Primary–secondary transfer

innovative projects to ease transition

Keith Bishop and Paul Denley write about primary–secondary transfer in science and the projects that the AstraZeneca Science Teaching Trust is currently funding to support innovative programmes of professional development for teachers engaged in this process.

In recent times there has been much concern expressed about the difficulties faced by children learning science as they make their way from the primary to the secondary school. The Chief Inspector for Schools noted this in 2001 when he reported:
'In general, pupils make too little progress in key stage 3. They often start their secondary education enthusiastically, but may become disheartened if their basic skills are not firmly enough in place to make sense of all the subjects' demands or if insufficient account is taken of what they already know and can do'. (OfSTED, 2001).
Interestingly, the situation seems to have changed a little, as the recent OfSTED report on teaching in secondary science paints a more hopeful picture. The report says:
'… key stage 3 teachers are taking more account than previously of pupils' experience of science at key stage 2, an issue highlighted in previous reports, and are adapting their key stage 3 curriculum in the light of this'. (OfSTED, 2002)

Key stage 3 dip

The fact that key stage 3 teachers are beginning to take greater account of children's prior attainment is significant and, in effect, underlines the thinking behind the Trust's decision to fund projects that require an explicit key stage 2–3 focus. In the past this 'falling back' was referred to as the 'key stage 3 dip', and was presented as an apparently inexplicable form of regression resulting from children's transfer from the primary to the secondary school. To address this head-on in the context of science, the AZSTT has, therefore, been anxious to extend its previous activity supporting science at key stage 2 to address its interface with key stage 3.

In inviting proposals the Trust asked potential bidders to devise approaches that would explore, in different ways, how children's learning in science can be maintained and enhanced through the transfer process and continue to support their learning into key stage 3. In doing this, the Trust anticipated one of the four key principles underpinning the National Key Stage 3 Strategy, i.e. the principle that now requires key stage 3 science consultants to be:
'strengthening the transition from KS2 so that pupils do not fall back in Y7 and ensuring good progression in teaching and learning across KS3'.

AZSTT innovative projects

Recognising the importance of primary–secondary transfer is not new in AstraZeneca-funded projects. In fact, one of the first projects to be supported by the Trust, undertaken by Liverpool John Moores University, incorporated quite explicit phase liaison in its work with primary teachers. Although its key focus involved expert science teachers working alongside primary teachers, it also carefully linked the primary schools with their partner secondary schools through joint twilight sessions. In these sessions, teachers learnt from one another about their approaches to teaching and together took the opportunity to share experiences. The process proved highly beneficial for both primary and secondary teachers (see www.azteachscience.co.uk/trust/john.htm for further details about the project).

More recently, Bath Spa University College has been working closely with Bristol and South Gloucestershire LEAs (see www.azteachscience.co. uk/trust/bath.htm) with the explicit intention of focusing on subject leaders' use of formative assessment in the teaching and learning of scientific enquiry. One direct outcome available to all teachers is the development of a Professional Development Unit (PDU), which explains the use of Floor Books as a tool in formative assessment (see www.azteachscience.co.uk/PDU/floorbooks.htm). As a second dimension, however, the project also brought together primary and secondary schools with the support of the local LEAs. This dimension aimed at improving continuity and progression between key stages 2 and 3 by requiring clusters of primary schools to work collaboratively with their partner secondary schools. This project has had a remarkable impact in the two LEAs, such that participating primary schools are now used as models of good practice for others to follow. Secondary teachers noted the improvement in the Sc1 skills of the children from the project schools in their new intake. An LEA advisory teacher commented:
'Primary teachers involved have significantly developed their understanding of and ability to teach Sc1 skills… on the whole, the teaching of Sc1 skills has become more systematic and structured'.

Primary–secondary projects

With so much emphasis being placed on the need for effective primary–secondary transfer, the AstraZeneca Science Teaching Trust commissioned a range of specific transfer projects. The first of these is the STAY project developed at the University of York (see page 11 of this *EiS*). The key to this project is the development of

bridging units. A clear outcome is the value attached to the process of writing such bridging units and the collaboration through joint planning activities between year 6 and year 7 teachers that it spawned.

Additionally, the Trust has sponsored a number of smaller primary–secondary cluster projects, each centred on a lead secondary school collaborating with a small group of feeder primary schools. Bids were selected in order to ensure that different approaches were employed, for example:

- **Bishop David Brown School Cluster, Woking** is involved in using Edward de Bono's six thinking hats as a vehicle for developing children's thinking skills in their investigative work;
- **Audenshaw School Cluster, Manchester** is organising time for primary and secondary teachers to reflect together on their own practice, so that the secondary teachers try out ideas that can build on pupils' primary science experiences; and
- **Ecclesfield School Cluster, Sheffield** is developing and sharing 'explorer kits' of equipment that both primary and secondary teachers can use.

Pupils carrying out practical work in one of AZSTT's project schools.

Lessons learned

Across all the projects some clear lessons emerge about what makes effective primary–secondary transfer.

Firstly, there is a recognition that teachers in all the partner schools are beginning to work together for a common aim. Equally important is the feeling of trust being established between primary and secondary colleagues, i.e. breaking down barriers and entrenched ideas, rather than reinforcing a feeling of mutual wariness. In essence, the teachers welcomed the opportunities to work together, whereas once they might have struggled on alone. Getting the timing right and avoiding the reinforcement of negative ideas about secondary teaching styles is paramount.

Secondly, teachers began to recognise the expectations of their respective colleagues. In the past, secondary teachers would tend to adopt the *tabula rasa* approach and work from the basis that the incoming pupils either knew nothing or, if they did, what they knew would be so different that it would be best to start with a blank sheet. Now, secondary teachers can see that a lack of conceptual challenge in their phase risks losing pupils through boredom. On the other hand, primary teachers now recognise the importance of developing children's investigative skills to be exploited by secondary teachers, rather than pumping them with excessive content.

Thirdly, the transfer of assessment data from primary to secondary can have a significant impact on the expectations of the secondary teachers. Too often data is transferred late, is aggregated (i.e. offers no contextual or interpretive value) and leaves secondary teachers paying lip service to it. The AZSTT projects, however, offer a range of suggestions about how information (i.e. performance data and children's work) can be used by secondary teachers without overloading them, yet still be sufficiently detailed to inform their planning and allow them to build on what year 7 children have already covered and achieved. In essence, transfer information must be meaningful and useable.

Fourthly, children's expectations and perceptions of transfer from primary to secondary education are an important consideration. Traditionally, children expect to leave behind the old, make a fresh start, enjoy the higher status of the 'big school' and do 'proper science'. Indeed, they still expect this, and we should not necessarily deny them some encounters with curriculum discontinuity. However, to ensure that children develop a sense of curriculum coherence within science, they need confidence that there will not be total disjunction in their pedagogical experience.

Finally, a key feature of all the projects was a realisation that change in practice in both key stages was essential if children were to experience some degree of pedagogical continuity (see below). This includes a recognition that it is possible for children to cope with quite different content (i.e. as they often come from a disparate variety of feeder schools), so long as the approach to learning and teaching bears similarities across phases. It is necessary, for example, to be explicit about the extent and nature of both conceptual and procedural progression. Progression across the phases then has a real chance of occurring by overcoming the different pedagogies of primary and secondary science.

Bridging units

A tangible outcome from both the Bath Spa and the York projects was the development of bridging units. Bridging units are also a feature of the numeracy and literacy strands of the Key Stage 3 Science Strategy as an

attempt to establish curriculum continuity across the key stages.

Although bridging units might be thought by some to be a panacea to the transfer problem, evidence from the AZSTT projects suggests that they should not act as substitutes for a range of complementary approaches. Crucially, it is the involvement in the process of bridging unit development that is so important if key stage 2 and 3 teachers are to move towards changing, and ultimately harmonising, their respective pedagogies. (See Galton, 2002 for a critique of the use of bridging units.)

Towards pedagogical continuity

The concept of pedagogical continuity is about harmonising practice across the key stages. Essentially, this relates to how teachers think about their own teaching and the impact they have on children's experiences of learning in the different phases. Galton (2002), writing about children's attitudes towards science in the *Cambridge Journal of Education*, makes this point:

'... the means of improving attitudes to science, both before and after transfer, has less to do with changing the curriculum and more to do with the way the existing curriculum is taught'.
(Galton, 2002, p. 264)

We see considerable evidence from AstraZeneca projects to support this contention and would strongly support the view that *'the solution* (i.e. to primary–secondary transfer) *has more to do with a shift in pedagogy rather than further changes in the curriculum'.*
(Galton, 2002, p. 249)

Although the focuses and approaches adopted by the various projects were very different, this analysis reflects the most important message emerging from the primary–secondary projects sponsored by the AstraZeneca Science Teaching Trust; that is, it is teachers collaborating, sharing and reflecting jointly on experiences of teaching and learning in science that are most likely to lead to pedagogical change and a consequent increase in harmonisation.

Where to next?

The AstraZeneca Science Teaching Trust plans to continue supporting professional development at the primary–secondary interface and will soon be devoting a new important section of its website to research and development in primary–secondary transfer in science.

The AstraZeneca Science Teaching Trust website can be found at: www.azteachscience.co.uk

References

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