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Two Birds With One Stone

Teaching Reading and Teaching Thinking

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ABSTRACT The aim of this article is to illustrate how the teaching of thinking can be incorporated into regular teaching, using the teaching of reading as an example. It provides a brief overview of current understandings of the processes of learning to read and learning to think and then considers how noticing, naming, comparing, categorizing, connecting, generalizing and remembering, which are just some of the many cognitive processes refined as children develop, can be explicitly mediated in the course of teaching reading. It makes a final proviso that this mediation can only be effective in a supportive learning climate in which cognitive dispositions are valued and nurtured.

Introduction

There is an enormous literature on the teaching of reading. There is also a substantial and growing literature on the teaching of thinking. There is concern that schools and teachers do not make optimal use of the knowledge available concerning the acquired aspect of effective thinking (Adey, 2002; Perkins, 1995; Turgeon, 2001). There are many possible reasons for this, but one is certainly a perception by many teachers that 'teaching thinking' requires extra work not clearly linked to the curriculum. This article links the teaching of reading and the explicit teaching of thinking in order to highlight how these processes can reinforce each other. It begins with a very brief review of the key issues in each area and then discusses in some detail how learning to read can involve learning to think and how learning to think can enhance the process of reading.

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The teaching and learning of reading

Reading is the process of extracting meaning from written text. In order to be able to do so with ease and fluency, the reader has to approach the task with certain attitudes and be in possession of specific knowledge and particular skills. Attitudes that are important include curiosity, confidence and a willingness to take risks. Necessary knowledge for beginning readers includes fluency in the language of the text as spoken language, sight recognition of the written form of the words that most frequently appear in texts, grasp of the principle of sound-symbol correspondence, knowledge of specific sound-symbol correspondences and the ability to use known phonic rules to construct and decode simple words. This knowledge provides the tools for extracting meaning. But the tools cannot be used effectively unless the reader brings to the text an expectation of finding meaning and the text offers to the reader a meaningful connection with previous experience. The reader's expectation of meaning guides and informs her guesses when she is unsure. The text's meaningful content permits the reader to apply her general knowledge to this process.

As reading develops the mechanical process of decoding is facilitated by additional tools such as the ability to break words into syllables and to recall word families. Regular practice in decoding a variety of materials that can be read with relative ease builds fluency and confidence. Regular and systematic practice with texts that offer some challenge encourages the application of additional phonic knowledge and the use of higher order strategies such as the conscious use of contextual and linguistic knowledge and the adaptation of reading style and approach to the purpose of any reading task. As these processes become habits, the reader becomes capable of interacting meaningfully with increasingly complex texts. Growing familiarity with books and other written materials means that the reader now knows something about the structure of different kinds of texts and can use this knowledge to make predictions.

The development of reading is further enhanced by the parallel development of its mirror image, the production of written language. As children learn to write what they want to say, they become aware of text as a means of communication and can be helped to consider printed texts as the creations of individual authors with particular purposes. They reinforce their phonic decoding skills as they use them to encode their own thoughts and ideas. They strengthen their sight word memory as they recall and write the words they frequently need. Written language offers much more, however, than the discovery in text of what is already known. It is a major source of new knowledge, a means of expanding horizons and a source of pleasure and satisfaction. The person who reads fluently joins a community of people, both past

and present, who are in ongoing conversation. As with any conversation, meaningful participation depends on both the possibility of connecting to prior knowledge and the opportunity to go beyond it. Reading, like talking, can be engaged in at many different levels. The one extreme favours the known and is easy and familiar. The other extreme emphasizes the unknown and is challenging and more difficult. But without some connection to the known, understanding is impossible.

In *learning* to read, it is essential that the written words reflect a known reality because the new reader has to discover the possibility of representing knowledge and ideas in written form. The new reader has to construct, with the mediation of supportive others, the *concept* of written language. This is as true of adults learning literacy as of children, although the former may grasp the principle more quickly. Only once this understanding is established can reading become a means of acquiring new knowledge and exploring the unknown.

The process of fluent reading, although not fully explicated, involves a number and variety of interactive mental activities in parallel, some consciously adopted and others automatic (Alderson, 2000; Goodman, 1982; Grabe, 1991; Stanovich, 1980). The teaching and learning of reading requires attention to all these processes.

The teaching and learning of thinking

This part of the article is based on the Vygotskian assumption that all individuals are equipped at birth with what he describes as 'lower mental functions' (Vygotsky, 1962, 1978). Joining the cultural community of human beings involves being initiated into the ways in which human cultures have refined and developed these mental processes, primarily by means of language. From birth onwards, children possess characteristics that enable them to engage with and survive in the world. For a start, they have a strong desire to make sense of experience. In order to make sense of the everyday world they employ their capacity to notice, name, compare, categorize, connect, generalize and remember, assisted, to a greater or lesser extent, by the mediation of more knowledgeable others. Over time they acquire, together with language, the thinking tools and practices that their culture values and mediates to them (higher mental processes), and in doing so, become more capable of effective reasoning, learning, problem solving and judgement.

When children start school and enter the world of formal knowledge with all its conversations and complexities it continues to be important to refine the thinking processes learners already possess in order to make learning and thinking more effective. Sometimes this happens as

a by-product of good instruction. But sometimes it does not. Educators and caregivers can facilitate and mediate the development of effective thinking by explicit mediation of thinking processes and the provision of a vocabulary for talking about thinking. This is the position adopted by, among others, Adey (2002), Ashman and Conway (1993), Burden (1998), Feuerstein et al. (1991), Greenberg (2000), Haywood (1993), Perkins (1995) and Tishman et al. (1995).

Refining and developing thinking attitudes and skills

The expectation of meaning

Looking for meaning is a human characteristic. Effective thinkers and good readers expect meaning. Learners' expectation of meaningfulness in learning situations cannot, however, be taken for granted. Haywood (1993) points out that understanding what is stable and predictable in one's world is an important basis for constructing meaning. This includes awareness of relationships in time and space and of the properties of the physical and social world. With experience and guidance learners come to understand that different forms of meaning can be accessed in different ways. Unfortunate early schooling experiences can, however, create the understanding that meaningfulness exists only in out-of-school contexts.

Learners who have come to expect non-sense from school activities will not approach the task of reading with attitudes likely to promote success. The teaching of reading can reinstate the importance of meaningfulness and bridge this to other aspects of the curriculum, especially since the source of much school knowledge is written texts.

This involves interaction with written text together with peers in order to discover and negotiate meaning, guided by a mediational educator (Feuerstein et al., 1991) whose task is to emphasize that meaningfulness exists and to provide strategies and clues by which it may be arrived at. This may involve introducing the idea that becoming literate is a way of joining an ongoing conversation, in which we use reading to find out what others know and think, and writing to tell others about our own thoughts. We can put the information gained from reading together with what we ourselves know and think in order to generate understanding and, sometimes, new knowledge. An educator can model curiosity and questioning in interaction with written text and offer examples of strategy use, such as contextual or linguistic guessing, as tools to reach meaning. It is important to make explicit that this is the purpose of reading, and explain that everything else one learns – the phonic rules, the sight words, the syllabification, etc., are tools rather than ends in themselves.

Questions to ask
What do we need to pay attention to here?
What small differences could we miss if we are not careful?
How are these two the same?
In what ways are they different?
Which differences is it important to notice?
Which differences can we ignore?

Possible applications
Letters, e.g. b and d, e and c, p and b, p and P …
Words, e.g. me and my, you and your, was and saw, house and horse …
Words, e.g. cat, cot, cut; and cat, mat, hat …
Word meanings, e.g. walk and walked; big and enormous …
Forms of text, e.g. story and recipe, descriptions and direct speech …

Some messages learners receive
There are times when it matters to be careful, systematic and notice detail.
This is how we can be sure we do not miss anything.
Remember to think about being careful.
Comparing sometimes needs to be carried out systematically.

Figure 1 *Noticing and comparing*

Noticing, naming and comparing

The random noticing typical of early childhood develops into the conscious selection of objects of attention, the ability to survey systematically and the awareness of the importance of relevant detail. The use of language for naming is extended to the active creation of names or labels to help order one's world and hold information in memory. At the same time awareness develops of how names and labels are used by others in a similar fashion. The simple and unrecognized comparisons of young children become systematic and intentional comparisons in terms of criteria, together with an awareness that criteria may change depending on the purpose of the comparison.

Readers do a great deal of this, with or without conscious awareness. They have to notice small differences between letter shapes and sounds, between word shapes and sounds, recognize differences between linguistic patterns and, eventually, between different forms of discourse. This is a conscious process in the early stages but most theorists of reading emphasize the importance of developing automaticity. The early stages provide an opportunity, however, to introduce the idea that there are times when it matters to be careful and systematic and to notice detail, for example in identifying words, and that naming can be a useful strategy to assist recall.

Beginning readers learn that letters possess both names and sounds and that this is an important distinction. Learners can also be introduced to the idea of naming in order to be precise when identifying something and indeed in becoming readers they learn the names of many things in the world as they extend their vocabulary. Educators know this is important but they do not always take the opportunity to talk about names and their uses. Children can learn the difference between names or labels that everyone uses and names and labels that we create for ourselves.

In learning to read children have to compare letters and written words, looking for similarities and differences that will help them recall what they need to know. Later on they will compare texts and styles. Throughout their learning careers they will be required to make comparisons in many areas of study. Beginning readers can be helped to make simple but systematic step by step comparisons using appropriate criteria such as shape and direction. The thinking tool of effective comparison, introduced explicitly as children learn to read, can reach far beyond that in its usefulness.

Categorizing

Unsystematic classifications made by young children are refined over the course of development to enable the classification of objects and ideas according to criteria. The notion of belonging and not-belonging is broadened to include relationships of part-whole and overlapping categories. Effective thinkers eventually possess a sense of the flexibility of categories and the permeability of boundaries but at the same time are well aware of their usefulness.

Categorizing is part of learning to read. The teaching of word families requires classification. Practice in fluent and flexible classification is almost inevitable in learning to read. Words may be categorized semantically, linguistically, according to phonic rules or according to a personal 'rule'. This offers scope to introduce the notion of classification and explain its usefulness and to point out at an early stage that categories depend on criteria and that criteria can be changed to suit different situations. This awareness will stand learners in good stead when they are fluent readers who need to classify ideas, both the author's and their own.

Making connections and recognizing relationships

Young children's connections tend to be based on simple proximity and random experiences. As they develop they learn to search actively for, and create, meaningful connections between different 'bits' of knowledge, between prior knowledge and new knowledge, between everyday knowledge and school knowledge and between ideas and

Questions to ask

How will we decide what belongs together?
Is there only one way we can group words, ideas?
What name/label shall we give this group, this story?
Does it matter if we use our own labels?
Why do we put things into groups?
What else do you know that is grouped and given a special name?

Possible applications

Explaining the difference between letter names and letter sounds – why names are important
Discussing groups/categories
Sorting words into groups using different criteria, e.g. 'words that follow the same spelling rule', 'words that I use very often', 'words that have to do with the seaside', etc.

Some messages learners receive

Classifying/categorizing things and ideas helps us to be clear about what we know.
Many classification systems already exist but we can also make our own.
Classifying can be done in different ways for different purposes.
Classifying makes what we know easier to remember.
When we classify we may even need sub-categories.

Figure 2 *Naming and categorizing*

action. They learn about different forms of connection or relationship and become more systematic in the way they organize what they know. They also discover the ways in which the physical and social world has already been organized by human communities. They learn to recognize the patterns in which knowledge is generally organized and to create their own patterns and organization.

Successful reading depends on making meaningful connections, as described earlier. In addition, reading depends on a familiarity with arbitrary connections between what is seen and what is heard. This is an opportunity to draw learners' attention to the existence of culturally constructed conventions and their usefulness, as well as to alert them to the fact that they are not 'cast in stone'. A teacher of reading can, moreover, make learners aware of different forms of relationships by drawing attention to the common words that signal connections and relationships, such as: *and, but, because, if* and *or* and help them identify the relationships involved. Readers who have learned early that making connections and noticing relationships are important are more likely to develop into active readers of more complex texts.

Questions to ask
How does this fit with what you already know about …?
How does this fit with what you do at home?
How does this fit with other things you have learned?
What kind of connection does 'because' make?
What other kind of connection could there be?
Are connections already there in the world or do people make them?
Can we change the way things are connected?

Possible applications
Meanings in different contexts.
Meanings from different perspectives.
Arbitrary connections such as sound-symbol correspondences.
Key words in texts that signal connections.
Relationships between different parts of a text, e.g. statement + reasons; argument + summary, etc.

Some messages learners receive
It is important to notice how things and ideas relate to each other/are connected to each other.
There are different kinds of connections.
Sometimes people have already organized things/ideas but we can reorganize them if we need to.

Figure 3 *Making connections*

Discovering and generating rules

Some of the crude generalizations of young children may remain well into later childhood, but the capacity to generalize itself is extended and refined. Children need to be helped to understand the usefulness of a principle or 'rule' in guiding successful action. They should have the 'aha experience' that they do not need to guess or remember on every occasion, but can apply a 'rule'. This is very different from thinking of rules as constraints. Children are being introduced to deductive reasoning – the process of using a rule to guide thought or action. An awareness of the possible existence of rules can stimulate the desire to discover rules, or generate one's own, from the study of numerous examples – the process of inductive reasoning. Children also need to be helped to realize that there are different kinds of 'rules' – those that apply to the physical world and are relatively immutable, those that are generally accepted by human societies and those that are made in particular communities for specific purposes, e.g. classroom 'rules'.

Phonic rules are an obvious example of rules that can direct learners so that they do not need to rely on memory or random guesses. This is

Questions to ask

Do we just have to remember or is there a 'rule' that we could use to help us decide?
Will this 'rule' work in every situation?
If we use this rule, what will we say when we see …?
How can we remember the rule?
How can we find out what the rule is for deciding how to …?
Could we find out other 'rules' by doing this?
What is the difference between the 'rules' we use to help us read and answer questions and school rules?
Is there a 'rule' for everything?

Possible applications

Phonic rules
Exceptions
Linguistic 'rules'
Structural regularities in texts
Some messages learners receive:
There are regularities in the world that can help us understand it.
Remembering a 'rule'and applying it can make learning easier.
'Rules' can sometimes be discovered by examining a lot of examples.
Sometimes 'rules'do not apply but this does not mean they are not useful.

Figure 4 *Discovering and generating 'rules'*

not to say that guessing does not have a place, but rules are another part of the reader's repertoire. In English of course, there are many common exceptions but this is an interesting opportunity to talk about 'the exception that proves the rule'. The fact that something is perceived to be an exception implies that there must be a general rule in operation.

Metacognitive awareness, planning and problem-solving

Finally, learners can be helped to stand outside themselves and watch their own thinking processes at work. This is often referred to as metacognitive awareness. Metacognitive awareness enhances planning, problem solving and the management of thinking. It involves the conscious choice and systematic practice of thinking processes to suit the demands of particular situations. Some effective thinkers and learners operate intuitively, using the refinements of the lower mental processes that they have gradually acquired without conscious effort. Many other learners can be actively helped to develop their skills. All learners can become more metacognitively aware. This is what is meant by the 'teaching of thinking'.

Questions to ask
What will help us to remember this?
What special ways do you each have for remembering?
What part of this is it important to remember?
Why do we need to remember it?
Will it help if we re-organize it?
Is this something we need to understand or can we just memorize it?

Possible applications
Activities for recalling sound-symbol correspondences
Activities for recalling sight words
Activities for recalling 'rules'
Activities for recalling 'content' in preparation for tests

Some messages learners receive
We can learn to remember more effectively
We need to choose what to remember
We can organize knowledge in ways that make it easier to remember

Figure 5 *Remembering*

The teaching of reading offers many opportunities for metacognition. Learners can be asked to consider carefully what made them read *house* when the text had *horse* (becoming aware of their own perceptual processes). They can be asked to identify words that are particularly difficult to remember and helped to think of clues (developing personal memory strategies). Their attention can be drawn to how their own impulsivity leads to unnecessary errors and assisted to plan for different behaviour (self management). A sense of ownership of the reading process is promoted in this way and the thinking habits generated have wider applications.

Conditions for success

A supportive learning climate
There is substantial evidence that learning to think and learning to read, and indeed any learning, occurs most successfully in a learning climate in which teachers and learners feel that they are engaged in a shared enterprise in which each respects the other's role and expertise. The educator possesses cultural knowledge that must be mediated to the learners. Each learner is the expert on himself/herself, his/her current knowledge, his/her way of learning and his/her own context.

Together the group generates a mutually acceptable way of operating that enables learning and development.

The nurturing of cognitive dispositions

It is only in the above type of learning environment that the dispositions said to be typical of effective thinkers and learners are likely to develop. According to Tishman et al. (1995) the following dispositions (abiding tendencies towards patterns of thinking behaviour) are important: to be inclined to question, wonder, be curious, to think adventurously and explore alternatives, to reason clearly and carefully, to organize and be planful and to give time and effort to thinking. These are ways of being that can be *cultivated* in any classroom. They do not develop by prescription and they take time to evolve, especially when they are not the norm elsewhere. Under the right conditions, there are many opportunities within the teaching of reading to promote the development and refinement of thinking, a process that can only help to produce more flexible and insightful readers.

Conclusion

Sophisticated reading also involves more complex thinking skills such as reasoning by analogy, the making of inferences, the prediction of consequences, the generation of hypotheses and the acknowledgement of the need for acceptable evidence. Although these are crucial aspects of skilled reading they are not generally considered to be part of learning to read and are not discussed here in detail. But teachers should be aware that the Piagetian assumption that thinking of this nature emerges only in adolescence is now challenged. Vygotsky's position implies that, with mediation, children may be capable of much more than many people have expected of them and Bruner (1986) would agree. Lipman (1991, 1993) and Haynes (2002) maintain that even young children can 'think like philosophers' and develop as thinkers through doing so. There are opportunities for a creative teacher to do much more than just teach reading.

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