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Tools for inquiry

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Section II

Approaches to teaching thinking
Introduction

Understanding pedagogy requires sustained engagement with practice in order to create the ‘thick description’ (Geertz, 1973) necessary for the capture of complex interactions between teachers and their students. It is difficult for an external researcher to do this without compromising the authenticity of the context and even if it were possible, without access to the thinking of the participants ‘in the moment’ that the activity is taking place, understanding will be incomplete. It was reasoning along such lines that led John Dewey to propose the development of pedagogy as theory in which teachers are recognised as the creators of pedagogical knowledge and the dichotomy between researcher and researched, theory and practice is denied. In the UK, Lawrence Stenhouse took up this idea and advocated a model of curriculum development in which the teachers created knowledge by testing academic proposals in action in their classrooms. Both Dewey and Stenhouse understood teaching to be an uncertain process in which largely tacit knowledge is gained through experience and the tendency towards conserving order stifles creativity by closing down options. However, positioning teachers as researchers helps their practice to become visible, open to critique and susceptible to change, thus enabling them to make a significant contribution to the improvement of education:

it is not enough that teachers’ work should be studied: they need to study it for themselves. What we need is a different view of research which begins with our own work and which is founded in curiosity and a desire to understand; which is stable, not fleeting, systematic in the sense of being sustained by a strategy.

(Stenhouse, 1995, p. 1)

Since the 1970s there have been further attempts to develop pedagogy as theory and promote a ‘different view of research’. In the UK, for example, initiatives have focused on supporting evidence-informed practice through collaborative partnerships between teachers and researchers (Baumfield, 2001; McLaughlin et al., 2006); similar trends can be seen in the US (Cochran-Smith and Lytle, 2004), Australia (Mockler, 2011) and the Netherlands...
Embedding inquiry in the daily practice of all teachers is difficult and sustaining collaboration beyond the initial funding of a project is a challenge. Success requires not only the means to generate interest in engaging in inquiry into practice but also easy access to viable methods for investigation. It is argued in this chapter that teaching thinking provides the tools for the integration of inquiry into the everyday practice of teachers and so promotes pedagogy as theory.

**Brief historical overview**

By the 1990s advances in the study of cognition were stimulating interest in the possibility of using thinking skills approaches to improve learning, and the number of programmes proliferated. Whilst the authors of programmes made enthusiastic claims, there was a lack of evidence to support them and a number of reviews of research were commissioned. The American Philosophical Association convened a group of 46 scholars from a range of academic backgrounds, social scientists and scientists as well as philosophers, to examine all the available evidence and report on the role of teaching thinking in educational assessment and instruction. The final report confirmed the importance for learning of stimulating inquiry and dialogue without endorsing a particular programme:

> After decades of relative neglect, the eighties witnessed a growing accord that the heart of education lies exactly where traditional advocates of a liberal education always said it was of inquiry, learning and thinking rather than in the accumulation of disjointed skills and senescent information.  
> *(Facione, 1990, p. 1)*

Dutch researchers compiled an inventory of the programmes being implemented in Europe and also found evidence for a positive contribution of thinking skills to the education of young people (Hamers and Overtoom, 1997). Case studies from the different countries indicated that changes in the attitude and behaviour of the teachers when using a thinking skills approach made a significant contribution to their efficacy. For example, an account of an infusion approach to teaching thinking in Portugal reports the following teacher qualities:

- Improved awareness of the failures registered in their communication with learners  
- Greater self-confidence and assurance  
- Identified deficits in their pre-service training and had the resolve to overcome them  
- Greater sensitivity to the complexity of learning processes with a focus on improving the outcomes  
- Acquisition of the habit of using the communication skills featured in the programme in other aspects of their teaching and out of school contexts  
- Enthusiasm and empathy for further learning through an action research cycle.  
> *(Valente, 1997, p. 286)*

In the UK, a report commissioned by the Department for Education and Employment (now the Department for Education), identified three main types of approach to teaching thinking skills: generic thinking skills programmes taught independently of specific subject content; subject enhancement programmes with exercises provided as an additional ‘bolt-on’ element; and infusion approaches in which thinking skills strategies permeate subject content (McGuinness, 1999). The report concluded that whilst there was evidence of a generally positive effect on
learning with some common core concepts across programmes, there was no consensus as to the theoretical basis for teaching thinking, and each approach was found to have both advantages and disadvantages. Consequently, the Department for Education and Employment issued instructions for the provision in the curriculum of opportunities for students to develop their thinking skills but the type of programme and mode of teaching was left to the discretion of individual institutions.

In 2004/05 a group was established to undertake a series of systematic reviews of research on thinking skills interventions to evaluate the weight of evidence and develop a better understanding of the factors determining a positive impact. The first review focused on the empirical evidence for the impact of thinking skills on student learning and included studies conducted across all phases of formal schooling. The review pinpointed support for teachers in the management of productive classroom discourse as a significant characteristic of their success (Higgins et al., 2004). Building on this evidence, the second review conducted a meta-analysis comparing the effect sizes for the different types of thinking skills interventions to assist policy makers and practitioners in making evidence informed decisions as to which programme or approach to adopt. This review confirmed the impact on pedagogy of thinking skills interventions by demonstrating not only how they encourage student inquiry but also how access to enhanced feedback from the learners stimulated teachers to engage in pedagogical inquiry (Higgins et al., 2005). Given the prominence of pedagogical inquiry in the outcomes of both previous reviews, the final systematic review in the series focused on the weight of evidence for the impact of teaching thinking skills on teachers. Whilst there were fewer empirical studies focusing directly on the impact on teachers as opposed to learners, there was sufficient evidence to endorse the pivotal role of thinking skills interventions in changing the structure and quality of classroom interactions. Notably, changes in the pattern of participation as teachers speak less and students take a more active, participatory role. The classroom conversations become more natural with greater use of open-ended questions and a higher proportion of exploratory talk creating opportunities for teachers to transact understanding with their students. Consequently, teachers were found to be more skilled in evaluating the ability of their students and more sophisticated in the planning and management of group work activities. The affordance given to teachers to learn more about how their students are thinking also meant that they were more willing and able to engage in formative assessment for learning. As was the case with the two previous reviews, discerning the merits of particular thinking skills programmes was difficult. What did emerge however, was that it was not so much the type of programme as the way in which it was implemented that was significant:

> technicist, delivery models that pursue faithful implementation at the expense of teacher experimentation and evaluation reduce the effectiveness of the intervention in terms of student impact.

(Baumfield et al., 2005)

Further weight is given to the importance of the impact of the use of a thinking skills approach on the experiential learning of teachers and their motivation to engage in collaborative professional development by researchers working in diverse contexts. A teacher in Scotland describes her experience as, ‘like putting a giant magnifying glass on your teaching methods/subject content. You see it as it really is – and in most cases you change your approach’ (Kirkwood, 2005, p. 159). Howie (2003, 2011), working with Maori teachers in New Zealand using Feuerstein’s Instrumental Enrichment programme, reports how teachers became aware of problems in their teaching method but at the same time felt confident about developing the skills to find a
solution. Robson and Lin (2004) found that thinking skills interventions challenged Chinese teachers’ concepts of effective teaching and learning and stimulated a re-evaluation of their practice. However, this was a gradual process requiring external support in the initial stages, but once the practice was established, teachers formed their own local action research networks to sustain the embedding of critical reflection in everyday practice.

We conclude the historical overview by looking at three projects that help us to understand the dynamics of the relationship between the experience of using a thinking skills approach and teachers’ professional learning. In the USA, the Cognitively Guided Instruction (CGI) programme for the teaching of mathematics to young children encourages children to make their problem solving processes explicit and accessible to modification by the teacher. Opening up the students’ thinking in this way gives the teacher access to the responses of the students in the lessons. These frequently exceed the teachers’ expectations of their capability, triggering pedagogical inquiry through what has been described as the ‘wow factor’: ‘I’ve learned a lot just from listening to some of these kids. I’m thinking, WOW, I never figured it out that way’ (Franke et al., 1998, p. 78).

The aim is to turn the classroom into a ‘learning laboratory’ in which teachers and researchers work together to understand children’s mathematical thinking in a partnership based on mutual respect for different but complementary areas of expertise: ‘We tried to communicate that they had certain unique knowledge and so did we’ (Fennema et al., 1996, p. 408). Teachers involved in CGI exhibit an upward trajectory of professional development sustained by their interest in what is happening in their classroom through a process of ‘self-generative change’. However, a longitudinal study found that not all teachers follow the same trajectory – for some trying out the approach and confirming that it worked was sufficient and they did not question why it was effective (Fennema et al., 1996; Franke et al., 1998). It seems that whilst CGI has the potential to engage teachers in inquiry, reaction to classroom experiences may not be sufficient in the long run as the meaning that the teacher constructs also plays a part.

In England, a school–university research partnership focusing on the infusion of thinking skills into the curriculum, the North East School Based Research Consortium (NESBRC), also provides evidence that thinking skills approaches have a ‘mirror effect’ (Wikeley, 2000) whereby an intervention designed to stimulate students to inquire and reflect on their learning has a similar effect on their teachers. As with CGI, teachers were pleasantly surprised by student responses that exceeded their expectations and disrupted the flow of the classroom routines. However, the teachers did not feel vulnerable or defensive and this state of ‘positive dissonance’ stimulated them to reconnect with their practice in search of a better understanding of pedagogy (Baumfield, 2006). Working in partnership with colleagues from the university allowed this search to go beyond their immediate context to incorporate evidence from a range of sources, including academic research. In time, this willingness to pursue ideas led to the erosion of traditional divisions between theory and practice (Baumfield and McGrane, 2001). The sharing of experience between teachers within and across the schools in the consortium was important in sustaining the conditions conducive to classroom inquiry, as was the commitment of school leaders.

Activating Children’s Thinking Skills (ACTS) was developed in Northern Ireland as a method for teaching thinking skills in primary schools. ACTS uses an infusion approach, in which the goals of teaching thinking and of understanding a specific topic are pursued simultaneously, to develop learners’ ability to become pro-active about their learning in terms of planning, monitoring and appraising their thinking. ACTS was the focus of a three-year project, ‘Sustainable Thinking Classrooms’, funded by the Economic and Social Science Research Council’s Teaching and Learning Research Programme (TLRP). Sustainable Thinking Classrooms had three strands of investigation: an evaluation of the impact of an infusion approach on children’s thinking and learning; identification of the features of classroom dialogue likely to mediate the
development of metacognition; and the design of a professional development programme for teachers that would support longer term strategies for sustaining thinking classrooms.

ACTS confirmed ‘proof of concept’ by demonstrating that an infusion approach to developing children’s thinking across the curriculum can be successful in terms of both student learning and teachers’ professional learning provided that schools are prepared to make a long term commitment. The teachers who participated in the project reported substantial shifts in their classroom practices to allow children more independence in their learning. As their practice changed, so did their conceptions of themselves as teachers, but as with the CGI teachers, encouragement was needed to prevent new practices from becoming ritualised and less productive as sources of pedagogical inquiry. ACTS lends weight to the role of a metacognitively rich dialogic pedagogy as the key to successful learning and gives some direction as to how this might be fostered in classrooms, but it also reminds us that there are no quick fixes.

Current state of the art

The current trend is to secure a sound foundation for teaching thinking by identifying the key underpinning pedagogical principles and making connections with broader movements in educational research. Two such movements are the renewed interest in classroom dialogue and the relationship between individual and organisational learning in professional development. The emergence of a socio-cultural perspective in education lends support to the promotion of ‘new pedagogies’, which highlight the importance of authentic discourse and metacognition for learning (McGuinness et al., 2005). It is a trend that both challenges and facilitates the adoption of thinking skills approaches to learning in classrooms. The importance of engaging learners in dialogue in the classroom has been recognised by thinking skills programmes since their inception. Richard Paul emphasised the role of dialogue in helping students to learn to question their own assumptions (Paul, 1987) and Matthew Lipman advocated drawing children into purposeful conversation in the classroom by developing a community of inquiry (Lipman, 1991). In a recent empirical study conducted in primary schools in Scotland (Topping and Trickey, 2014) previous findings regarding the impact of thinking skills on students and the crucial role of the teacher in this process are verified and the conclusions drawn from the systematic review into the impact of teaching thinking on teachers (Baumfield et al., 2005) confirmed. The researchers recommend that what is now needed is that, ‘the fine-grain scaffolding of pupil/teacher dialogue in communities of enquiry in diverse classrooms should be paralleled with scaffolding effective dialogue in teacher communities of enquiry within and between schools’ (Topping and Trickey, 2014, p. 77).

For those who see the principle that thought is always embodied in practices in social contexts as fundamental to socio-cultural theory, the assumption that there are general thinking skills is mistaken. However, Wegerif (2008) mounts a defence of teaching thinking based on research into the impact of the Thinking Together programme (Littleton et al., 2005). At the heart of the Thinking Together approach is a concern to help children build and develop their knowledge and understanding together, through the practice of exploratory talk. According to this model, teaching general thinking skills involves a combination of inducing children to participate in dialogical reasoning and the structuring of the social environment for its support. It is, therefore, possible to accept that thinking is embodied in situated dialogue whilst demonstrating how the formation of intersubjective orientations and social ground rules can transcend the context and forge new shared understandings. Thinking Together recognises the importance of the teacher’s professional learning and provides a basis for design studies in which the consequences of promoting particular orientations and ground rules can be explored by
teachers as they develop their classroom practice (see for example Wegerif, Mercer, & Dawes, 1999). In doing so it exemplifies the capacity of thinking skills approaches to provide tools to support inquiry as a bridge between what students need to develop dialogic reasoning and the needs of their teachers so that dialogic teaching can become a sustainable pedagogical practice (Alexander, 2008, 2010; Wolfe & Alexander, 2008).

Researchers in the Cognitive Education Centre at Exeter University provide another example of how making connections between initiatives is securing a sound foundation for the teaching of thinking. They examined the tendency for thinking skills initiatives to be taken up with enthusiasm but then peter out, and by drawing on the school effectiveness and school improvement literature have demonstrated that this is not an intrinsic defect but rather a systemic issue arising from endemic structural shortcomings in educational institutions. School effectiveness/improvement research identifies what needs to be done in general terms to address the problems and provides the basis for the concept of a ‘Thinking School’ (Burden, no date). Working with pioneers such as Gill Hubble, who developed a whole school approach to teaching thinking in New Zealand, and with practitioners, criteria for achieving success were identified – with the formation of an educational community committed to pedagogical inquiry in the pursuit of the co-construction of a meaningful curriculum as the cornerstone.

Controversial/contested areas

Within the thinking skills community views differ as to the extent to which practitioners should be encouraged to adapt a programme or an approach. On the one hand, we have seen that over-emphasis on fidelity of implementation can lead to ritualised behaviour that stifles teacher inquiry and is, therefore, detrimental to professional learning and further pedagogical innovation. Whilst on the other hand, eclecticism could encourage a preference for novelty at the expense of critical engagement and depth of understanding. Infusion approaches to teaching thinking require some adaptation and rely on the ability of the teacher to integrate content knowledge and metacognitive skills in order to promote conceptual understanding and so present both the greatest opportunities and the biggest risks. If, as the research evidence suggests, it is the combination of purposeful student inquiry and pedagogical inquiry that is the key to success; support for freedom of inquiry is a necessary but not a sufficient condition. Projects such as CGI, NESBRC and ACTS demonstrate the need to provide tools for inquiry as the means of adopting critical, evidence informed approaches to professional development. Developing tools for inquiry can provide structures for ‘scaffolding’ the sharing of learning between students and teachers, teachers and teachers, and teachers and academics, and make working in a zone of proximal development (ZPD) for professional learning possible (Baumfield et al., 2009). In most cases the strategies within a thinking skills programme can have a dual function as catalysts for learners to inquire and also as the means of eliciting evidence for pedagogical inquiry (the ‘Thinking Through . . .’ series of subject infusion strategies illustrate how this can be done; e.g. Butterworth and O’Connor, 2005). Resources such as ‘Frameworks for Thinking’ (Moseley et al., 2005) also promote greater clarity by identifying and contextualising the elements of thinking skills programmes in current research on learning theory. Such resources have heuristic value in providing a language for teachers to talk about teaching thinking and form a basis on which to select and use existing programmes or approaches.

Finally, the tendency of policy makers to ignore or underestimate the implications of teaching thinking skills for the professional development of teachers is a further source of controversy. The potency of thinking skills as tools for inquiry is undermined when policy makers take a superficial approach to their adoption as a ‘quick fix’ on the basis of apparent gains in
student attainment. Much of the criticism levelled at thinking skills by the wider educational community has been as a consequence of this tendency for short term and piecemeal adoption of programmes in which processes become ritualised gimmicks obscuring any scope for deeper reflection by either the students or their teachers. Whilst the development of whole school approaches and the recognition of the contribution of thinking skills interventions to initiatives, such as formative assessment, requiring enhanced feedback from learners can provide greater purchase, the feasibility of taking the benefits that accrue from teachers’ pedagogical inquiry to scale remains problematic.

To be fully effective, teachers need the scope to engage in curriculum development not only to integrate the teaching of thinking appropriately but also to respond to what they learn about their students from their use. Recent trends across education systems internationally demonstrate an equivocal, if not contradictory, position regarding the role of the teacher in determining what will be taught, how it will be taught and how what is taught will be assessed. Curriculum, pedagogy and assessment have been described as the three message systems of education and how they are understood and aligned reveals what is actually valued (Bernstein, 1973). If we take the UK as an example we can see that the situation is one of flux at the current time as the four devolved nations of Scotland, Wales, Northern Ireland and England follow increasingly divergent trends in the level of prescription and the conception of teachers as professionals (Baumfield, 2012). The Framework for Thinking Skills and Personal Capabilities introduced into the Revised Curriculum for Northern Ireland (CCEA, 2003) draws substantially on the ACTS project and demonstrates the potential for a thinking skills approach to curriculum planning and classroom pedagogy to be scaled up when researchers, policy makers and teachers work in partnership.

Conclusion

The potential of thinking skills approaches to establish a virtuous circle whereby the promotion of student learning through inquiry enables teachers to engage in professional learning offers a real possibility of pedagogy as theory. The power of enhanced feedback from learners to induce a state of positive dissonance in which teachers are eager to transact understanding with students and reconnect with their practice has been demonstrated across different phases of education and in different countries. This impetus for pedagogical inquiry arising directly out of practice and having immediate application in practice lends further support to the idea that Stenhouse’s aspiration to achieve a ‘different view of research’ can become a reality. We have been returning to the same key principles since their articulation by Dewey in the early years of the twentieth century, a fact that can be viewed as both confirmation of their significance but also an indication of how difficult they are to embed securely in policy and practice. As we have seen, current trends are encouraging in so far as they draw upon a more robust evidence base and enable connections to be made with wider movements in current educational thinking. We now have a better understanding of the importance of tools for the eliciting and embedding of principles into practice and recognise the importance of forging partnerships for the promotion of professional learning. Nevertheless, sustaining communities of pedagogical inquiry across the institutional boundaries separating researchers, policy makers and practitioners remains the biggest challenge.

References


