**SMART KIDS –**

**ENHANCING SCIENCE LEARNING WITH PUPIL–PUPIL COACHING**

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**Mick Dunne (MD):** What is the Smart Kids project?

**Michelle Proctor (MP):** The project was designed by Dr Lynne Bianchi and Penny Thompson at the Centre for Science Education, Sheffield Hallam University. It aimed to develop pupil coaching partnerships at key stages 1 and 2 (ages 5–11). We were hoping to enhance the review and reflection children undertook about their science learning and to provide them with some structures. This followed work we had done as staff on the use of collaborative coaching in the Smarter Schools project the year before (see Websites). We really wanted to see whether the skills that we as staff are using in coaching, could be mirrored in some ways by the children we teach, so that they became better at understanding their learning about science but also about their own personal skills and capabilities.

**MD: How did you become involved in the Smart Kids project?**

**Ruth Birtles (RB):** Both our schools are part of a wider federation called the Yewland’s Family of Schools. We have been involved in the Science Specialism Pilot (see Websites) with the Specialist Schools and Academies Trust for a few years, which means science education has a high priority. We are always looking for innovative and creative opportunities to raise attainment in science and across the curriculum, so the Centre for Science Education approached us to be involved in Smart Kids.

**MD: What was your role within the project?**

**RB:** We had to identify and provide opportunities within our school context to equip children with the skills of coaching, so they could reflect in a semi-structured way on their science and skills learning. The term ‘coaching’ was used initially but later it seemed more appropriate to simply tone this down to considering what good reflective talk sounded like.

**MD: How did you go about the project?**

**MP:** The project team suggested we find time within the curriculum, during lesson plenaries, to encourage children and teach them the reflective skills. For me, this didn’t work well: I had a whole class of year 1 children (ages 5–6) and working with a smaller number felt more appropriate. So, having set up a Science Golden Time club, which involved year 5 children (ages 9–10) teaching my children science activities, I felt this would be a good opportunity to incorporate some of our ideas. One strategy that we had used was the GROW approach (Box 1) and I decided to allow children to reflect and talk about their science learning with this as a basic structure.

**RB:** As a year 2 (ages 6–7) teacher, my approach was first to develop a framework for children to ask questions, so that they could reflect on their learning together. I wanted the children to be able to ask themselves and others questions about their learning, but I found that this skill needed teaching itself before anything else could happen. So I began by modelling good questioning and listening skills through games, which were then developed into resources by the project team.

**MD: What were your expectations?**

**MP:** I hoped my year 5 children would develop their skills in asking open-ended questions to aid
reflection and I wanted my year 1 and 2 children to be able to talk about their own learning and begin to use some self-assessment. Then they could start considering what steps they needed to take to further their own learning, particularly in science exploration activities. I wanted them to be confident about talking about their thoughts and ideas and their ability to ask and answer questions.

RB: I expected that my class would develop questioning skills which would then allow them to come up with their own ideas for engaging in practical science activities. I also wanted them to develop speaking and listening skills in science but also across the curriculum, so that they were better able to reflect on their learning and to identify their next steps.

MD: Has anything interesting emerged from the project above and beyond the main activity?

RB: Yes, in fact the whole group of teachers involved in the project looked closely at the skill of ‘reflection’, which is part of our family of schools’ Skills for Learning framework. It links to the Personal Capabilities that Sheffield Hallam University work on, so it drew on all our areas of expertise. We broadly unpicked what this meant for us as a group, from working with younger children in years 1 and 2 to older children in year 5. What we have come up with is a type of progression which shows how we think children’s development of reflection might take place over time, as a six-step scale (Figure 1). We are not sure whether we have got this totally right yet, but it pulled all our ideas together and does include coaching skills that we set out to develop.

MD: What was the impact on the pupils?

RB: The children’s use of questions has definitely improved and they can now use question stems confidently to ask scientific questions. The more confident children in my class use ‘question fans’ as a physical question prompt to ask each other about their learning and to identify their next steps (Figure 2). Much of the early time with year 2 is spent developing basic speaking and listening skills, something that must be in place before they can engage effectively with more refined coaching-type experiences.

MP: Some of the year 5 children found coaching quite daunting when we introduced it and it seemed to take much of the fun away from the

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**Box 1 The GROW approach**

The GROW approach (Whitmore, 2003) provides a structure of coaching sessions, which consists of four key question groups:

- **Goal:** What are you going to do? What is your goal for this lesson?
- **Reality:** What equipment have you got? What do you need? Who could help you? What help might you need?
- **Options:** How are you going to do it? Is there another way to solve the problem? Which way do you think is best?
- **Will:** What will you do next? What do you predict will happen? What can I do to help?

**Figure 1 The six-step scale to aid children’s development of reflection**

**Figure 2 Children using ‘question fans’ to support their questioning skills**

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**Our Ladder of Reflection**

1. I talk to my teacher about things I enjoy.
2. I listen carefully and I tell others what I know.
3. I think about what I have done and what next steps come next.
4. I give myself feedback and reflect on what I have done.
5. I talk about my progress.
6. I decide what I am going to do next.

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**Developing Self-assessment, with Our Ladder of Reflection**

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**Figure 1** The six-step scale to aid children’s development of reflection

**Figure 2** Children using ‘question fans’ to support their questioning skills
science activities, especially because it is in their Golden Time. They were concerned about not following the ‘correct’ coaching structures that we had suggested. I therefore told them to forget being a coach, taking the word from our conversations. I concentrated on getting them just to ask thought-provoking, open-ended questions, not to tell the younger children the answers, but to try to get them to find out more for themselves. This seemed to work better. Along with other impacts (Box 2), it was particularly noticeable that the younger children became better able to identify their next learning goals. Another important outcome was that the children were able to transfer their improved communication skills gained in science to other areas of the curriculum. It was pleasing to see the younger children being more comfortable when talking to older ones.

MD: How did the project influence your own professional practice?

RB: I realise the importance of developing speaking and listening skills, which help children to have a greater role in influencing their own learning as they generate better questions for themselves. It has helped me to develop my use of Assessment for Learning (AfL) and to be better at listening to children’s responses and seeing how they really feel about their learning. I now look, and plan, for more opportunities for children to talk to each other and reflect with their peers.

MP: This project has allowed me to think about the types of practical science activities I give to the children, favouring those that give scope for more exploration, thinking, talking, asking questions and making genuine decisions. I feel it is important for science practical tasks and activities to be more open ended, as these promote more valuable types of pupil talk. My approach to AfL has been extended through recognising the value of pupil talk as a means of gathering assessment information.

MD: Where next?

RB: Realistically, now that the project funding is over, I will be looking to use the best of what I have done and learnt from the rest of the group. I think I will keep encouraging children to reflect on learning through speaking and listening activities – that will mean me modelling the language of self-reflection and helping the children to develop theirs. I think there is a lot of value in simple game-type activities, such as the question-headband game, in which symbols, words or images are placed on a headband and the child wearing it asks questions in order to identify what their headband shows. These were great at encouraging children to get involved and to practise asking questions. I would like to plan more opportunities for them to talk to each other, rather than focusing on just talking to me!

MP: I have seen real benefits emerge from the work done and aim to continue to build on some of these developments. I am particularly keen to develop further the younger children’s confidence in, and capacity for, speaking and listening by extending the range of science activities that they meet. Having older children support younger ones is something that I intend to hold onto and develop. We have some very young children in the Early Years unit who are reluctant speakers; one of the exciting possibilities will be to look at using older children to mentor them in such a way that their confidence improves as well as their reflective talk.

Acknowledgements

Thanks to all the teachers involved in the Smart Kids project and to the project funders for their support. For more information email: l.m.bianchi@shu.ac.uk or penny.thompson@shu.ac.uk.

Reference


Websites

Smarter Schools: www.personalcapabilities.co.uk/smarter_schools
Science specialism pilot: news.bbc.co.uk/1/hi/education/6230584.stm

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