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Paper presented to the Annual Conference of the British Educational Research Association (BERA), September 2010, University of Warwick

Abstract. This paper reports some findings from the first three years of a longitudinal study designed to follow students' growth in literacy from the earliest years at school. A feature of the study was the use of quality children's literature, in the form of picture story books. These texts were the basis of instruments designed to investigate students' developing comprehension, their understanding and knowledge of narrative texts, and their skills in recognising, explaining and making connections with the themes and ideas in the texts. The selection of texts appropriate for these purposes has raised many points of interest, such as the complexity of themes and ideas that children can access from such texts, and the power of the visual images that play a central role in picture story books.

Context: A longitudinal study
Identifying effective strategies for assessing comprehension in the early years of school was a significant research focus in an Australian Council for Educational Research longitudinal study. This study was designed to follow students’ growth in literacy and numeracy from the commencement of primary school to Year 6, and also to develop understanding of the distribution of achievement in literacy and numeracy amongst children throughout the primary years.

A national cohort of 1000 students was established, from a random Australia-wide sample of 100 schools selected in proportion to population size for each state and territory. Ten students were randomly selected from each of these schools. The objective was to collect literacy and numeracy achievement data from these students each year from 1999-2005. Over time many students transferred to other schools, and where possible the principal of the new school was asked to agree to their retention in the study. Where the original school knew the destination of the moving student, this was possible, but the destination was not always known. Over the years, there was gradual attrition of the original cohort, but a significant proportion was retained until the end of the seven years.

Achievement data in literacy and numeracy were collected on nine occasions across the seven years of the study. In the first two years at school, data were collected at the beginning of the school year, and towards the end of the year. The literacy assessment approaches developed for the original longitudinal study, particularly the approaches taken in the first three years at school, have since been used in a number of major studies, and have been the model for other assessments. The assessment activities were structured to be administered by the teachers of the students involved.

The study was underpinned by the concept of developmental assessment, which involves the development of progress maps to describe typical progression of development in an area of learning over time (Masters & Forster, 1997). Locating students’ achievements on the same
scale makes it possible to describe individual development over time, or to compare the progress of groups of students. The scales used in this study were constructed using the Rasch model (Masters, 1982). The Rasch analyses involved identified aspects of literacy development that were assessed in items most students found easy, as well as items that were found to be difficult for most students. The literacy scales of developing achievement can be found in the monograph report of the first three years of the study (Meiers, Khoo et al., 2006).

Assessing literacy development
Planning a longitudinal study of students' development in literacy and numeracy from the time they entered school until they reached Year 6 highlighted a number of key research questions. What critical aspects of literacy should be assessed in each of the seven years in order to gather evidence of development over time? What aspects should be assessed in the earliest years? A specific question concerned the extent to which it was important to assess the knowledge and understandings young children have about characters, settings, plots, themes and ideas from story books read aloud.

The critical aspects of literacy on which data were collected during the first three years at school were as follows:
- Making meaning from text (comprehension)
- Reading fluency
- Concepts about print
- Phonemic awareness and alphabetic knowledge
- Writing.

The aspects of concepts about print, phonemic awareness and alphabetic knowledge were not assessed in the years beyond the first three years. More recent research (Paris, 2005) has affirmed the appropriateness of this decision. Paris categorised developing reading skills as constrained and unconstrained. In general, letter knowledge, phonics and concepts of print are highly constrained, phonemic awareness and oral reading fluency are less constrained, and vocabulary and comprehension are least constrained (Paris, 2005, p 187).

The assessments were conducted by teachers, in a one-to-one interview situation. In the course of the first three years data were collected on five occasions, using assessment instruments linked to a common scale. (The numeracy component of the study was parallel to the literacy component, but is not discussed in this paper.) The major focus of work in the initial stages of the study was on the development of valid and appropriate assessment instruments for students in the early years of school. At a later stage the data collected from these assessments were used to construct a scale, or progress map.

Comprehension: selecting texts and formulating questions
The intention of taking a comprehensive rather than narrow view of literacy development lead to the decision to include, from the very first year at school, assessment tasks probing students' understanding of the themes, ideas and information in picture story books, as well as tasks targeting their skills in recognising print in the environment, alphabetic knowledge, phonemic awareness, oral reading fluency, and writing. The inclusion of assessments of students’ comprehension from the very first year of the study ensured that this ‘unconstrained’ skill would be a feature of the literacy assessment throughout the seven years of the longitudinal study.
Quality children’s literature, in the form of picture story books, was included in the first five assessments. In the later years of the study, comprehension was assessed through students’ independent reading of a variety of texts. The use of the picture story books made it possible to gather data about students’ understanding of many aspects of narrative texts. These included skills in making inferences, in recognising, explaining and making connections with the themes and ideas in the texts, in understanding plot, setting, and characters. The selection of texts appropriate for these purposes has raised many points of interest, such as the complexity of ideas that children can access from such texts, and the function of the visual images that play a central role in picture story books.

The development of appropriate comprehension items required texts of that would engage students from a diversity of backgrounds, and that provided sufficient complexity to provide opportunities to ask questions that can be answered by stating information directly stated in the text, as well as questions that require students to make inferences and to reflect on how the text relates to their own experience.

**Evidence of a wide range of students’ understanding of texts**

The data showed that there was a wide range of responses to questions about the picture story books, indicating that some students had insights and understanding of the texts, while others found the comprehension tasks more difficult. For example, at the end of the first year of school, forty-three per cent of students in the sample were able to explain how the title of the story referred to the central idea, but another ten per cent were unable to explain this. Other data showed that, at the beginning of Year 2, seventy-one per cent of students could explain how a main character’s feelings changed, while twenty-three per cent were unable to explain this. Therefore, in order to probe the wide distribution of students' understanding, the selection of books with literary value and some complexity, covering themes likely to engage and challenge students, and convey meaning through both print and visual images, was essential.

The possibilities for formulating a range of questions can be illustrated in the case of the picture storybook, *Handa’s Surprise* (Browne, 1994), which was selected for the assessment instrument used at the end of the students’ first year at school. The book tells how Handa packs a basket of ‘seven delicious fruit’ to take to her friend, and her anticipation of her friend’s response: *Will she like the round juicy orange ... or the ripe red mango?*. The visual text, in the form of richly coloured illustrations, in close-up and more distant views, shows how first a monkey, then an ostrich and a succession of other animals, steal the pieces of fruit without Handa being aware of what is happening. Eventually, the basket is completely empty. The written text makes no reference to the animals. The turning point of the story comes when an untethered goat butts a tangerine tree just as Handa is walking beneath, and the falling tangerines fill her basket. The story ends as the two friends exclaim about two different surprises: for the friend, the gift, and, for Handa, the contents of the basket.

This text had some complexity, in that it explored the concept of a ‘surprise’ and the theme of friendship. It also positioned the reader/listener/viewer as being more informed about events in the story than the main character. The storyline included a key event that changed the course of events, and a conclusion that provided a happy ending. The plot was simple, but interesting, the characters were strongly drawn, and the setting was populated by mischievous
animals. A variety of kinds of questions was included in the assessment instrument, focused on different aspects of the text.

Firstly, each student was asked to tell the teacher ‘what happened in the story’. The retelling was followed by some more specific questions. The first of these focused on the book title, and asked the student to explain the central point of the story: The book is called Handa’s Surprise. Why is Handa surprised? In response to this question, forty-three per cent of students in the sample demonstrated their understanding that the new fruit in Handa’s basket was a surprise, eleven per cent identified the friend’s surprise, while another ten per cent seemed to miss the point, referring to the animals taking the fruit.

The pivotal event in Handa’s Surprise involving the goat butting the tree was portrayed solely through a sequence of four illustrations. The fourth is a full page spread showing the goat butting into the tree and the fruit falling into the empty basket on Handa’s head. This provided an opportunity to gather information about students’ understanding of visual information, as well as their more global understanding of the place of this episode in the context of the whole story. The book was opened at the sequence of illustrations, and students were asked What’s happening in these pictures? The responses showed considerable variation. Sixty-two per cent described the goat breaking free, butting the tree and knocking fruit into Handa’s basket, fourteen per cent commented only on the goat butting the tree and the fruit falling, without mentioning the goat breaking free. A second question about these pages asked: Why is this important in the story? Twenty-seven per cent recognised the significance of the falling fruit, indicating their understanding of the centrality of this event to the whole story, but another twenty-five per cent described the action in the picture without explaining its importance.

During Term 2 of the students’ third year at school, another set of data was collected. This was the last occasion when a picture story book was read to students for the comprehension element of the assessment. The book selected for this year level was The Deep, by noted Australian author, Tim Winton. The written text is more extensive and complex than the books selected for earlier years. The text is superimposed on the illustrations which serve several purposes, including establishing the detail of the beach setting, highlighting the main character’s emotions, and conveying the feel and movement of the water. The central dilemma is that Alice, the main character, is afraid of swimming in the deep, even though ‘… she wasn’t scared of many things.’ The main theme is the way Alice overcomes this fear, with the help of dolphins. When swimming with the dolphins, she finds that ‘the water was like a silk sheet around her…’.

There are many opportunities for formulating questions that invite students to respond to the ideas and feelings in this story. The question, How did Alice learn to swim in the deep? can be answered simply, by direct reference to the dolphins, but a more complex answer makes the connection between the fun of swimming with the dolphins, and the way they made her forget her fear. This question requires an understanding of the whole text, and making connections between the descriptions of Alice’s fear, and the confidence she exhibits at the end of the story: ‘Then she turned around and swam back out to the others.’ Fifty-five per cent of students referred to the dolphins making her forget her fear, while twenty-five per cent made reference to the dolphins, but were unable to elaborate.

At the beginning of the story Alice is afraid of the deep. What else is she feeling in this picture? This question refers specifically to the double page illustration where Alice is
watching the rest of her family swimming and diving. The written text states, ‘But, she was afraid of the deep.’ The close up view of Alice shows the complexity of her feelings, as she looks over her shoulder, perhaps enviously, towards the members of her family in the water. Sixty per cent of students identified a plausible emotion other than fear and explained their reasons for saying this, and sixteen per cent identified a plausible emotion other than fear but gave no explanation.

Another illustration prompted a specific question on a visual feature, a shadowy shape of octopus tentacles in the water, expanding on the written description of the ‘… beautiful… greeny-blue… deep…[water]’. Students were asked: Look at this (indicate blue ‘octopus’ shape). Why do you think this is here? Responses to this question showed considerable variation in students’ capacity to interpret the visual image. Forty-one per cent suggested that Alice was imagining that the deep is filled with dangerous creatures, and another thirty-five per cent described the purpose of the visual image being to illustrate a detail about the sea.

To fully understand this story, readers need to understand meaning not directly stated in the written and visual text. One double page spread shows a close-up picture of Alice swimming beside two dolphins, looking completely happy. Two pages further on, she is still in the water, but her expression has changed, her eyes are shut, her face is tense. The text states ‘Alice went stiff. Suddenly, all she could think of was the great darkness below.’ The question posed to collect data on students’ understanding of what is not directly stated the student to two contrasting events in the story: Alice is happy to swim in the deep here. (Turn 2 pages) Why is Alice afraid again? Seventy-one per cent of students provided answers that showed their understanding that, in the midst of her enjoyment, her brother’s comment about her swimming in the deep brought back her fear of the deep.

Writing about stories: students’ responses

The students’ writing also demonstrated the range of their responses to the picture story books. In each of the five assessments, the picture story book was used to provide a prompt for writing. Following the reading and discussion of Handa’s surprise, students were asked to write about the illustrations showing Handa’s arrival in the village: Write about this part of the story. Write about what is happening. One student wrote two sentences summarising the main action of Handa giving Akeyo a surprise, and a comment on Akeyo’s wave, referring to a specific visual detail. (Original spelling and punctuation retained.)

Handa is giving Akeyo a surprise. Akeyo is waveing her arm to Handa.

The prompt for writing about The Deep was: Write about what happened in The Deep. This piece from one student is focused on key events, shows understanding of the role of the dolphins and the brother. It also provides insights into Alice’s wish to swim in the deep, and her fears. (Original spelling and punctuation retained.)

A girl named Alice was afaed of the deep but she really wanted to go out in the deep. One day she sor some dolphin in the showl and started to go out to the deep .. and then she frose … her brother got her hand her and pulled her up then bring her to the shawl. Then she waset afaed of the deep any more. So the day after she went out on the yete and jumped off.
The place of picture story books

The findings reported above remind us of the ways in which literacy development is connected to children’s experience with texts in many contexts. Children’s literature is a central element of school curriculum, and can play a significant part in expanding children’s knowledge and experience, as well as helping them to grow into appreciative, questioning, and confident readers. In the ACER longitudinal study, the instruments that were used to gather data about comprehension enabled students to demonstrate a wider range of literacy knowledge and skills than is possible in less comprehensive assessments. The picture story books used in this study combined visual and print text in a variety of ways, and provided a highly appropriate context for asking a wide range of questions.

Next steps

The literacy assessment instruments used in the ACER study from 1999-2005 have recently been extensively revised and reshaped, for use in future ACER studies. This revision was informed by the data and analyses from the original longitudinal study, as well as from several other major research projects in which the set of five linked literacy assessments spanning the first three years at had been used. In the course of the revision, questions about the use of children's literature in the form of picture story books have been re-examined.

The preparation of a new set of literacy assessments based on the detailed revision involved several stages. Data from previous projects in which the original assessments had been used, including the main longitudinal study, were reviewed. The purpose of this review was to determine how effectively the items used in those assessments had captured evidence of the distribution of achievement amongst students in the different samples. The most effective assessments included items found to be easy for most students, as well as items found difficult by many students. The picture story books selected were re-examined, to identify the range of opportunities they provided to ask questions requiring literal interpretation, inference and reflection. A number of original picture story books which had been developed for some commissioned early years literacy assessment projects modelled on the approaches used in the LLANS were also reviewed, and the extent to which they offered opportunities to ask questions about significant aspects of developing literacy.

The review of literacy assessment items probing students' understanding of literary texts read aloud affirmed the initial inclusion of such tasks in a comprehensive literacy assessment. Access to data from previous projects clarified the nature of the evidence of student literacy achievement. Other data informing the review included feedback from teachers who had administered the tasks, and their reports of students' responses to the activities. The assessment tasks in the study provided a range of information about students' varied responses to literacy texts, indicative of the foundations for the continuing development of informed, appreciative and evaluative responses throughout schooling.

Instead of commercially available picture story books, new picture story books have been commissioned for further longitudinal studies so that the instruments can be held secure for these ACER research projects. The research team formed an editorial review committee, and liaised with writers and illustrators during the drafting and editing of these books. The analysis of data from trialling of the new items will determine the quality of the items, and the spread of students' achievement.
An interesting finding has been that it is possible to develop effective questions about vocabulary in the context of reading these books. The picture story book, *Clever Chen*, produced for students in the first term of their first year at school is a re-telling of the traditional tale of the pedlar’s caps (Recht & Darkin, 2010). The main character first became aware of a group of monkeys when he heard ‘chittering and chattering’. The question focused on this phrase asked about the writer’s choice of these words: ‘Why do you think the writer used the words ‘chittering and chattering’?’, and was intended to collect data on the proportion of students who could recognise a link between the words and monkey sounds.

The picture book written for older students, at the end of their second year at school, is titled *The Reluctant Spy* (Fraillon, 2010), and features a main character who is weighed down by her family’s expectation that she will follow family tradition as a spy. The book has many fantastical elements in realistic settings. A direct question was asked about the meaning of a word: ‘“Instead of having fun in the holidays, Penelope had to sift through endless documents.” What does sift mean in this sentence?’ The written text appears at the foot of a full-page illustration with the character reading in the light of a desk lamp, in a gloomy room filled with piles of books and papers. The visual text provides context for deducing the meaning of the word.

Both these new books use the visual text to convey significant information, and thus can be used to gather evidence of how the students make meaning from combinations of visual and written information in these multi-modal texts. For example, a turning point in *Clever Chen* is shown through the illustrations, when the monkeys are seen to be copying all Chen’s movements in a sequence of three illustrations across a double page. The text under each of the illustrations says nothing about what the monkeys are doing, but tells the reader: ‘Suddenly, he had an idea.’ This leaves the reader to make the connection, and created the opportunity to ask: ‘Show me the part when Chen first got the idea about how to get his hats back.’

The text towards the end of *The Reluctant Spy* simply says: ‘Together, they set a trap.’ The details of the trap are contained in the very detailed full page illustration, and the outcomes of the plan, which are the climax of the whole story, are shown on the facing page. The question, which requires interpretation of visual information, and of a whole sequence of activity, prompts the question: ‘What was the plan to catch to catch the thieves’.

**Qualities of pictures story books**

The work on developing assessment instruments intended to gather a rich picture of many aspects of literacy achievement in the early years at school has led to the development of a set of criteria for selecting picture story books that possess the qualities appropriate for the purpose:

- literary quality
- well-developed characterisation, settings and plot
- complexity and depth of themes and ideas
- engaging and challenging for students
- meaning conveyed through print and visual images
- inference and reflection as well as literal interpretation
- connections to personal experience.
Where students can be engaged in questioning texts that have these qualities, it is possible to gain valuable insights into a wider range of the strategies that readers in the early years at school use when they are responding to multi-modal texts. The knowledge gained from the data generated in this questioning process can then be used to inform and shape future teaching practice, and support students’ literacy development.

References


