Thinking skills in England's National Curriculum

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Abstract

This paper sets out to explore some of the issues raised by the introduction of a number of particular skills in the English National Curriculum known collectively as thinking skills. These skills are now embedded in the National Curriculum and teachers are required to address them as part of their daily duties. This paper argues that presenting such a limited selection of skills as the foundation for effective thinking may lead to an inadequate approach to enhancing pupils' thinking. Although creative thinking is emphasised in addition to the considerable focus on reasoning in the list of thinking skills presented in the National Curriculum, silence prevails on other types of thinking of equal significance such as, contemplation and sign-cognition (a form of pre-verbal and pre-imaginal form of cognition). The paper attempts to highlight the need for the awareness of the complex nature of thinking and concludes by highlighting the opportunities that the introduction thinking skills offer teachers. .

Keywords: Leading thinkers, lesson cycle, dispositions

Introduction

Teaching thinking skills is now part of The National Curriculum in the English educational system, and teachers are required to address these skills in their daily work with pupils. In the handbook for secondary teachers in England (Qualifications and Curriculum Authority (QCA), 1999) thinking skills are unequivocally presented as follows:

> By using thinking skills pupils can focus on 'knowing how' as well as 'knowing what' – learning how to learn. The following thinking skills complement the key skills and are embedded in the National Curriculum.
>
> *Information-processing skills*
>
> These enable pupils to locate and collect relevant information, to sort, classify, sequence, compare and contrast, and to analyse part/whole relationships.
>
> *Reasoning skills*
>
> These enable pupils to give reasons for opinions and actions, to draw inferences and make deductions, to use precise language to explain what they think, and to make judgments and decisions.
>
> *Enquiry skills*
>
> These enable pupils to ask relevant questions, to pose and define problems, to plan what to do and how to research, to predict outcomes and anticipate consequences, and to test conclusions and

improve ideas.

Creative thinking skills.

These enable pupils to generate and extend ideas, to suggest hypotheses, to apply imagination, and to look for alternative innovative outcomes.

Evaluation skills.

These enable pupils to evaluate information, judge the value of what they read, hear and do, develop criteria for judging the value of their own and others' work or ideas, and have confidence in their judgments. (p.23)

As stated above, these five skills essentially represent what teachers are to understand as thinking skills, and on this foundation proceed to find opportunities to teach pupils these skills in their daily lessons. In order to provide guidance on the teaching of these skills in schools, the Department for Education and Skills (DfES) provided resources for school leaders and classroom teachers to use in developing and promoting pupils' thinking skills at Key Stage 3 and beyond. These resources focus exclusively on the five thinking categories mentioned earlier and include a Handbook for Teachers (DfES, 2005a), a Guide for School Leaders (DfES, 2005b) and a School Training Manual (DfES, 2005c). As both the handbook for teachers and the school training manual only provide further explanations and strategies for lesson deliveries based on the main points presented in the guide, the paper begins by discussing the Guide for School Leaders.

Guiding school leaders to teach thinking skills

Leading in Learning

The Leading in Learning programme promotes the systematic and explicit teaching of thinking in cycles of three lessons across three subjects, known as the 3-lesson cycle. In this way, systematic coverage of key aspects of thinking skills can be ensured, and ultimately these can be located in subject schemes of work.
Leading in Learning: developing thinking skills at Key Stage 3: Guide for school leaders (DfES, 2005b) (p10)

The Guide for School Leaders (DfES, 2005b) introduces the notion of 'Leading in Learning'. As stated above, it is explained as a structured programme for teaching thinking skills throughout Key Stage 3 (The first three years in secondary school known as Years 7, 8 &9) and beyond by adopting a cross-curricular approach that is different from having separately timetabled lessons or programmes confined to a particular subject. According to The Guide for School Leaders (which will henceforth be referred to as the Guide) the programme is innovative in requiring collaboration across departments to teach an agreed thinking skill. This will be done in cycles of three lessons across three subjects known as the 3-lesson cycle based on a common teaching strategy, one lesson in each of the chosen subjects. Foe each lesson in the cycle, teachers are asked

to set their subject content in a context where the emphasis is on promoting a selected thinking skill and how it might be used in order to encourage the development of thinking skills and its transfer across subject areas.

As stated in The Guide, the programme is deliberately structured so that teachers and pupils look beyond subject confines to thinking and learning more generally, and in order to achieve this, it aims (among others) to identify clearer patterns of pupils' progression in thinking skills to inform future planning and teaching.

One of the key principles highlighted in The Guide for schools to consider is the establishment of a small group consisting of three 'strong teachers' called 'Leading thinkers' drawn from the teaching staff to spearhead the development of thinking skills within individual schools. The Guide suggests that before the whole-school launch it is essential that the trio of 'Leading thinkers' have taught 'at least two 3-lesson cycles' as this is 'the minimum needed' in order to gain the experience to lead colleagues with confidence. The programme is designed to be well established throughout the school over one academic year.

Difficulties with the programme

The fact that the programme emphasises a collaborative approach wholly different from having lessons confined to particular curriculum subject areas

raises some important issues for its successful implementation in the classroom. The first is the long-term development of the programme, the second is the assessment of pupils' progression in their thinking skills lessons and the third is concerning the notion of 'Leading thinkers'.

One of the justifications provided for the emphasis on separate lessons for teaching thinking skills is that this will assist teachers and pupils to focus on such skills. If it is the case that skills in thinking can only be promoted through separate lessons then what will the provision of other subject lessons outside of these thinking skills lessons consist in? An intrinsic part of learning a subject involves the understanding and application of certain ways of thinking at all times. For example, learning mathematics will always involve logical thinking and for that reason one does not need to master logical thinking separate from learning mathematics. Similarly in art, learning how to draw pictures will always involve a kind of thinking, for example, about the use of light and dark colours, and it would be absurd to try to develop such a way of thinking separate from the subject.

In requiring departments to collaborate in teaching an agreed thinking skill over a '3-lesson cycle' there is the assumption that such a skill can be easily found, taught, and when learnt, transferred across curriculum subjects without any adaptation to the requirements of those specific subjects. It is not clear to what extent the subtle differences in approaches required in teaching and learning the

various curriculum subjects are taken into account when collaborating across subjects. For example how will this collaboration be approached where English Language and Physical Education are involved? Clearly these subjects may require different approaches in developing pupils' skills and if this is the case how will the 3-lesson cycle demanded by the programme be conducted? Cogent arguments are required to underpin the use of the 3-lesson cycle model.

One of the long-term difficulties with creating separate lessons for promoting thinking is that it may lead to the untenable view that lessons outside these special thinking skills lessons are irrelevant to promoting thinking. This leads us to the second major issue concerning assessment. If there are to be lessons for promoting thinking skills, what are the implications for assessing pupils' progress? The Guide for school leaders provides very little direction on this issue. It attempts to tackle it by stating that:

> In making a judgment it will be important to look beyond the 3-lesson cycles of thinking skills lessons and consider the extent to which, through a process of infusion by both pupils and teachers, there are visible benefits in other lessons. The acid test will be that pupils are aware of their enhanced thinking skills and of their capabilities as learners and that this leads to higher standards in all subjects. (p34)

It is not clear from the above statement how pupils' awareness of their enhanced thinking skills will be adequately assessed. How are we to interpret the notion of 'visible benefits' in this case? Will these judgments be based merely on anecdotes from teachers and pupils or on formal assessment of pupils' learning

and understanding? What form will such assessment take?

In addition to the issues associated with the 3-lesson cycle model another difficulty with the programme is the notion of ‘Leading thinkers’ in the delivery of these lessons. One of the reasons for devising the ‘Leading thinker’ role as indicated in The Guide is to reduce the cost of training teachers to use the programme. However, this is potentially misleading since it conflates coordination of the programme with expertise in thinking. I will now turn to the sources of the issues.

Sources of the difficulties

The issues with the programme highlighted above stem from two related sources. The first is the notion of thinking skills as presented in the National Curriculum, and the second, is due to the influence of the McGuiness (1999) report on teaching thinking skills.

1. The notion of thinking skills

The National Curriculum expresses thinking skills as involving skills focusing on ‘knowing how’ as well as ‘knowing when’ and by so doing appears to construe thinking wholly in terms of the skills presented in the National Curriculum. The nature of thinking is by no means uncomplicated. White (1967) highlighted the polymorphous nature of the notion due to the different uses of the word ‘think’,

drawing particularly from the fact that it successfully covers several aspects of the workings of our intellect. Thus, it can be used to signify an activity, a result, an opinion or the possession of a concept. White's analysis of thinking is well articulated by Ryle (1971) in his exploration of the notion of thinking as follows:

> The word 'thinking' covers some activities which are attempts to reach the answers to questions, as well as others which are not; some activities in which there is scope for originality and insight, as well as others where there is not; some activities which incorporate ratiocination, as well as others which do not; some activities, like multiplication and translation, which require special training, as well as others, like reverie, which do not. To look for some common and peculiar ingredients of all thinking is like looking for an ingredient common and peculiar to cat's-cradle, hide-and-seek, billiards, snap and all other things which we call 'games'. (pp.297-298)

Thinking can broadly be understood as an activity of the intellect but the diverse ways in which the notion can be applied underlines the high level of care that is required in its understanding and application.

Price (1969) called the pre-verbal or pre-imaginal kind of thinking sign-cognition. This is closely related to feelings and practical behaviour as exhibited in a tennis player's excellent judgment in returning a serve, or the empathy that a person is capable of extending to another person. For Price, sign-cognition is an activity that refers to an intentional object, that is, it involves an object upon which attention is focused. If Price's argument is accepted, then what a tennis player does when playing tennis involves thinking, but this is somewhat different from the thinking involved in the quiet contemplation of a philosopher, or the thinking deployed by an engineer in solving a bridge building problem. While these different types of thinking involve reasoning in some way, Ryle (1971) reminds us

that not all thinking is strictly logical reasoning. Nonetheless, reasoning is involved in much of what we do in our daily lives since it comprises a great variety of procedures (Pole, 1972) embodied in the skilful ways by which we solve the problems that we encounter.

Is thinking merely a skill? In other words can it be improved in the same kind of way as dribbling a football or whistling? White (2002) argues that understanding thinking as an activity means that it is something at which children can improve. In other words, the activity can get better with practice and it is precisely this reason why thinking is sometimes characterised as a skill. All the same, White emphasises the importance of personal qualities in thinking. Similarly, in the acquisition of all but the simplest skills, Barrow (1987, 1990) maintains that the role of such things as understanding, dispositions, values and emotional maturity are highly significant. For example, acquiring the skills of a researcher in a particular field, or creative skills involves to a very large extent understanding of such diverse things as bodies of knowledge, being committed to certain values such as truth, and being disposed to do certain kinds of things rather than others. These skills, argues Barrow, are not physical or trainable, and are in addition context bound. Consequently, acquiring them appears to be by no means straightforward. For Barrow, a necessary condition of being critical or creative involves the understanding of particular domains and the skills that underpin such understanding are not things that can be transferred.

Johnson (2001) draws our attention to the dangers associated with the attempts to teach thinking as a set of skills or simple rules to be followed. For such attempts will lead to specific-subject knowledge being viewed not only as mere material on which to practice such skills, but worse still as a source of great inconvenience or waste of pupils' time. Specific subject knowledge, as pointed out by Johnson, is far more important than proponents of general thinking skills care to admit. In other words, what counts as good thinking is determined largely by the subject matter and as such one cannot separate thinking from the context within which it is applied. And to have knowledge of subject matter is to acquire certain ways of saying or doing things and feeling about those things.

Reducing thinking skills to merely rule following can create a condition that undermines or completely ignores the feelings that form a crucial part of thinking. Following Barrow's (1987, 1990) analysis of the notion of skills, Pring (2004) draws attention to the misuse of language reflected in the importance placed on the particular application of the concept of 'skills':

> The disadvantage of attaching so much importance to skills is that the concept fails to do justice to other mental qualities and cognitive achievements which cannot be reduced to 'skills', mental or physical – for example, the imagination through which the artist becomes more than a craftsman and puts the craft skills to a particular effect, the critical understanding through which the teacher is able to challenge the assumptions behind policy and to establish his or her own educational ideal, the moral and personal qualities through which the politician can direct the skills of 'personal effectiveness', the judgment as to when a particular skill is appropriate. (p.112)

What is apparent from the above analysis is that the difficulties attached to the simplistic use of the notion of 'skills' in association with thinking is such that it

weakens the effectiveness of the approach(s) currently being proposed to support the enhancement of pupils thinking. I will now move on to the second source.

2. The report on teaching thinking skills

The inclusion of the five thinking skills in the National Curriculum was strongly influenced by the McGuinness report (1999) commissioned by the Department for Education and Skills (DfES) to investigate the best way to introduce the teaching of thinking in formal education. The main purpose of the report was set out to include the following elements:

a) The analysis of what is currently understood by the term ‘thinking skills’ and their role in the learning process.
b) The consideration of how teachers might be able to integrate thinking skills into their teaching - within subject areas and across the curriculum.

The report is highly significant in not only drawing together some of the most important programmes for teaching thinking but also in highlighting the importance of developing pupils’ thinking. However, its scrutiny of the notion of thinking raises some issues. In analysing what is currently understood by the term "thinking skills", the report fails to adequately highlight the issues associated with the use of the term as already indicated earlier. In the report, it was stated that:

> The idea of thinking-as-a-skill continues to have theoretical force as it places thinking firmly on the side of "knowing how" rather than "knowing that" in the long standing philosophical debate about the nature of knowing. (pp.4-5)

It is not quite clear what is indicated by “thinking being firmly on the side of knowing how rather than knowing that". The importance of clarifying the confusion surrounding the use of the concept of thinking goes without saying since it lies at the heart of any attempt to enhance pupils’ thinking. In providing a less than adequate explanation, the report only contributes to the existing confusion. Due to the highly complex nature of thinking it is impossible to attempt to arrive at a coherent definition of thinking as a unitary skill. The idea that placing thinking-as-a-skill "firmly on the side of knowing how" rather than "knowing that" assumes that *knowing how* is entirely independent of *knowing that*. The fact that knowledge can be understood in different ways does not necessarily imply that these different ways are mutually exclusive. For example, knowing how to do something presupposes knowing about that something, hence knowing how to drive a car involves knowing what a car is in the first place, knowing that a car has a steering wheel and various levers such as an accelerator, a combination of gears and brakes etc.

The complex nature of the relationship between thinking and knowing highlights the point that thinking cannot be viewed primarily as a set of rules to be applied in any situation. However, the report does not accentuate this important point about the nature of thinking and argues that if we want pupils to become better thinkers then we must "devise ways of educating directly for thinking."

The assumption that there are general thinking skills that can be taught in their

own right pervades much of the work presented in the report. What strengthens the drive to find and teach such skills is the desire to unlock the power of transferability across subject domains alleged to be inherent in thinking skills. In view of the importance of transfer, only minor attention was devoted to such a crucial aspect of teaching thinking skills in the report. The issue of transfer presents an intractable problem for teaching thinking skills programmes. Sternberg's (1987) observation that the activities of teaching thinking skills are meaningless if they do not result in transfer is still relevant today. Similarly the conclusion drawn by Perkins (1987) that programmes on teaching thinking skills fail to provide the conditions for transfer continues to hold.

The report acknowledges the major problem regarding the transferability of thinking skills across domains and recommends that in order to be successful, all thinking skills programmes need to adopt methods to minimise the risks of failing to transfer such skills across domains. This advice to prospective users of thinking skills is indeed difficult to follow, since the alleged transferability of such generic expertise in thinking across domains is yet to be substantiated (Glevey, 2006).

The concluding section of the report maintains that, although theoretical emphases can differ, sufficient research and ongoing practice have accumulated to identify core concepts in a framework for developing skills in thinking. What this implies is that finding a way through the difficult conceptual issues

associated with the idea of teaching thinking is not altogether crucial in affecting the kind of framework that is employed. But not paying careful attention to finding a firm foundation can only result in the perpetuation of the present conceptual confusion.

The report is mainly descriptive in nature, providing a generally positive overview of some of the widely known teaching thinking skills programmes. Consequently, the conclusions reached in the report fail to present a balanced account of the issues surrounding the teaching of thinking skills as a basis for finding effective ways to support pupils in the development of their thinking.

The desire to teach skills general to thinking

The desire to teach skills general to thinking is not new. The current efforts being made to introduce these skills into the school curriculum have their roots in the late nineteenth century. In his examination of educational thinking in the period 1870-1914, Selleck (1968) tells us that the influence of faculty psychology among educationists of the time brought with it the notion of general mental abilities. The main doctrines from faculty psychology postulated the existence of a number of faculties or powers through which the mind operated. The intellectual faculties for example, consist of the faculties of imagination, of judgement, of reasoning, of perception, of memory. In addition to the assumption that these faculties existed was the notion that they could be trained, which in turn provided the justification

for the belief that a general discipline of the mind was possible, and finally culminating in faculty training becoming the basis upon which education was defined. The curriculum was viewed as a means of training the various faculties. For instance, arithmetic developed the reasoning powers; history developed the powers of memory etc. To the belief in the existence of faculties and the need to train these faculties was added the assumption that, just as muscles can be trained through a series of physical exercises, so, too, can the mind be trained through classroom activities. This training can then be transferred to tasks in real life situations far removed from normal school settings. Many decades on, justifications are being hunted to support the teaching of thinking skills that are now part of the school curriculum in the British educational system. The issue of teaching thinking skills has generated much controversy producing adherents (Wegerif, 2004; Smith, 2002; McGuinness, 1999; Quinn, 1994) and sceptics (White, 2002; Johnson, 2001; Andrews,1990; McPeck, 1981). I will briefly outline the current debate on thinking skills.

The seductiveness of thinking skills as already indicated earlier is due to the idea that they are transferable, hence when acquired in one context they can be applied in others. White (2002) argues that it is highly unlikely that there are widely transferable thinking skills, and this argument is at the core of the thesis presented by sceptics against the generic notion of thinking skills. White maintains that the reasoning and enquiry acquired in history classes is very different from the reasoning and enquiry involved in learning geometry or

planning a family holiday. For White, each requires knowledge of its particular subject matter, drawing on its own kinds of evidence, and reasons according to its own particular standards. But how does White respond to the charge that having mathematical skills for example, is crucial in tackling problems in physics? He admits that there may be general skills that cover widely diverse fields and for that matter there is likely to be some transfer in closely similar fields, but, the belief in transferability across all subjects still remains unfounded due to lack of good evidence to support the claim.

The need to seek a better foundation for teaching general thinking skills that can overcome the issues raised by sceptics as exemplified by White led Wegerif (2004) to propose an account that is compatible with the assumptions of the sociocultural paradigm. The essence of this perspective is to consider learning and cognitive development not merely as culturally influenced but as culturally based, in other words, as social rather than individual processes. Wegerif maintains that a basis can be provided for understanding how general thinking skills can be taught and learnt if they are embedded in a type of discourse that can be characterised by intersubjective orientations and shared social ground rules and supported by social contexts.

Wegerif attempts to provide a basis for understanding thinking skills from a socicultural perspective. However, what remains unclear is how his proposal covers the different kinds of thinking in view of the fact that he focuses largely on

reasoning as the defining element of general thinking skills. If the arguments presented by Price (1969) and Ryle (1971) highlighted earlier are acknowledged, then Wegerif's focus on general thinking skills mainly in terms of reasoning is not far reaching . For instance, can having a good level of reasoning in solving mathematical problems be generalised to aid interpersonal skills? Some of the issues for adherents of general thinking skills to address are by no means insignificant, and so far good evidence for such transfers of thinking skills still remain unsubstantiated.

Justifying the teaching of thinking skills

A key justification for seeking to include thinking skills within the school curriculum is the belief in the potential economic advantage of having such skills. In their provision of a broad survey of the development of generic skills in England from 1977-2002, Hayward and Fernandez (2004) concluded that despite an evident demand for generic skills in the English economy, education and training policy planned to motivate the supply of such skills have failed to deliver the desired results. They argue that not only have policy developments to teach such skills suffered implementation failure, the attempts have resulted in long prescriptive list of skills with little educational merit, which had the unintended effect of limiting rather than expanding opportunities for learners. Furthermore, such skills have failed to deliver on their transferability, the supposed key feature of generic skills.

Higgins et al (2005) on the other hand presented a comprehensive research review for evidence to support the efficacy of thinking skills across subject areas. One of the main reasons for the research was to quantify the impact of thinking skills interventions in order to test the conclusions of the mainly descriptive reviews in Britain as presented by McGuinness (1999); Wilson (2000); Higgins *et al*.(2004). The research report concluded that the impact of thinking skills may vary according to subject. The key implication of the findings by Higgins et al (2005) was as follows:

> Whilst thinking skills programmes and approaches have a positive impact on pupils' attainment, such impact is not always consistent. The evidence from this review suggests that there is a need to select interventions carefully and to be prepared to persist with an intervention, as it may not always provide improvement on curricular measures in the short-term. Research also indicates that the causes of improvement in pupil learning are complex and a more general emphasis on making aspects of teaching and learning explicit in classrooms (particularly in terms of making reasoning explicit) may have similar benefits to those obtained through a particular programme of intervention. Further research across a wider range of subjects and age groups would be particularly useful, as would comparative research to evaluate the relative benefits of different thinking skills programmes and approaches, as well as a comparison of such approaches with other educational interventions. (pp.45-46)

The fact that the review points to further research for deeper understanding of the effectiveness of thinking skills across subject areas highlights the non trivial nature of the question concerning the development of pupils' thinking skills.

Although progress is being made in the right direction important issues still remain to be addressed and care must be taken to seek durable answers in order to provide the best possible foundation upon which the development of

pupils' thinking can be establish. We must not ignore or avoid the difficult conceptual questions that arise, especially if thinking skills are held to be of great importance not only to the pupils but also to the community in general. These questions include: What is the nature of thinking? Are there different kinds of thinking? What personal qualities are most beneficial in promoting effective thinking in pupils? The introduction of thinking skills in the National Curriculum is an opportunity for teachers to engage positively with the fundamental issues concerning how they can support their pupils to learn to engage effectively with the world around them. Furthermore it can provide the basis for teachers to work collaboratively in powerful new ways if they are prepared to be open-minded and willing to share ideas.

Conclusion

In this article I have explored some of the issues raised by the introduction of thinking skills in the English National Curriculum. Firstly, I discussed the main approach presented in the manual for teachers to teach their pupils thinking skills. Secondly, I focused on the problems associated with the programme as presented in the manual for training teachers deliver these. Thirdly, I drew

attention to the sources of the problems and identified them as emanating from the complex nature of thinking and the McGuniess report on teaching thinking skills. Finally, I considered some of the broader and on-going arguments surrounding the notion of general thinking skills. I emphasised the opportunity that the introduction of thinking skills present for teachers to engage with some of the difficult conceptual issues in finding durable answers to support all pupils to improve their thinking in English schools.

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