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How Effective are Print-Based Comprehension Models for Reading and Assessing Multimodal Texts?

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ABSTRACT

The presentation of texts within a school environment has traditionally been heavily weighted towards print-based media. Outside of this environment, students are increasingly exposed to multimodal texts as a result of a greater reliance upon, and use of, electronic communication technologies in their daily lives. It may appear that students are fluent in the control of these technologies, but this may not necessarily equate to adequate comprehension of the texts being presented by these technologies. This paper examines the role and potential effectiveness of a 'traditional' model for comprehension of print-based texts (Here-Hidden-Head) when applied to the comprehension of a digital multimodal text.

Introduction

Over the last decade there has been growing interest and research into the difference between reading print-based texts and multimodal texts. Due to the relatively recent and rapid emergence of multimodal texts as a major function of communication in daily life, the reading processes involved in comprehending these texts have been compared to the more 'traditional' reading processes needed to comprehend print-based texts (Walsh, 2003).

The obligation to engage with multimodal texts in the classroom setting is increasing as these texts become more commonplace through the use of electronic communication technologies and lifestyle tools used by students entering the classroom.

Teachers need to become fluent in their comprehension of multimodal texts and embrace their use in the classroom in order to maximise the learning opportunities for their students (Makin, Diaz & McLachlan, 2008).

Although some complaints are made by teachers of feeling 'left behind' as the requirements of, and training for, multimodal technologies increases, many comprehension traditions remain in a modified form easily accessible to teachers. Instead of students traditionally sitting around a book during quiet reading time, they now gather silently around an iPod and share meaning through significant music or video clips.

Our task then, as teachers, is to assess if students are able to comprehend the multimodal texts they experience, and if they can 'get at' the meaning within these texts. Can traditional models used to assist in comprehension of print-based text be applied to multimodal texts and do these models provide measurable data to inform teaching practice?

Objective

Literature supports the understanding that there are differences between print-based and

multimodal texts, and some excellent frameworks exist to demonstrate these differences (Anstey & Bull, 2006). There is a wealth of literature promoting the importance of incorporating multimedia texts into the classroom curriculum, and these publications also describe outstanding learning opportunities that engage students in a constructive and enjoyable manner that justifies their vital role in the curriculum. Less commonly published are attempts to discover measurable evidence of effective strategies for helping students to master comprehending multimodal texts. This paper is a result of an attempt to gather 'hard data' on assessing comprehension of multimodal texts in the same way that traditional print-based texts have been assessed. With this information, teachers with little or no experience of multimodal texts can be encouraged to participate in exploring these options with the knowledge of gaining adequate assessment to inform their teaching practice, while those teachers with multimodal fluency can use this platform to further develop the total pool of evidence accumulated in this field. Without some attempt at assessing student comprehension of multimodal texts from both ends of this spectrum of teaching, there is no difference between ignoring the student with traditional reading difficulties who has the skills to flip the pages of a thick novel to mime 'reading' to avoid detection, and ignoring the student with multimodal reading difficulties who uses ICT skills to browse complex online content to mime 'reading' and avoid detection.

Literature review

Before discussing multimodal texts in detail, it is worth zooming out and remembering the bigger textual and contextual setting in which multimodal texts reside. During any given day, students are exposed to one or more of the five semiotic systems described by Anstey & Bull (2006, p. 25), sometimes simultaneously. The five semiotic systems are:

- Linguistic:** oral and written language, for example, use vocabulary and grammar
- Visual:** still and moving images, for example, use colour, vectors and viewpoint
- Auditory:** music and sound effects, for example, use volume, pitch, and rhythm
- Gestural:** facial expression and body language, for example, movement, speed and stillness
- Spatial:** layout and organisation of objects and space, for example, proximity, direction and position.

Far from being a dull environment, the classroom is actually a constantly dynamic and intense mix of these systems, all of which require intense concentration and understanding on behalf of the students and teachers in order to make communication and exploration of ideas and learning possible. While most students and teachers would be able to 'read' meaning in the tone of voice, body language or facial expression of another member of the class with relative ease due to years of practice, these skills do not automatically translate to accurately 'reading' the meaning in multimodal texts such as the meaning behind the use of colour in an image or in determining the accuracy of web content (for an example of a bogus webpage for students to assess, go to: www.dhmo.org). This knowledge/skill translation gap becomes even more extreme and relevant when multimodal texts are used as the primary learning object and assessment tool.

At this point it is worth defining what is meant by a multimodal text. Walsh (2003, p. 3) describes multimodal texts as:

texts that have more than one 'mode' so that meaning is communicated through a synchronisation of modes. They may incorporate spoken or written language, still or moving images ... and incorporate sound.

A good example of a multimodal text could be a television documentary, a computer game or an on-line social networking site.

From very early days of the advent of exposure to multimodal texts, educational researchers understood the potential impact that these texts could have in achieving the learning outcomes of various curriculum topics. Makin, et al. (2008, p. 57) summarises this awareness:

Literacy is changing and young children are increasingly exposed to communication tools and situations that are multimodal rather than exclusively linguistic. This has required new thinking about the new forms of literacy ... computers are 'symbol machines' that allow children to negotiate a complex interplay of multiple sign systems, multiple modalities, recursive communicative and cognitive processes ... literacy is not simply a question of print-based versus electronic or digital literacies, but consideration of multimodal contexts.

It was often at this stage that teachers either chose to avoid dealing with multimodal texts due to a perceived complexity in either their understanding and operation or their management for assessment purposes (the 'boggle factor'), or embraced them wholeheartedly to various degrees of proficiency. If we set aside training, IT support and resource availability and focus purely on the texts themselves, then many of the tools and techniques that have proven their merit in the historical arena of written assessment could be used as a foundational approach to multimodal texts.

Establishing a simple, effective tool for assessment was crucial to the success of the research, given the complexity of the texts available. Fountas and Pinnell's (2006, p. 42) *Systems of Strategic Actions for Processing Text* was chosen as the starting point. The system is summarised as:

Thinking within the text: Searching for and using information

Thinking beyond the text: Making Connections; Synthesising

Thinking about the text: Analysing and critiquing

This system was tested on students throughout the first Term of the year with numerous modifications from a variety of sources and rewording until it made sense to the students and they were proficient with its use when reading or writing. The final modified version (Here-Hidden-Head) appeared to students as:

HOW DO I FIND THE ANSWER TO MY QUESTION?

HERE The answer is found right there in the text and sounds a lot like the question

HIDDEN The answer may be found in parts scattered around the text and may paraphrase the question

HEAD The answer is not written on the page and requires me to make connections with my own experiences or opinions

Data collection

Data was collected for this project through a series of assessment task sheets tailored to each episode of a series of online adventures in a series called Inanimate Alice at: www.inanimatealice.com. Each episode task sheet consisted of 28 questions divided into four sections. The first three sections were grouped according to the Here-Hidden-Head categories of questions to allow for comparison of comprehension within and across these question types (see Appendix 2).

The purpose of these sections was to provide a way to map levels of comprehension within a given episode in relation to the complexity of the questions themselves, and then to map

any variation in comprehension in relation to increasing demands of more complex episodes (see Appendices 3, 4a and 4b). The fourth section provided an opportunity for students to critically reflect upon the functionality and appeal of the website. The purpose of this section was to explore if comprehension was affected by expertise, interest or enthusiasm.

Data collection took place over five weeks using one lesson per week where all students had access to a personal computer at the same time.

Only 21 students in the class were available to complete all episodes due to daily absences or changes to timetabling with specialist lessons. Of this sample, 11 students completed all tasks but only handed in some of the completed task sheets.

Classroom setting

St Francis de Sales College is a dynamic co-educational College of 950 students situated in the beautiful Adelaide Hills at Mount Barker. St Francis de Sales offers exciting opportunities to meet the needs of our student community by giving them a focus on personal learning and promoting a clear sense of self worth and well-being. We take as our model St Francis de Sales, who, as a result of his practical spirituality, envisioned a world where all people are capable of achieving their goals and positively influencing the world in which they live.

The classroom setting in which the lessons took place consisted of 28 Year 5 students between 10 and 11 years of age. The group was evenly divided between boys and girls. Four students had identified learning difficulties and received funded support in the classroom and through external programs run by the College. Three students operated in the gifted and talented spectrum.

All students had access to a computer at home and used it on a daily basis for research or communication with peers through Facebook and/or MSN. Approximately half of the students had a mobile phone that they used daily to text family or friends and approximately one third of the class had an iPod or iPhone that they used daily to contact family or friends and to share resources. Four students had all of the above technologies and also used them daily and *simultaneously* while at home for communication with family and friends and to share resources.

Nearly all students in the class carried a USB with them at all times to store projects and swap music and images with friends and teachers. All students estimated they spent approximately 3 hours a day using electronic communication technologies. The incidence of cyber-bullying between students was low, and students had a well developed peer network for identifying suspicious characters appearing in chatrooms. Whenever possible at College, students enjoyed spending free time sharing free online games with each other or sharing music and playing games using phones or USBs.

It was a common scenario for friends to ask to 'catch up' with one another, by sharing a headphone splitter amongst a group and all standing or sitting in silence with an earpiece while they take it in turns listening to one another's playlists on their phones or iPods.

A recent trend in the class following this project was the design and construction of model laptops and mobile phones using cardboard and paper for role-playing during free time in the classroom. Models rapidly became increasingly complex as students added apps and other functions to their cardboard models and changed the skins of their models to retain the most advanced version in the class and to distinguish the various friendship clubs according to the make and version of their tools. Once again, students commonly created a collection of devices including phones, laptops and gaming consoles. Students reached the point where, instead of getting into trouble for passing secret notes to each other, they would get caught 'logging on' to their cardboard models and texting one another. One

student even attempted to transcribe lesson notes on the model rather than write in a book!

Given this environment, it was assumed that the students were fluent with the ICT operating skills and technologies used to play online games on the College desktops.

During the first term of the year, it became obvious that the majority of students in the class were highly proficient at answering here-category questions in reading, viewing and listening tasks and placed great weight on feeling successful in comprehending texts by scoring highly in this category. As a class, students were less confident at searching for the answers to hidden-category questions and appeared to lack any ability or experience to answer head-category questions with any fluency. As a result, students believed they were doing really well at English when given simple comprehension tasks, and quickly became discouraged or despondent when faced with more challenging tasks that reflected an appropriate standard for Year 5. At this point, lengthy guided conversation could extend some students into basic head-category questions and answers, but the students would quickly lose interest in the discussion.

In response to this situation, a concentrated cycle of direct instruction activities began during English lessons that allowed students to understand the different question categories and to practise their fluency in answering and formulating these questions (see Appendix 1). Individual work, small guided groups and whole-class activities in reading, writing, viewing and speaking allowed students to become familiar with the Here-Hidden-Head approach to comprehending texts.

These activities began to prove useful and produced some measurable improvement in the use of this model, as reflected in the variety and complexity of questions asked and answered. However, the activities were highly labour-intensive and were restricted to unimodal texts and traditional tools and techniques. Students would spend a lesson working through a handful of questions regarding a half-page text at a moderate pace and then move into working with multimodal texts at a high pace from various personal ICTs. The transition between these two ways of comprehension raised the question as to how effectively students were comprehending texts in both environments and whether or not the Here-Hidden-Head model could be used as an effective tool for assessing comprehension of multimodal texts.

Reflection on results of action

In summarising the data collected from this project, the key areas of focus were: student interest levels (did they like the text?), rating descriptors (how much did they like the text?), task completion (were they able to complete the text?) and comprehension (did they understand the story they were involved in?)

Student interest

The students involved in this project all showed a great interest in the unit of work and, as Figure 1 shows, increased their level of enjoyment with every subsequent episode. This is a fascinating result, given the expectation that as comprehension demands increased due to increasing complexity and sophistication of episodes, enjoyment and participation would decrease as the task of completing the comprehension sheets became a distraction or burden. Some possible reasons for the overall increase in enjoyment of this multimodal text could be that increasing familiarity with the text allowed for greater fluency in comprehension and navigation skills, that the increasing demands of the text raised interest levels correspondingly, that teacher attitude and preparation for the unit of work generated interest, that peer encouragement and competition generated interest, that comprehension demands decreased as gaming element increased, causing less compulsion to engage in the activity and more

compulsion to just play, or a combination of one or more of any of these possibilities. All options raise a range of interesting future research topics for consideration.

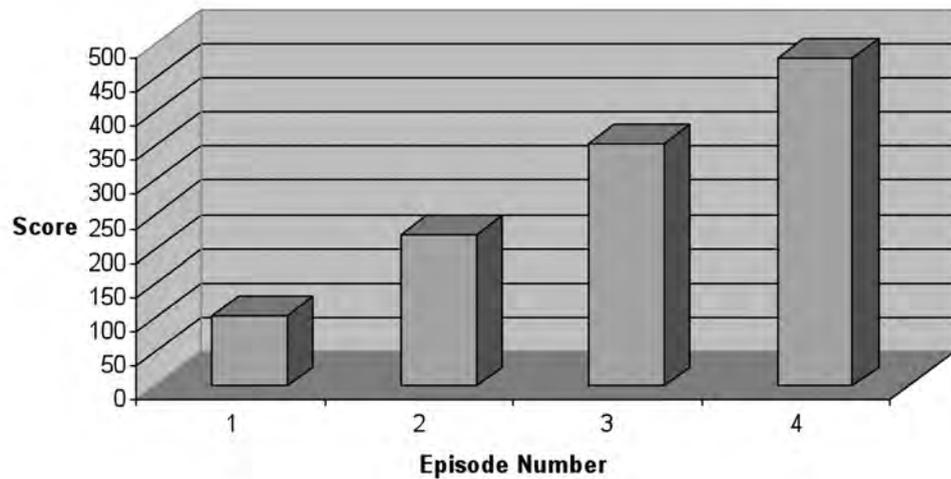


Figure 1. Student approval rating of available episodes

Rating descriptors

Student rating descriptors gave an indication of how well the text was accepted into the students' image of an English comprehension task, and their awareness of different modalities. For high levels of enjoyment, descriptors included: interesting, spooky, fun, awesome, cool, good, very good, excellent, wow, best of all, 400/10. Rating descriptors for moderate enjoyment levels were: realistic, made excitingly, music makes it real, pictures and music make it feel like you're there, fun to watch, each episode gets better, gets more detailed. Rating descriptors for low enjoyment levels were: gets better with more games, simpler story is better, lots of writing, scary, boring.

In examining the descriptors against the overall marks achieved by the students, those with good comprehension skills continued to rate the game highly, while those that struggled to comprehend the game rated it poorly even when demands on comprehension decreased.

What the data could not collect was observational influences. Of particular note are the following two examples. The highest rating was made by a student with Asperger's Syndrome and a fascination for computers. The effort put into answering and completing tasks was way above this student's normal output in the classroom, and gave a better understanding of his comprehension levels and fluency in problem solving and ICT skills. He would get gradually more and more excited as the week went by until the Friday computer lab lesson. In each lesson he was overjoyed that he was the first to complete the tasks and to score highly with most or all of his answers. This one lesson a week gave him the sustenance he needed to make it through the other four days of paper-based output. One of the lowest ratings was made by a student with extremely high comprehension and navigation skills, but who was genuinely scared by the sounds and imagery associated with one episode.

Task completion

Task completion achievement was high throughout the series of episodes (see Figure 2), with darker bars indicating high achievement of all tasks, lighter moderate achievement of all tasks, and white low or no achievement of all or some tasks. Episode 3 stands out as the demands on being able to comprehend the text increased dramatically. In all other episodes, most tasks were completed successfully.

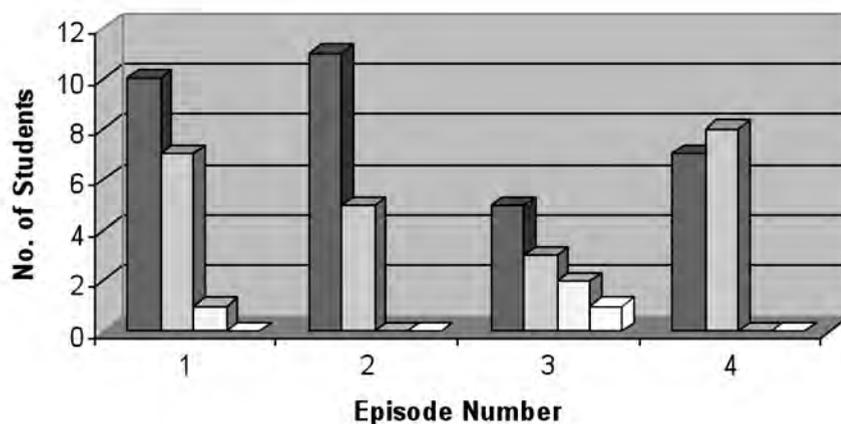


Figure 2. Task completion of available episodes

Comprehension

In Episode 1, students are introduced to the basic outline of the series of episodes and experience the multimodality of the text and the complexity of the language used in the text. It is also the first opportunity for students to participate in an independent comprehension task using the finalised Here-Hidden-Head model. What can be noted is that comprehension decreased as students worked their way from the simplest ‘Here’ questions to the complex ‘Head’ questions (see Figure 3). There is a general movement across the skill range from darker high proficiency bars into the lighter and white moderate to low proficiency bars, although students are persisting with completing the task sheets.

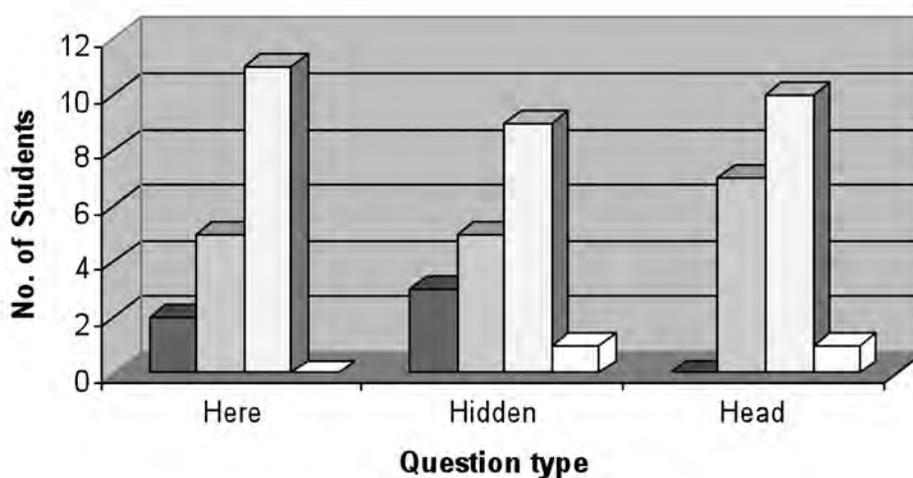


Figure 3. Episode 1: China

In Episode 2, students have some familiarity with the multimodality of the text and the expectations of the comprehension task. The slightly greater comprehension demands of this episode show up in the centralised results of good to moderate proficiency skills, with a slight improvement in overall skills across the set of questions (see Figure 4). Once again, student persistence with task completion is evident, and results have improved in the ‘Head’ questions in comparison to Episode 1.

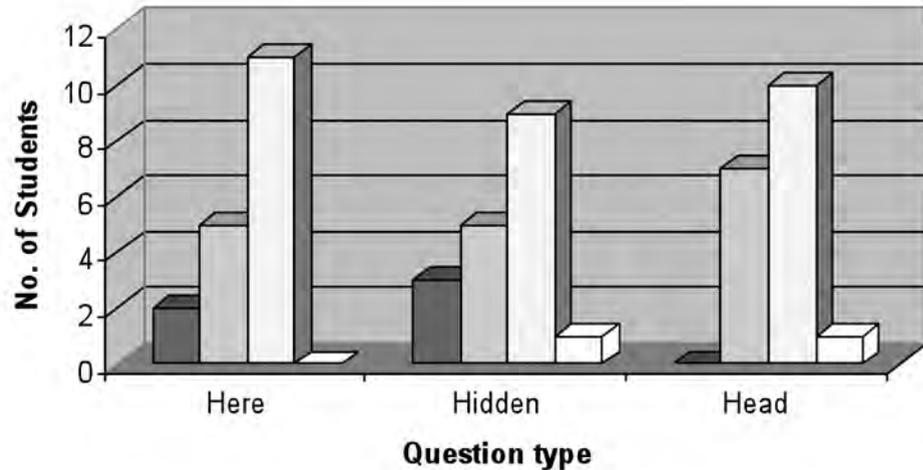


Figure 4. Episode 2: Italy

In Episode 3, students have become fluent in the multimodality of the text and the expectations of the comprehension task, but are faced with more demand on their comprehension than before, with the requirement to complete two games that occur simultaneously during the reading of the text and determine the reader's ability to progress through the text. Visual, auditory and spatial semiotics are highly complex and have evolved dramatically from the first episode. Less than half of the total number of students to participate in the unit of work actually handed their work in, and those that did, showed a range of proficiencies and a lowered persistence to complete the task sheet (see Figure 5). In most cases, students did not have the time to complete the task sheets in accordance with the occurrence of events in the episode, due to the high demands of concentrating on the games to progress through the episode.

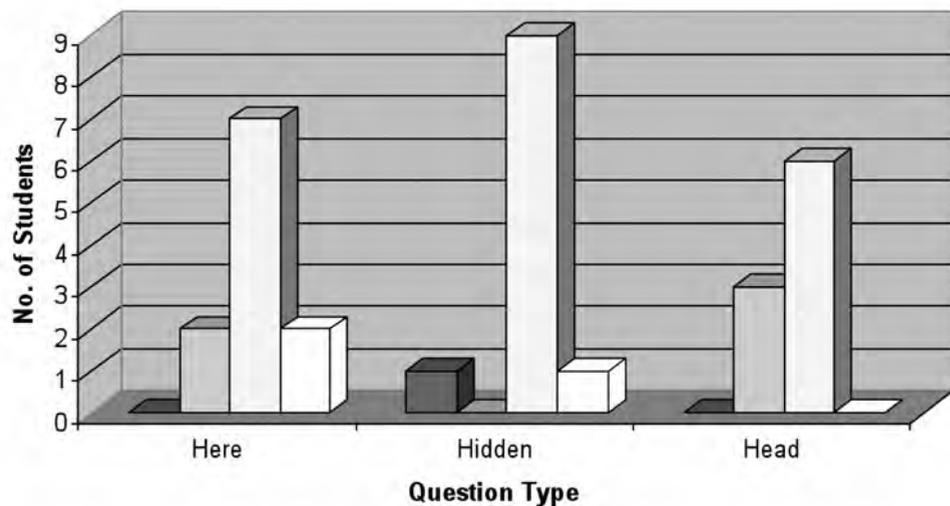


Figure 5. Episode 3: Russia

As students reach Episode 4, they have to complete the longest and most complicated and visually rich episode of the series, as well as the most demanding task sheet of the unit. Proficiency fluctuated around the moderate to good range (see Figure 6). While the tasks are very challenging, the episode itself is more 'relaxing' in that it is slower paced and without the gaming demands of the previous episode. Student participation and completion is higher, and persistence across the range of questions was strong.

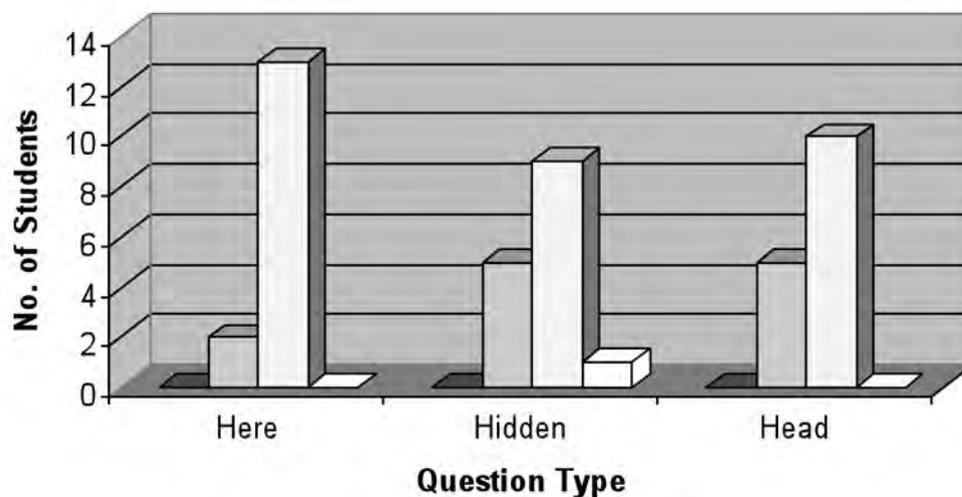


Figure 6. Episode 4: Hometown

Conclusion

This project arose out of an attempt to find out if traditional print-based comprehension models could be applied to a multimodal text. The desire to discover to what extent this application could be used to assist students in their understanding of the text and to assist teachers in assessing student comprehension of such a text raised as many questions as it answered.

What it did produce was a mountain of hard data for analysis, as well as a way of contemplating the use of multimodal texts as an assessment tool for specific outcomes within a curriculum area. The inability of the project to incorporate observational data meant that some of the more dynamic and informative results were excluded, particularly in the area of synthesis and evaluation. The Ministry of Education (2006, p. 84) states:

An effective teacher ... asks questions that require students to explain their choice of language in their writing or to think critically or reflectively about texts. In responding to such questions, students learn to link their thinking about texts with their knowledge and experience ...

What was of great interest from observing the students was the way that the task sheets generated discussion around the realisation that they were improving their comprehension of this multimodal text as they shared ideas and reasoning behind their choice of answers and navigation skills throughout the series. These discussions and group collaborative learning are probably of equal importance to the individual results produced from answering the task sheets.

In most cases the 'Head' questions were the most challenging as they required cumulative knowledge and understanding of the series, and because clues within each episode became harder to locate. This could actually show that comprehension fluency using this model was improving, as results began to stabilise as episodes progressed, indicating that skill improvement was keeping pace with increasing demands on comprehension.

What is clear from these results is the following:

- Multimodal texts require more demands on comprehension than print-based texts.
- Students transfer attitudes towards print-based comprehension to multimodal comprehension attitudes.
- The use of print-based strategic actions can assist with comprehending multimodal texts.

- Multimodal texts can be assessed using traditional methods.
- Incorporating multimodal texts into strategic action practice provides an additional opportunity or tool to prove and improve comprehension skills and fluency with strategies for print-based texts.

Continuing the comparison between old and new learning environments, the silent socialising using shared music for social bonding would make a fascinating research topic, as would the function of ICTs in role-playing and in substituting and fulfilling ‘traditional’ role-playing objects and activities during free time and activity sessions.

Teachers new to the profession can enrich the teaching environment through the use of multimodal texts. Teachers with well established careers of teaching to written texts can bring a wealth of comprehension assessment expertise and meaningful data collection to these new practices and allow them to enrich the learning environment. Regardless of personal preference, historical exposure and fluency, all teachers can ensure that they create an accurate picture of the comprehension abilities for each individual student across a range of experiences in a valid, meaningful and authentic educational experience.

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Appendix 1

Example activities to familiarise students with the Here-Hidden-Head model of comprehension during first Term.

- **Daily Newspaper Articles** Read and discuss. Answer set questions.
Develop own sample Here-Hidden-Head questions.
- **Comprehension Texts** Read a sample article and complete the set questions from photocopied worksheet.
- **Small Reading Groups** Read and discuss a text with peers and teacher.
- **Behind The News** Take notes from each episode to formulate questions for use in weekly class quiz competitions.
- **5 Minute Hot Seat** Three random topics written on board for student to choose and discuss with class.
- **Book Review Postcard** Create a postcard for someone with an illustration about a text and write to the recipient about the text.
- **10 Minute Buddy Chat** Sit with a partner and share about the weekend/day by responding to the partner's questions.
- **Journal Writing** Students given an incomplete illustration with the first line of a story about the illustration and have to complete the illustration and the story.
- **Argue Against** Students list all of the things they feel passionate about. Individuals then argue against these things while taking questions from the audience.
- **Tell Me How** Students try to instruct each other how to do a simple activity or explain a simple event or how a piece of technology works.
- **The Ultimate Why** In pairs, one student says something, the other student keeps repeating why to every answer until a stalemate is reached.
- **Alien Translator** Two students sit on chairs. One is an alien who knows the answer to everything but cannot speak any Earth language. The other student is the translator for the alien. Audience asks questions, and translator explains alien's funny sounds. Roles reverse before a new pair replace them.
- **What Was The Question?** A statement which explains or answers something is given and students have to create the question that matches the statement. Bonus points given to questions that don't include phrases from the statement.
- **Fat vs. Skinny Questions** Skinny questions are closed (yes/no, single word answer questions). Fat questions are open-ended and require sentences or short paragraphs to explain.
- **Celebrity Heads** Students try to guess secret identity by asking audience questions about the identity.

Appendix 2

Sample question sheet

Inanimate Alice

Inanimate Alice tells the story of Alice, a young girl growing up in the first half of the 21st century, and her imaginary friend, Brad. Over 10 episodes, Alice grows from an 8 year old living with her parents in remote northern China, to a talented mid-20s animator and designer with the biggest games company in the world.

Episode 1

HERE (*information is clearly stated in the text*)

1. How old is Alice?
2. Where in the world is Alice living?
3. What does Alice's Dad do for his job?
4. What is the name of Alice's Mum and what type of work does her Mum do?
5. Who is Brad?

HIDDEN (*information may be found in different places in the text*)

1. Alice doesn't go to school and is far from any towns. How does she spend time with her friends?
2. What sport does Brad like to do?
3. Describe the landscape where Alice lives.
4. Why does a photo and a map of Alice's house help you understand where she lives?

HEAD (*information relies on you relating your own experiences, knowledge and opinions to events in the text*)

1. Why does Alice get frightened in the car when they are looking for her Dad?
2. What feelings did you have while playing this episode?

WEBSITE ASSESSMENT

1. The website designers have tried to make this webstory interesting. List the things that make this episode more exciting than just reading a book.
2. What computer skills do you need to play this episode?
3. How would you rate this episode? Give your reasons.

Appendix 3
Screen grab of the homepage for Inanimate Alice



Appendix 4a

Screen grabs from various episodes of Inanimate Alice,
showing the multimodal requirements for comprehension



Appendix 4b

*Screen grabs from various episodes of Inanimate Alice,
showing the multimodal requirements for comprehension*

