Making thinking visible in the primary classroom

Action research in South Wales has proven it's never too early to teach children how to think. Researchers **Russell Grigg** and **Helen Lewis** report on the strategies uncovered to extend and deepen pupils' thinking – even at a very young age.

Teachers often use the word 'thinking' in everyday discussions. They ask pupils to 'put their thinking caps on', 'think hard', think about it' or 'think it through'. Unfortunately, there isn't a common view as to what we should expect from our pupils. What is 'good' thinking? Can we teach primary-age children how to improve their thinking, or does this skill develop naturally? If we want to promote thinking, what are the key elements of effective practice that our provision should include?

In 2010, a small group of teachers and university staff in South Wales formed a professional learning community (PLC) to find out.

Why a professional learning community?

The Welsh Government describes PLCs as groups of practitioners exploring an aspect of teaching to improve learning and teaching outcomes.[1] Research shows that teachers who are part of a PLC tend to be more effective in the classroom and achieve better student outcomes than those who work alone.[2]

For the teachers in our PLC, the aim was to develop simple, effective strategies to promote thinking in their classrooms, and also hone their personal teaching skills. The teachers taught in Reception, Year 1 and Year 2 in six different schools, and the variation in teaching experience was considerable – from four to 20 years! Yet, despite their differences, the group settled on a shared focus of exploring the use of the Harvard Project Zero's Visible Thinking approach to improve the quality of pupils' thinking skills (www.visiblethinkingpz.org).

> "For the teachers in our PLC, the aim was to develop simple, effective strategies to promote thinking in their classrooms, and also hone their personal teaching skills."

The logistics of the project involved the release of each teacher for eight days throughout the year to work with a university tutor. The university tutor also visited the teachers in their classrooms to work alongside them. Helpfully, the schools had prioritised the development of pupils' thinking within their improvement plans and earmarked appropriate funding from their school budgets.

But before the PLC could begin finding ways to improve pupils' thinking skills, we first had to settle on what we meant by 'thinking' and decide what we could reasonably expect young children to be able to do.

What is 'thinking'?

We agreed that thinking is a process helping us to make sense of a situation. It is something we all do – sometimes quietly, sometimes aloud and sometimes poorly when we acknowledge that 'we weren't thinking straight'. As we think, we might question or review the subject, make links or see new possibilities. In other words, we might think in critical or creative ways.

That settled, our next step was to consider what characterises good thinking. Wegerif acknowledges that not all thinking is good, defining good thinking 'as the thinking that we want to see more of'[3]. He likens thinking to an inner dialogue – a tension between two or more ideas that drives criticism, insight and creativity. This dialogic theory sees thinking as a process of exploring different perspectives. It underpins such approaches as Philosophy for Children with its emphasis on reasoning and collaborative thinking.

Good thinkers have well-developed skills to solve problems, analyse material, argue a case, weigh up differences and reach informed conclusions, but they also have the inclination to use these skills. Hence, writers refer to the importance of cultivating dispositions to good thinking, such as the tendency to be open-minded, explore, wonder, set goals, evaluate and reflect. We introduced the PLC group to the work of Art Costa and Bena Kallick who promote 'habits of mind' such as questioning, thinking flexibly and creating, imagining and innovating.[4]

Making good thinking a habit

Over the last decade or so, there has been no shortage of projects, government-funded research, and programmes designed to promote effective thinking in school. This includes the Visible Thinking approach, which advocates the use of Visible Thinking Routines (VTRs) to extend and deepen thinking.

VTRs are flexible, powerful yet simple mini strategies that can be woven into everyday classroom life. Each routine is aimed at developing specific thinking processes, such as making connections or comparisons, providing explanation, considering different perspectives or justifying an opinion. The routines provide structure and help make the specific thinking process visible to all.

For example, one of the core routines is 'see, think, wonder', which is used to explore works of art, images, artefacts and other interesting things. In this routine, pupils are asked (or ask themselves): What do you see? What do you think about that? What does it make you wonder? This encourages students to make careful observations and thoughtful interpretations, and stimulates curiosity. One of the ways Project Zero recommends using this VTR is at the beginning of a new unit to motivate student interest. You can view and download other thinking routines from www.visiblethinkingpz.org.

To become 'routine', the VTRs need to be used frequently, and the intention is that children will use them quickly and almost automatically (for example, rattling off 'I see… I think… I wonder…' without external prompting). Once familiar and well-known, routines can be transferred to situations beyond the classroom, and applied to many aspects of daily life.

The 'thought-full' classroom

The literature on thinking skills reveals many differences over what is meant by thinking, what 'good' thinking looks like in practice, whether it can be taught separate to knowledge, and how it can be assessed. Monitoring and assessment of thinking development is complicated by the fact that young children may lack the language capability to tell us what they're thinking about, and how they're thinking about it. Often practitioners can only make a best guess as to the thinking that is going on.

Despite these challenges, there is broad consensus over the kinds of practices that promote 'thought-full' classrooms. These include:

- providing challenging tasks – what Adey and Shayer refer to as 'cognitive conflict'[5], whereby teachers set activities that are just beyond pupils' current

capabilities but, with appropriate support from the teacher and more able peers, stretch the mind
- sharing thinking vocabulary in everyday conversation and displays – e.g. 'sort', 'reason', 'predict', 'connect'
- encouraging curiosity where learners are not worried about making mistakes – e.g. asking questions, trying things out, taking risks
- providing opportunities for purposeful dialogue – e.g. through role-play scenarios, group projects or real-life investigations
- using a range of purposeful questions and prompts – e.g. Can you say what you now think/know? What do you want to find out? Why are you doing this? Would you do things differently next time? Why?
- using a range of written and audio-visual resources to stimulate thinking
- modelling thinking strategies and dispositions – e.g. 'thinking aloud' when working through problems, asking 'why' questions, the disposition to wonder and be adventurous.

Everything we learn takes place in a social and cultural context, and children's understanding of the world develops as they handle things, play with friends and interact with teachers. So, for example, although problem solving is something that is carried out 'in the head', it can be improved through interactions with critical friends, teamwork, group projects, mentoring and using cultural tools such as the internet, books and language.

Sometimes social learning can reinforce negative thinking – for example, if children learn prejudicial views or a poor work ethic from a group. Tishman et al. point out that teachers need to 'enculturate students into good thinking'.[6] In such classrooms, teachers encourage pupils to speculate, challenge, and seek explanations. A thinking culture is created when pupils learn to value evidence and where thinking is named, noticed and celebrated. Classroom displays might include posters of thinking in action, such as a girl with a thought-bubble above her head showing her reminding herself to stand back. Adults might also model how they go about tackling problems, sharing their thoughts aloud, while also drawing on exemplars from the world of scientists, historians or artists.

"A thinking culture is created when pupils learn to value evidence and where thinking is named, noticed and celebrated. Classroom displays might include posters of thinking in action, such as a girl with a thought-bubble above her head showing her reminding herself to stand back."

The teachers in this project felt that, with the wealth of materials available to use in the classroom and the number of initiatives and priorities that teachers face, many of these underlying principles had been forgotten. They saw this project as an opportunity to stand back, reflect upon their practice and then refocus on key aspects of good teaching.

Why it's important to talk

The relationship between language and thought has occupied many theorists. Famously, Piaget considered that thought preceded language, while Vygotsky suggested both processes were interdependent.

There is evidence that certain groups of children can access the educational process more successfully than others. Children possess 'cultural capital', which to a greater or lesser extent allows them to make sense of, and interact with,

classroom practices. Evidence has highlighted, for example, the importance to a child's cognitive development of a home learning environment where parents talk, sing and read to their child. This can account for a 12 per cent gap in development by the age of five between the richest and poorest children.[7] Talk is a powerful way of developing understanding, because it allows the learner to organise and adapt what they know. Barnes described this kind of language as 'exploratory talk', where the speaker is hesitant, mulling over the meaning of what they are doing, trying out ideas and arranging information into different patterns.[8] Sentences may be unfinished, broken, and full of ums and ahs, but scientific studies show that these so-called 'disfluencies' help young children predict which words to pay attention to.[9] The implication for practitioners is to ensure that young children have the opportunity to talk purposefully without interruption, fear of being made fun of, or being contradicted.

Unfortunately, Barnes points out that much of the talk teachers expect from children is of a 'presentational' type, where the emphasis is on getting it right and using the appropriate form of speech. Children need to feel at ease in discussions, but they also need to learn to justify what they say and get into the habit of making their reasoning visible in their talk. Enabling children to talk in a variety of situations and contexts is key to the development of thinking skills.

The role of metacognition

The concept of 'metacognition' is frequently mentioned in the literature on thinking skills. The Greek prefix meta (meaning 'beyond') has come to refer to something that transcends the subject it is related to; thus, metacognition involves both the 'what' and 'how' of thinking.

The term was first introduced in the late 1970s to mean 'thinking about thinking'. Subsequent writers have suggested that this involves awareness, control and knowledge of one's own thinking. Bruner was interested in getting students to reflect, to turn around on themselves, to go 'meta' or 'to think about their ways of thinking'.[10]

Metacognition is important because it is central to learning. It enables pupils who have been taught a particular strategy in a given context to retrieve and deploy that strategy in a similar but new context. In effect, metacognition is like an in-built quality control system, with the learner adopting a self-questioning approach and asking themselves: Do I know this? What does this mean? Am I on the right track? What can I do next?

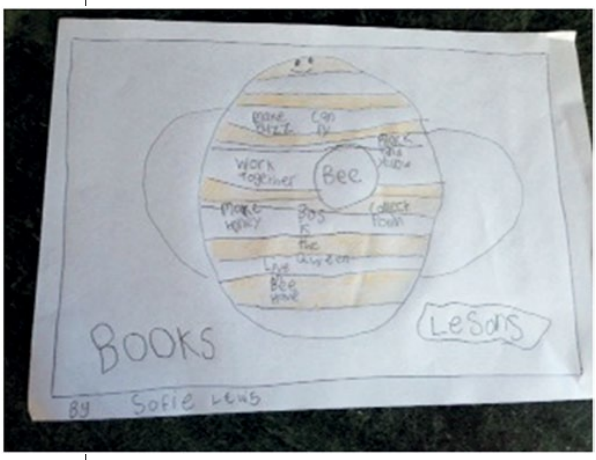
Activities such as planning how to approach a task, and monitoring and evaluating progress toward completion are metacognitive in nature. In this project, we saw the promotion and celebration of metacognitive skills as crucial in promoting effective teaching and learning experiences. Self-reflection was an important activity for teachers, children and the university staff throughout the project.

Getting a picture of pupils' learning

One of the challenges when researching young children's thinking is determining the extent to which they are able to express their thoughts and how this can be evidenced. Put simply, we cannot see into children's minds.

To help circumvent this issue, the PLC teachers made use of a technique called video-stimulated reflective dialogue (VSRD). VSRD is based on the use of short video episodes to stimulate discussion between researcher and participant. Previous studies have also shown that secondary school students can offer insights into their learning when using this method.[11] Our study focused on working with five and six-year-olds to take ownership in identifying, capturing and discussing episodes of thinking for themselves. The children were asked to make a video of one to two minutes in total, which then formed the basis of the reflective dialogue. It was felt that giving children ownership of the process would encourage participation and involvement.

This allowed children's thoughts to be captured in ways other than verbal interaction. Children will often use gesture and other non-verbal forms of expression when they try to explain their thinking, and this can convey a deeper



level of understanding than words. The Reggio Emilia Approach highlights the phrase 'the hundred languages', suggesting that children need the opportunity to express their ideas and thoughts in many different ways. Teachers should therefore listen and observe students carefully and not just reflect on the overt demonstrations of learning that are evident.

Using video for teacher reflection

It is challenging for teachers to improve their practice if they are unaware of the aspects that require improvement. The project also therefore considered whether VSRD could help teachers in their professional development. The teachers filmed themselves teaching a VTR activity, before selecting a short section of the film to reflect on with the university tutor.

Initially, the teachers were reluctant to watch themselves on screen and tended to focus on the 'negatives' of their teaching (and appearance!). However, once they got over this, they appreciated the power of VSRD to aid evaluative skills, especially when reviews were undertaken jointly with a colleague. They were able to pick up on the nuances of classroom interactions, including children's non-verbal gestures and spatial positioning within a group. One participant, when reflecting on the value of being able to revisit different aspects of lessons, said: 'The dynamics of the group, the confidence and wellbeing of the pupils… body language is so easily missed. Realising the quiet child is actually thinking and is not disengaged was a eureka moment!'

In terms of teaching, the participants focused on their own language model and the balance between adult and child talk. In short, they recognised that they talked too much on some occasions and needed to sharpen their questioning skills. They also realised how often they used the word 'think' rather than specific terms such as 'connect' or 'explain'. As one teacher put it, she needed to allow the children time to talk and answer their own questions.

What were the overall benefits?

The participating teachers identified a wide range of gains from the project. Personally, they felt they were motivated to undertake further research in the classroom context, and noted an increased understanding of children's cognitive development. They also felt they had developed greater consistency in planning and teaching with various pedagogical tools, and appreciated the opportunity the project had given them to share ideas with other teachers and become more self-critical.

Furthermore, the teachers gained a better understanding of the key concepts underlying effective teaching of thinking, such as making connections or explaining reasons, and were therefore able to make use of other materials, such as the six thinking hats or thinking maps, consistently and with confidence to develop such skills. Specific aspects of thinking became more visible in their planning.

The children, meanwhile, began to use thinking strategies with increasing confidence, awareness and independence. The opportunities the project afforded them to review and reflect on their learning resulted in a greater awareness of what thinking is and what it means to be a 'good' thinker. Teachers also mentioned increased pupil confidence and an extended vocabulary.

There were gains for specific groups of learners too. As one teacher explained, 'the "talkers" became calmer and less demanding of the children who take longer to contemplate silently. They were therefore able to form and share opinions, while allowing others to disagree without conflict.'

The teachers also used the video-recorded sessions with the children, inviting them to spot obstacles to their learning. One teacher noted: 'The children loved watching the video, and this proved very successful, as they were constantly

discussing where they felt there was good thinking and would conclude what the barriers were. They came to their own conclusions that "hands up" stopped them listening and joining in.'

The children thoroughly enjoyed taking responsibility for filming aspects of good thinking in their classes. Even the five-year-olds in the project were able to master the technology, and the resulting films gave both teachers and children a deeper insight into the nature of thinking in their classes. This offered opportunity for discussion and celebration of good models across the entire school.

One school used the thinking routines as a basis for a parents' day – whereby parents and carers were invited in to find out more about the work going on in school. VTRs proved to be exciting and accessible activities for children to explore with their parents in this context.

The project has the limitations of a small-scale piece of action research. The participating teachers were all interested parties, and it is difficult to generalise from their experiences. However, the project has shown that the use of VTRs has sharpened teachers' questioning skills and language model, with the language of thinking assuming greater prominence in the classrooms. The opportunity to watch episodes of teaching and learning also helped teachers and children understand better the nature of thinking, and what makes 'good' thinkers. Above all, though, the project has raised questions in the minds of teachers about their role and taken-for-granted practices.

Dr Russell Grigg was Head of the South West Wales Centre of Teacher Education (SWWCTE) until May 2014. He is an experienced teacher, inspector, lecturer and education consultant and is the author of numerous publications.

Helen Lewis is the Primary PGCE lead at the SWWCTE, and an experienced teacher, education consultant and lecturer. She has a particular interest in thinking skills in the early years, and has studied at Project Zero, Harvard University.

References

1. Welsh Government (2013). Professional Learning Communities. [online] Available at: learning.wales.gov.uk/docs/learningwales/publications/130830-plc-guidance-en.pdf [Accessed 06/03/2015].
2. Lewis, M. and Andrews, D. (2004). Building sustainable futures: emerging understandings of the significant contribution of the professional learning community. Improving Schools, vol. 7(2), pp.129-150.
3. Wegerif, R.(2010). Mind expanding: Thinking and creativity in primary teaching for education. Berkshire: Open University Press.
4. Costa, A.L. and Kallick, B. (2000). eds. Activating and engaging Habits of Mind. Alexandria, VA: ASCD.
5. Adey, P., and Shayer, M. (1994). Really raising standards: Cognitive intervention and academic achievement. London: Routledge.
6. Tishman, S., Jay, E., and Perkins, D. (1992). Teaching thinking dispositions: From transmission to enculturation. Harvard Graduate School of Education. [online] Available at: learnweb.harvard.edu/alps/thinking/docs/article2.html [Accessed 06/03/2015].
7. Field, F. (2010). The foundation years: preventing poor children becoming poor adults. London: HM Government.
8. Barnes, D. (1976) From communication to curriculum. London: Penguin. http://www.newscientist.com/article/mg21028095.800-baby-brain-expert-ums-and-ers-help-children-learn.html
9. George, A. (2011). Baby brain expert: 'Ums' and 'ers' help children learn. NewScientist [online] 28 April. Available at: www.newscientist.com/article/mg21028095.800c-baby-brain-expert-ums-and-ers-help-children-learn.html#.VP1sDfyDnTo [Accessed 09/03/2015].
10. Bruner, J. (1984) Notes on the cognitive revolution. Interchange, vol. 15(3), pp.1-8.
11. Tanner, H. and Jones, S. (2007) Using video-stimulated reflective dialogue to learn from children about their learning with and without ICT. Technology, Pedagogy and Education, vol. 16(3), pp.321-335.

Knowledge trails

1. **Thinking skills in the early years –** What thinking skills are children able to demonstrate at an early age? Kate Ridley reports.
   library.teachingtimes.com/articles/thinking-skills-in-the-early-years

2. **Thinking skills approach to our days –** Marcelo Staricoff and Alan Rees use thinking skills to transform learning at Westbury Park Primary School.
   library.teachingtimes.com/articles/thinkingskillstourdays