficulty in science lessons. Experience alone, however, led to little more than fine-tuning of my regular practices. Over time, I also amassed more and more practical wisdom and this helped to enhance the process: I became sensitised to the key issues at the heart of the situation (such as the need for inclusion and the



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relatively untapped potential of peer discussion). A certain clarity and sense of purpose were emerging, but my personal capacity to conceive of possible solutions remained limited. It was at this point that I felt ready and, crucially, motivated to explore the literature in the field. Drawing on the work of researchers such as Neil Mercer (see, for example, Mercer and Littleton, 2007) on exploratory talk, I was able to see the situation from a new perspective. These ideas were not taken 'off the shelf' but were filtered and adapted according to my own existing expertise until a model took shape that was appropriate for my specific circumstances and those of my pupils. In short, from these three sources, I had formalised my own theory: theory with a small 't' perhaps, but theory all the same.

The trick, of course, is to find ways to begin this reflective process in school. The example above involved an individual journey. However, as it is vital for teachers to begin articulating and sharing their wealth of personal theories, it seems sensible to suggest that collaboration might be a good way forward. The

following ideas, starting in-house and then looking outwards, each offer a form of potential 'theory building' collaboration based around a specific example from primary science.

Making the most of colleagues within school

Our own colleagues are often an underused resource, hidden behind the closed doors of the classroom. A set of common issues could be identified and staff paired up accordingly. Collaboration at this level might simply involve the swapping of solutions but could go much further. Japan in particular has led the way in the concept of 'lesson study'. In this, staff choose a focus, identify a few specific pupils, plan a lesson together and minutely observe the effects on the pupils' learning, reflecting on lessons learned at the end. The government is now promoting this approach in England and Wales (DCSF, 2008) and it seems that this could become a valuable step towards identifying wider theoretical links. Looking at children's experiences of measurement within science, and indeed across the curriculum,

might lead to an exploration of published work on common misconceptions in this field. Findings can easily be shared through brief but regular staff meeting slots.

Collaboration of this kind can easily develop into small-scale action research projects. What effect, for example, would the wider use of digital cameras have on communicating results for pupils who struggle with literacy in your classroom? *What works well* is a government online database (DfE, 2010) of case studies from schools illustrating the impact on practice of studies such as these.

Collaborating with other local teachers or science subject leaders

Working in partnership with other schools is to be applauded and it is likely that your counterparts locally will be facing many of the same issues as you. Consider the opportunities that might exist for joint ventures across schools. Teachers have a great deal of expertise in assessment within science, so how does the recent introduction in England of APP (Assessing

Pupils' Progress) for science fit in with this accumulated wisdom? Rather than simply using the new assessment foci and standards files unquestioningly, this could provide the catalyst for reconsidering practice and the materials could be evaluated at this local level. Their possible links, for example, to existing assessment for learning activities might be discussed in the light of established models from the likes of Black and Wiliam (1998).

Creating links with local secondary schools

A visit to the science laboratories of a secondary school can be an exciting event for upper key stage 2 pupils (ages 9–11) and helps to facilitate transfer between phases. Sharing ideas and practice with secondary science colleagues on a suitable ladder of process skills development would be a useful project, particularly in the absence of SATs (standard assessment tests) data. This could then be enhanced by drawing on knowledge of aspects of child development. What light do various stage theories shed on what we might reasonably expect of pupils of different ages?

An example of a collaborative approach to transition from primary to secondary school is provided by Eleanor Brodie (2010), as she describes a project drawing on ideas of cross-curricular learning in which science and history are combined.

Working in new ways with local providers of teacher education

Universities and other providers of teacher education are required to work in partnership with schools. There may be an opportunity for students to undertake a small-scale project with your pupils and, of course, the students themselves need to make these links with theory. A trial and some analysis, for example, of the use of a constructivist teaching process with groups of children in the science classroom could certainly be mutually beneficial.

Conclusion

When all is said and done, it is the interplay between 'public' and 'personal' theory that is crucial. Increased opportunities for devolving decision-making to primary teachers are emerging but as Estelle Morris (2009) has pointed out 'Devolved power must go hand in hand with an obligation to make informed decisions, otherwise we will just reinvent the wheel again and again.' By taking teachers' experiences and insights as a starting point we can make the first move within

science, ensuring that research is relevant to the everyday practice of teachers and grounded in the classroom.

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Rupert Knight is a lecturer in primary education at the University of Derby. Email: R.Knight@Derby.ac.uk

What will our Earth look like in the future?

What will live there?

A competition with the Association for Science Education and schoolscience.co.uk to win a *Future is Wild* Media Box

The Future is Wild imagines – scientifically – the natural history of the future. Its stunning CGI documentaries have won international audiences. A new documentary series is in preparation for 2011 which proposes different scenarios in the 'recent future'.

In collaboration with *schoolscience* and the ASE, *The Future is Wild* invites children aged 7–14 to imagine what the world might be like 100,000 years from now. Climate change has raised the

temperature of the Earth. The ice caps are melting and low-lying land has been flooded.

Take one animal or plant from the present day and imagine how they might evolve to survive in these changed conditions. You can find inspiration on *The Future is Wild* website: www.thefutureiswild.com, on YouTube and in *The Future is Wild*'s low-cost educational resources at www.wildgoose.ac

Each entry should be written and/or drawn on a single sheet of paper or card, no bigger than A4 (word processing and drawing programmes can be used) and sent to:

Rebecca Dixon-Watmough, Project Office, 44 St Peters Close, Salesbury, Blackburn, Lancashire BB1 9HH.

Children's original, scientifically authentic ideas – not their artwork or presentation skills and techniques – will be judged by a team from the ASE and *The Future is Wild*, with prizes for different age ranges. Please ensure the name, age and school address is on each entry.

A high-value *Future is Wild* 'media box' with a DVD, a *Future is Wild* t-shirt and other goodies will be awarded for the best entry in each age group.

The competition closes on Friday 1 October 2010.

