A 'computer tutor' to assist children develop their narrative writing skills: conferencing with HARRY

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Abstract

The purpose of this study was to test the hypothesis that a computer tool can change the way children approach the task of writing and improve their writing performance. HARRY, a web-based computer tutor, provides a Vygotskian-like scaffolding of the knowledge transforming mature writing process and presents it to children individually in a conference situation. The effects of the computer tutor are analysed by comparing stories produced by three children of varied writing ability, who wrote a control and a HARRY assisted story, and by observing the children as they wrote. A control group also wrote two stories without receiving assistance for either story. The study's hypothesis was confirmed. With HARRY's assistance, the children wrote better stories and employed the revision process characteristic of mature writers. Vygotsky's work suggests that children will learn to adopt the mature approach from repeated use of the system and that the scaffolding should be reduced gradually. However, as the system relied upon the children's willingness to first request, then act upon the available guidance, the system would benefit from further development to ensure children interact sufficiently with HARRY.

Keywords: writing models, intelligent prompting

1. Introduction

Writing is recognised as a craft and the teacher, as the more experienced craftsperson, has the role of explaining to pupils the skills of the trade (Graves, 1983). Many primary teachers perform this task by *sharing* and *guiding* writing with the whole class prior to the children writing. Using dialogue, they demonstrate the thought processes that are involved in the task whilst explaining literary techniques specific to the genre. In addition, many teachers provide pupils with feedback concerning grammar weaknesses such as spelling mistakes, places where full stops and commas have been omitted, basic sentence constructions, and repetitive or simple vocabulary.

HARRY, a web-based 'computer tutor' for narrative writing, is currently being developed to assist teachers in communicating effective narrative writing skills, by delivering a structured dialogue which *shares* and *guides* story writing with children individually as they write, in a conference situation, followed by editing feedback suggestions. This would be of benefit to teachers, for although conferencing with children individually is recognised as a profitable approach, constraints such as lack of time and large class sizes deter teachers from performing individualised tutoring themselves. Furthermore, pupils react more favourably to individualised assistance from computers than from human tutors. Zellermayer et al., (1991) noted how working with human tutors caused visible irritation and psychological reactance, which was not apparent when pupils worked with their computer system.

Written interactions (prompts) are presented to pupils before, during and after they write. HARRY guides the structure of the narrative, encouraging children to remember to include relevant material whilst providing assistance in the choice of appropriate vocabulary and sentence construction, so that the resultant text conforms to the genre of narrative writing. HARRY enables young writers to make their texts evolve by guiding their revision and editing. The intention is that children improve upon their usual linear rambling approach (the *'what next*?' strategy, outlined later in the paper) by experiencing the idiosyncratic creative process of mature writers.

HARRY is based upon models of the writing process for both mature and beginner writers and models for teaching. The system is simultaneously a cognitive tool designed to engage pupils in higher cognitive operations and a tutor designed to impart expert knowledge. Children's narrative writing performance is improved through a system of prompting which provides a Vygotskian-like scaffolding (Vygotsky, 1962) of the process of mature writers. In addition, cognitive conflict is deliberately induced. Strategies designed to lead to more effective writing are not imposed, but are negotiated and exchanged with young writers; a process which challenges them to both think like mature writers and employ literary techniques essential for the creation of effective narrative writing.

2. Writing models

2.1 The writing process for mature writers

Cognitive psychologists such as Flower and Hayes (1981) have broken the writing processes of mature writers into component sub-processes. It is assumed that writers have limited

capacity for attention, so trade-offs have to occur in the way in which they allocate attention to these sub-processes. Thus, the more attention writers have to pay to memory, the less they have available for translating thoughts into words or for thinking about punctuation etc. Flower and Hayes describe their model as a cognitive process model which they contrast with a stage model. A stage model implies that writing can be broken into discrete linear stages such as planning, writing and revising, with planning occurring before writing and writing occurring before revision. By contrast, their cognitive model takes the view that the processes involved in writing are *recursive* and that the observable stages of writing (brainstorming, planning, composing, reviewing and revising) take place throughout the process. One plans, sets off writing, reconsiders the plan, writes more, revises the first section, plans further steps, writes again etc. For mature writers, writing is an idiosyncratic process of continual revision - ideas emerge and evolve, and meanings are clarified in successive drafts.

2.2 The writing process for beginner writers

Bereiter and Scardamalia (1987) made the distinction between the *knowledge-transforming* composing approach adopted by mature writers and the *knowledge-telling* approach adopted by children which they refer to as the '*what next*?' strategy. Children usually start a story writing episode by composing a short segment that captures their first idea in writing and then reply to the question '*what next*?' with another event. The child does not consciously form the 'what next?' question in the mind, but continues as if it had been asked. A text is arranged around a series of written events, co-ordinated by adjacency or by simple connectives. Therefore, the child writes down an initial idea, then uses this as a cue to probe the memory for associated ideas, keeping going until the ideas stop flowing. However, creating and transcribing a chain of associations leaves no space for reflection - the process characteristic of mature writers. Children are unable to reflect as reflection requires temporarily abandoning current ideas, returning to them later by either remembering the previous context or by rereading the text, which they find difficult.

The 'what next?' strategy results in several problems. Children 'ramble on' when writing (Alexander and Currie, 1998) unable to think beyond the present sentence. Consequently, they write without visualising an overall 'plan' and stop writing when they run out of ideas. The approach is responsible for the ways children usually develop their narratives - categorised by Kroll and Anson (1984) as 'associational' (where the writing is about a series of incidental events with no real coherence); 'descriptional' (where the writing is a catalogue

of details with no development); ‘unanchored action’ (a sequence of events with no setting or context); ‘entanglements’ (where the events become over involved and no resolution is possible) and ‘abandonment’ (where the writing just ends). Furthermore, children rarely initiate revisions to their writing. At best, children proof read at a superficial level, restricting their revisions to the correction of a few spelling or punctuation errors, or the addition of a few lines of text at the end of a story (Baskerville, 1986). Beginner writers seldom make more global changes, such as starting again, adding or deleting words, sentences or ideas in order to clarify the meaning (Shaughnessy, 1977). Thus, for beginner writers, writing is a one-step linear process.

Bereiter and Scardamalia (1982, 1983, 1986) have identified the main cause of the linear 'what next?' approach adopted by children - lack of a response from a conversational partner during the process of writing. When they compose alone, children ‘dry up’ and run out of things to write about due to an inability to recall ideas they in fact already have. Children also tend to assume that the audience shares their background to the events. Therefore, they often fail to produce all the information required to convey the intended meaning clearly. Prompting from a response partner helps children retrieve relevant information. An example or a suggestion initiates a chain of alternative ideas to pursue. A few appropriate words and phrases are often sufficient to stimulate children's memory searches.

Children will improve their writing only in response to feedback, which may be provided either by teachers or peers (e.g. Hillocks, 1982, Trushell, 1986). Bereiter and Scardamalia (1987) base their explanation for children's lack of revision in the absence of feedback, on Piagetian (1926) theories of cognitive development. Revision problems are seen to stem from an inability to represent an event from two points of view - their own and that of the reader, suggesting that children will only learn to maintain two points of view and make *decentred* comparisons between them, when their *egocentrism* eventually diminishes. Bartlett (1982) suggests an alternative view - that revision involves two key processes: *detecting* (including *identifying)* the problem, followed by the ability to *correct* it successfully. For mature writers, *detection* and *correction* are performed simultaneously, but for young writers, difficulties can arise in either of the processes - a failure to detect the problem, and/or failure to make an appropriate correction.

The inability to look beyond the present sentence and visualise the overall shape of a complete text appears to be a more difficult problem to overcome. When young children attempt to record plans in advance of writing, the notes they produce effectively amount to a first draft (Burtis et al., 1983). After experimenting with several strategies, Bereiter and Scardamalia (1986, p.790) concluded that interventions that have a significant effect on planning 'remain to be demonstrated'. Wray and Lewis (1995) suggest the most profitable approach for assisting young children with planning, is to provide 'writing frames' - skeleton frameworks of texts which ensure that children remember to include all the essential features relevant to specific genres.

The speed with which children develop more mature thinking strategies depends partly upon maturation, but also on classroom climate and the kind of support they receive from teachers (White, 2000). Progress may not be steady (Harpin, 1976) and may not necessarily result in improvements in writing quality (Langer, 1969). Increased ability to plan and reflect may even produce writing of a lower quality (Karmiloff-Smith, 1992) as the child may apply poorly understood theories or the process of reflection may disrupt the flow of ideas.

3. Teaching models

Current teaching practices are derived from two models: the *process* model and the *guided* approach. With the process model (Graves 1983, Murray, 1984, Calkins 1986), children receive support whilst they write, from a teacher who moves around the class conducting frequent short conferences individually with each pupil in turn. Each conference focuses on a single aspect, such as supplying a character description. The teacher follows the lead of the child, r*eceiving* the child's own choice of words, before encouraging the child to reflect upon the clarity of the text. New ideas resulting from the conferences are recorded in successive drafts. By encouraging and responding to the child with comments like, *'Tell me where you have got to so far with your story about a dog…does the dog bark loudly like that at all the neighbours? What are you planning to write about next?'*, conferences help children discover what they want to say. Process modellers stress that conferences should avoid negative comments and explicitly telling the child what to do. Instead, children are engaged in *cognitive conflict,* a process which challenges them to think of their own ways to improve their texts. Through extended experience of this process, it is suggested that children find their *voice* and a sense of *control* and *ownership* over what they produce.

However, the approach is difficult to implement effectively. Bereiter and Scardamalia (1986) doubted whether many teachers had developed enough insight into the processes of good writing to help children in the way outlined by the process modellers. Hood (1995, p49) suggested that many of the conferences he witnessed in schools were a 'waste of time' as they merely focused on surface features such as spelling. Furthermore, whilst the process model prompts ideas for incorporation into pieces of writing, it does not ensure that pupils develop their ideas nor does it provide assistance in identifying the elements of specific genres such as story writing. Bereiter and Scardamalia's research revealed the potential value of teachers modelling writing and channelling children's suggestions. *Guided* writing offers greater opportunities for young writers to make valuable connections between text, sentence and word level decisions and can help children shape and redraft texts with particular criteria in mind. So, '*Can you tell me more about the dog in your story? Think of other words that you could use which mean fierce. Perhaps use a simile to describe what he looks or sounds like when he's growling at the neighbours …may be the fact that he growls at strangers could prove useful later in your story?'*

The concept of developing children's writing by making available the assistance of a response partner in a conference situation, has a counterpart in the work of Vygotsky (1962), whose theory is that learning first occurs in a social setting and is then internalised. The emphasis on conferencing is supported by Vygotsky's notion of the zone of proximal development (ZPD), which refers to the difference between what people achieve by themselves and what they can achieve with the assistance from a more skilled person. The assistance is represented by the concept of scaffolding, developed further by Bruner (1986). Scaffolding provides an intellectual framework, a facilitating context, which allows a task to be completed. Then, the scaffolding is gradually removed and the learner learns to cope on his/her own. In the *process* and *guided* approaches, the questions and comments provide the scaffolding for the writer's ideas to be further developed and clarified. The writer should then be better able to develop and clarify a text without so much support.

4. Alternative software, web sites and academic systems

A few examples of commercial software packages, web-sites and academic systems are discussed in this section to indicate the variety of approaches adopted by alternative writing tools. A considerable range of commercial software designed to help children with writing, is currently available for use in schools (www.r-e-m.co.uk). Commercial software tends to focus

on a single aspect such as spelling, structure or motivation. The drill and practice programs (for example, 'Hooray for Spelling', Lander Software) use exciting graphics to create fun arcade style games which teach grammar skills as decontextualised exercises. Sentence building programs (for example, 'Clicker 4', Crick) are targeted at pupils in the very early stages of learning to write. Packages which intend to motivate children through the provision of pictures (for example, 'Story Book Weaver Deluxe', Europress) are similarly most useful with beginner writers, but are also beneficial for disaffected pupils, who need extra motivation to get started. Although word processing packages (such as 'Textease Primary', Softease), can make redrafting technically easier, no guidance for what should be revised is offered and no assistance is given with subject matter. Organisational tools (for example, 'Draft Builder', Don Johnston Software) aim to help pupils plan their stories effectively, but again no assistance is given with story content or making improvements. Applications supplying feedback, such as 'Writer's Helper for Windows', provide quantitative analyses of grammar features. These are geared towards older students who are more able to interpret the statistics and revise their texts as a consequence.

Many story writing sites exist on the web. They tend either to provide 'top tips' (for example, www.blackdog.net), pre-writing ideas such as a title, an opening paragraph or randomly generated suggestions for items which could be included in a story (for example, www.englishonline.co.uk/writers) or simply provide places to 'publish' stories (for example, www.edbydesign.com/storyteller). The sites focus on the end product rather than the process. They assume that children will be motivated and inspired to improve their writing by reading the available advice etc. prior to writing, before submitting their own stories for publication.

The approaches of three previous prompting programs, focusing on issues pertinent to this study, are outlined here. The oldest, ELIZA (Weizenbaum, 1976) demonstrated how it was possible to create the illusion of a conversation with a computer. ELIZA appeared to understand the user by responding to written responses with stored phrases to specific key words. ELIZA was not developed as a tool to assist with writing.

CATCH (Daiute, 1985) presented prompting questions designed to encourage young writers to revise a text before, during, and after, it had been written. The system was simultaneously concerned with both revising and editing. At any time during or after composing a text, the writer could request a list of CATCH features. Some prompts, based on pattern analyses,

offered help with editing, by identifying words or phrases that could be improved upon. For example, the detection of unnecessary, empty words such as 'sort of' and 'well' resulted in the prompt: 'the highlighted words may not be necessary. Do you want to make changes?' Others were designed to assist with revising the content of a text, e.g. 'Does this paragraph include details that help the reader see, hear, feel or smell what you're talking about?' The decision for making any changes was therefore left to the writer. Daiute reported that the system was largely unsuccessful. The revising prompts over estimated the capabilities of young children: insufficient help was given by prompts such as 'How can I make my characters seem more real?' The editing prompts failed to highlight features, which when corrected, would lead to real improvements. Already proficient writers who used the system had better revising strategies of their own.

The Writing Partner (Zellermayer et al., 1991) aimed to assist young writers to shift towards writing in the *knowledge transforming* mode. The system guided adolescent writers through a forced process of planning which involved brainstorming, then used key words selected from the ideas generated to create a story outline. The system assisted the writers as they composed their texts by presenting questions dependent upon the key words identified earlier. In addition, plot ideas and suggestions for words and sentence constructions were made available. The tool did not aim to teach writing techniques or correct errors.

Although ELIZA was capable of holding a 'turn taking' conversation, based on key words typed by the user, the system did not demonstrate how to achieve a conversation which requires structure as is necessary for a tutorial concerning narrative writing. CATCH went some way towards shifting children towards the knowledge transforming approach, but the system with its emphasis on a combination of the processes of revision and editing offered little support for composition, such as demonstrating specific literary techniques, assistance with planning or brainstorming ideas. Furthermore, the linguistic features selected for editing were insufficient to result in improved writing. The Writing Partner, although successful with its targeted age range of adolescent writers, did not offer the kind of support pertinent to young children. An approach requiring the user to plan first, then write a story, is unlikely to be effective with young children, as they are constrained by the *'what next*?' strategy, unable to visualise beyond the present sentence. Moreover, the system relied on the writer already possessing knowledge of narrative techniques and how to make improvements, and the ability to detect and correct grammar errors successfully. It is clear that young children will benefit

most from a computer tool which guides the structure of the narrative whilst facilitating the process of revision. In addition, it needs to explain literary techniques and provide assistance with detecting and correcting significant grammar errors.

5. The HARRY writing system

5.1 The model underpinning HARRY

The model of the writing process underpinning HARRY is presented in Figure 1.

Figure 1

The HARRY writing system was designed to enable children to make a smooth transition from their usual knowledge telling *'what next?*' approach towards the knowledge transforming strategy of mature writers. It is achieved by supporting children as they experience first-hand, the struggles integral to the mature writing process, whilst allowing children to continue using the approach they are familiar with. Constant movements are facilitated between the sub-processes of brainstorming, planning, composing, reviewing and revising, mirroring the idiosyncratic nature of the human mind. By alternating the different aspects of the process, HARRY reduces short-term memory overload giving children time to reflect. The model underpinning HARRY is the same as the model adopted by mature writers - with one exception. Editing, the process of improving grammar and correcting spelling, occurs after composition. Research such as Smith's (1982) has shown that children need to concentrate in the first instance upon the content and coherence of their texts as preoccupation with superficial errors can interrupt and stifle the flow of ideas. Editing for these linguistic features is therefore delayed until the completion of the text.

The mature writing process is referred to by Flower and Hayes (1981) and the process modellers (e.g. Graves, 1983) as *recursive*: writers engaged in a process of, for example; brainstorming, composing, brainstorming, reviewing, composing, brainstorming, revising etc. This implies that there is a regular pattern to the order. A more accurate label for the random nature of thought processes which takes place inside the head would seem to be *idiosyncratic* - peculiar to the individual. This is the definition adopted for the model of writing underlying HARRY. For mature writers much of the process is unconscious - they intuitively know how to write without necessarily knowing how they do it. The task for teachers in general, and the new computer system in particular, is to bring the various writing processes to the attention of children and help children combine them, thus producing an effective piece of writing. Like a human teacher, HARRY achieves this by combining a scaffolding of the revision process

characteristic of mature writers with knowledge concerning literary techniques. HARRY delivers conversational prompts imparting expert-like knowledge specific to the genre of narrative writing in a conference situation when requested by children, before, during and after composition, combining the sub-processes of brainstorming, planning, composing and revising with transcribing. Separate editing feedback is provided, once the draft is completed.

5.2 System overview

The aim is to display a conference situation, where in the absence of a human tutor, children receive written assistance from a computer tutor before, during and after writing. At present, HARRY provides assistance with four story themes: pirates, space, a woodland adventure and an enchanted journey. HARRY organises each story writing exercise into three stages. During stage one HARRY provides assistance with composition and revision. Then, during stage two, HARRY provides editing suggestions concerning grammar and style weaknesses detected in the text. Finally, the child corrects spelling and technical errors during stage three, using the spell-checker available with Microsoft Word.

The composition of the story (stage one) is divided into several sections. Each section is displayed on a separate screen. The child writes a section of the story at a time in response to HARRY's written suggestions. Whilst writing, the child brainstorms, reviews and revises plot ideas, vocabulary choice and sentence constructions in response to suggestions presented in pop-up boxes. The boxes are presented one at a time, but can be revisited any number of times and in any order. Once the child has 'finished' a section, s/he moves to the next by clicking on the *'what next?'* button. Movements backwards and forwards between the sections are facilitated. The child can revisit earlier sections by clicking on the red back arrow at the bottom of each screen until the desired screen is in view, and return to the current screen by clicking on the red forward arrows, but it is necessary to click on the *'what next?'* button to move onto a new section. Clicking on the *'what next?'* button saves the writing in the current section before presenting the new section to be worked on. At any stage the child can temporarily stop writing with the *'that's it for now'* button. The writer is returned to the exact place the writing was stopped when s/he next comes to write. The screen designs for stage one are presented in Figures 2 and 3.

Figures 2 and 3

After the last composing section has been completed, clicking on the *'what next?'* button, takes the child into the second stage (editing). The background screen colour changes from

blue to green to highlight the transition. The first section of text recorded during the composition stage is presented again. The child proof reads the section of text in response to HARRY's editing suggestions, then clicks on the *'what next?'* button to proof read the next section. Moving backwards to a previous section that has already been edited is not facilitated. The child proof reads each section of writing, using the *'what next?'* button to move on to each of the sections in turn, in the order they were written. The screen design for the editing stage is presented in Figure 4.

Figure 4

After proof reading the final section, the child clicks once more on the *'what next?'* button. The whole story (without the prompts) then appears as a Microsoft Word document. Each section is presented as a separate paragraph. The child is expected to make use of the facilities available with Microsoft Word to correct spelling and technical errors and save the story before printing out.

5.3 Implementation

HARRY is implemented on a Windows NT web server, using ASP scripts to communicate with a series of Microsoft Access databases. All interaction with HARRY is via a standard web browser and is therefore platform independent. Several JavaScripts are embedded within the HTML files downloaded to the client's web browser. These are used to open and close additional dialogue boxes. A cookie is written to the client's computer, after the story theme has been selected, which contains the story strategy that will be followed and this is used to store where the child is during the story should s/he, decide to leave finishing the writing for another occasion. When the child returns to continue a story, the cookie is checked; this provides a track of where within the strategy the child is, and authentication of the child, but it requires that the child uses the same computer to write his/her story. The child's story is stored within an Access database on the web server. Separate databases are used for HARRY's first (composing) stage and the second (editing) stage. Thus, it was possible to separately store all the delivered composing prompts with the responses made during stage one, and all the delivered editing prompts with the responses made during stage two. The final version, in which spellings have been corrected, is saved as a Microsoft Word document.

5.4 The interface

At the start, there are two ‘boxes’ on the screen: one containing a prompt from HARRY, the other empty, waiting for a written response from the child. The child is first welcomed by

HARRY and then given the opportunity to *brainstorm* and record initial ideas on a specific story theme selected by the child. Clicking on the *'what next*?' button takes the child to the next screen where a suggestion about how to start the story is made. When the child has exhausted his/her ideas for the opening, s/he clicks on the *'what next*?' button again to move on to the next section of the story. Each time the '*what next?'* button is clicked on, a new screen appears with a *guiding prompt* from HARRY explaining the next section of the story and a reply box for the child to record a response. The *guiding prompt* is permanently displayed for the duration of the time spent on the section.

Three *help* prompts - *help with ideas, sentence help* and *word help* are available to the child in addition to each *guiding prompt*. These subsidiary prompts are displayed separately in pop-up boxes when requested by the child - the child is expected to alternate between the different boxes. A fourth *check* prompt reminds the child of the focus of the *guiding* prompt. Prompts accessed by these buttons supply suggestions designed to encourage children to review and revise their texts before, during and after they write. The help boxes can be viewed in any order and revisited any number of times. In addition, the child is able to move backwards and forwards between the current and previous sections using arrow keys, either to reread a previous section or to make changes to the text written earlier. Previous *help* boxes can also be revisited.

After the *last* section has been completed, the *'what next?*' button takes the writer to the editing section, the stage when HARRY identifies places where a text can be improved grammatically. The original *guiding prompt* and the child's response is displayed for each section in turn. Suggestions for editing are listed in a third box in the same position as the help boxes for the composing screen, although the editing suggestions occur as a list in a single box, rather than separate boxes. Children are required to proof read their own text, locating errors and making changes in response to the suggestions. When the child has finished proof reading the entire story, section by section, the *'what next*?' button transfers the story into Microsoft Word, where the child corrects his/her own spelling errors using the spell checker before printing out the final polished draft.

Children are thus systematically led through the composing process of mature writers, yet also develop their narrative using the *'what next'* approach. Conversational prompts presented before, during and after they write, encourage them to continually revise their writing. The

prompts challenge children to consider alternative ideas and rethink sentence constructions and vocabulary in order to convey their intended message more accurately. HARRY thus expects to change the way children approach the task of writing. Children are guided through the process of juggling the many decisions necessary when writing a story - from what word to use next and how to phrase the next sentence, to developing the overall plot.

5.4.1 The composing prompts (stage one)

Several hundred conversational style prompts designed to encourage children to include specific narrative writing techniques are stored in Microsoft Access databases. The g*uiding* prompts, each supported by the three *help* suggestions and the *check* prompt (created as additional fields in the database) are grouped in the following sections: *welcome, start, setting, character, action, complication, key word* and *last.* Each category contains 4-15 *guiding* prompts plus the subsidiary *help* and *check* prompts. (Appendix 1 contains examples of the prompts available for a story which has an enchanted journey as a theme).

A *strategy* table enables the required sections to be listed in a predetermined order, ensuring that all the elements essential for a story are included. As a child proceeds from one section to the next, one *guiding* prompt is selected at random from within each section listed in the strategy. Prompts are programmed not to be repeated within one story. It is possible to vary the frameworks for different story themes because the strategy is flexible. For example for the space story the sections are ordered: *Start, Setting, Key, Character, Action, Key, Complication, Last,* whereas the journey story theme has the order: *Start, Character, Setting, Action, Key, Complication, Action, Key, Last.* The ability to vary the order ensures a logical progression is achieved for each story, based on knowledge of the content of the prompts. The benefit of programming randomly selected prompts from within each category is that different suggestions are presented to each child, as they would be with a human tutor. Ordering the sections within the *strategy* table ensures the resultant story is logically structured into paragraphs, each containing a theme and that all elements of a story (an opening, setting and character descriptions, a series of events including a complication, a resolution and ending) are included.

The purposes of the sections within the strategy are:

Welcome: To introduce the story theme and initiate thinking about the topic. Example prompt: *I'm sure you will enjoy writing a pirate story. Make a list of useful words in the box below.*

Start: To suggest one of three main ways of opening a story (action, dialogue, description), thereby creating an interesting start to the story. Example prompt: *Try starting your story with one of the astronauts talking.*

Setting: To evoke the atmosphere and create the background to a story by providing a detailed description of the setting. Example prompt: *Describe what it is like in space. Make me feel as if I am really there. Think about what you can see looking far out into space.*

Character: To consider the personality of the main characters and how it is shown in their speech and actions etc. Example prompt: *Think about what the travellers in your story are like. Try to show this in the things that they do and say.*

Action: To supply details of the main events. Example prompt: *The pirates could do a spot of fishing and find something else instead!*

Complication: To provide an unexpected turn in events, a twist in the tale or a problem to be solved. Example prompt: *The weather could change. This could cause problems.*

Last: To state what happens as a result of the events including the complication. Example prompt: *You'd better start bringing your story to an end. You may need to sort a few things out first.*

Key: To encourage children to expand upon ideas they have already chosen to write about, for example: *Tell me more about the rocket*. *Key* prompts are based upon words used by a child in a preceding section. These *Key* word prompts suggest supplying more descriptive setting or character details, or additional events, including complicating actions. A synonym table containing key words of similar meaning, including common spelling mistakes made by children (for example: spacecraft, spaceship, roket and rocket) increases the chance of a writer writing a particular word that supports a *key word* prompt. The *key* word prompts, by following the lead of the child, prevent the system from becoming merely an electronic

worksheet with a completely predetermined framework, although with random prompts. The *key* words (such as rocket, magician, dragon, alien, wolves, town, mountain etc.) are suggested within other prompts to increase the chance of *key* words appearing in a text, although it is anticipated that children will incorporate *key* words without following the specific suggestions. *Key* word prompts are targeted in the strategy to occur after the section suggesting the key word.

Linked to each guiding prompt are four additional help categories:
Ideas help suggests details or events that could be included when responding to the *guiding prompt,* to help inform and entertain the reader. So, for a space story, the *guiding prompt* might suggest that the child writes a description of outer space. The child can request an idea for how to do this and receive the prompt: *Think about the darkness, the bright lights, the silence, the stillness and the weightlessness.*

Sentence help suggestions encourage children to vary sentence length and style. For example: *Try asking a question next, or two or three questions in a row, like this: "What was that? Did you see it?* Alternatively, it might be suggested that the writer uses dialogue, similes and metaphors, or to start sentences in different ways, such as with a verb and to use a variety of connectives, choosing from examples provided, thus encouraging children towards writing complex sentences and to interweave dialogue with descriptions etc.

Word help encourages the careful selection of appropriate and sophisticated vocabulary. A list of alternative words relevant to the theme of each paragraph is provided. For example, word help for a paragraph suggesting a description of space might include the words: stars *blazing, burned brightly, dazzling, flashing, flickered, glinted, glistening, sparkling, twinkling, pitch black, unending darkness, like soft velvet.* Techniques such as grouping words alliteratively are encouraged.

The *check* prompt reminds the writer to ensure that the message of each section is clear and interesting for the reader. For example, when the *guiding prompt* suggests writing a setting description, HARRY might ask: *Have you used at least three adjectives to describe the scene? How about a simile?*

HARRY thus encourages children to review and revise a text before, during and after transcription occurs - the composing questions are simultaneously revising questions. Many new 'drafts' are made during the composing process. Within each section, it is anticipated that vocabulary will be reviewed, sentences will be reworked, new ideas will be incorporated and plans will be amended.

5.4.2 The editing prompts (stage two)

When the child has completed the composing stage, working through each section in turn in response to HARRY's prompts, clicking on the *'what next?'* button takes the child to the editing stage. The editing process is separated into two aspects: grammar (including style) and spelling. First, HARRY provides feedback concerning grammar and style weaknesses, then after the final section, the *'what next?'* button transfers the whole story (without the prompts) into Microsoft Word, where the child can correct technical errors and spellings with the aid of the spell-checker.

When editing a story, the child is expected to look at each section of the story in turn, in the order that the sections were written in. HARRY identifies places where the text can be improved grammatically and stylistically, and suggests ways of making improvements. It is expected that the child will proof read and make appropriate amendments to the text in the light of the advice. Three aspects of writing are commented upon at the editing stage: punctuation, vocabulary and sentence construction. Suggestions drawn from these categories are then listed, in order to help children identify specific places where improvements can be made and how these could be effectively achieved. The children are expected to respond to each prompt on the list in turn. As with the composing stage, the editing prompts are conversational in style.

Punctuation

<u>Marking the end of sentences</u>

HARRY indicates places in each section where full stops may have been omitted.

1. If more than 30 words are detected without a full stop, then the child is prompted to *'Check the long sentence beginning […]. It may need breaking up into smaller sentences'*. The child is expected to locate the 'long sentence', then find places where full stops could be correctly positioned. If a full stop, exclamation or question mark is missing at the end

of the section, the prompt *'You have forgotten the full stop at the end of this paragraph'* will be delivered.

2. Questions demarcated with full stops rather than question marks are identified. Sentences beginning with question words such as: *Who, Where, What* etc. which end with a full stop are detected, resulting in the prompt: *'Do you need a question mark at the end of the question beginning [Where]?*
3. Minor sentences (one or two words) punctuated with full stops are highlighted, so that they can be replaced with exclamation marks, for example: *'The word [Hello] needs an exclamation mark after it!'*

Marking clause boundaries

HARRY highlights places where commas might be used within sentences to separate clauses.

1. The co-ordinating connectives *but, so, yet* and *then* used within sentences (indicating compound sentences requiring a comma before the connective) are detected. For example, HARRY suggests *'You may need a comma before the word [but]'*.
2. Sentences that begin with a single-word adverb (ending *ly*) such as 'Suddenly', which require a comma after the adverb are detected. HARRY also checks for other individual adverbs like: *Also, Later, Next, First* and *Last*; interjections like: *Yes, No, Yeah, Well, Ah* and *Oh*; and connectives like: *Yet, Also* and *So,* used at the start of a sentence. If an adverb, an interjection or a connective is detected without a comma present at the start of a sentence, HARRY suggests *'You may need a comma after the word [Luckily]'* etc.
3. HARRY detects long complex sentences where commas may have been omitted, by highlighting places where between 12 and 30 words are written without the presence of a comma, full stop, brackets or comma like words (and, because, or, that). HARRY then suggests *'Check the sentence beginning […]. It may need commas.* It is anticipated that having been alerted to the error, the child will find appropriate places to position commas.

Vocabulary

HARRY checks for simple and frequently repeated words:

1. The simple words (*One day, nice, big, said, went, walked, got, get, saw, ran, going, thing*) are detected. Alternative more sophisticated synonyms are offered, or the suggestion is made for the writer to think of an alternative for his/herself. For instance, HARRY suggests *'You have used the word [nice]. You could use a better word like [beautiful,*

delicious, enjoyable, interesting or exciting]', or 'You have used the word [get]. Try a better word or words'.

2. If the basic connectives *also, so, then, but, because* are repeatedly used in the whole text (more than a threshold of 0.8% of total words, a figure which was determined empirically) HARRY suggests: *'You use the word [so] a lot in your writing. Do you really need it?' etc.*
3. If key words related to the story theme (*journey, pirates, wood, space*) are frequently repeated (more than a threshold of 0.8% of total words, a figure which was determined empirically) HARRY suggests for example: *'You use the word [pirates] a lot in your writing. Try another word, or words, like shipmates, gang, bloodthirsty crew, dastardly bunch'.*

Sentence construction

1. HARRY detects where the basic connectives *and, but, because, then* and *so* have been used twice or more in a sentence, suggesting: *'Try not to use the word [and] more than once in a sentence. You could replace one [and] with a comma, or a full stop followed by another word that fits'.*
2. Sentences that start with the same word three or more times in one section, are detected and then commented upon: *'You have used the word […] to start three or more sentences. Can you think of a different way to start these sentences?'*
3. HARRY detects a sequence of three or more simple sentences (where each sentence is between 8 and 12 words long), commenting: *'You have several short sentences in a row. For a better effect, link two of them together with a word like: if, with, when, how, except, while, although'.*
4. HARRY detects a sequence of three or more consecutive long sentences (between 14 and 20 words) and comments: *'You have several long sentences in a row. Try breaking one of them into shorter sentences to vary them'.*

To avoid unnecessary repetition of the editing prompts, if a child writes more than one sentence in a section containing several 'and's, uses the same words requiring a comma or a specific simple word which would be improved by substituting an alternative synonym several times etc, the prompts in these cases are presented only once. Although the prompts have been presented in this section according to the category they relate to, in practice, the prompts are programmed to be delivered in the order of first prompts requiring the child to

identify long sections of text, then prompts requiring the child to scan the text in the search for individual words, as the latter was thought to be less tiring to do than the former. The following list of prompts indicates the order, number and variety of prompts presented to help a child edit one section of text, although the number and variety of prompts varies according to the length of the text and kind of weaknesses evident within it. (The complete range of editing prompts is presented in Appendix 2).

- Check the long sentence that begins ["First we'll show]. It may need breaking into shorter sentences with full stops.
- Try not to use the word [and] more than once in a sentence. You could replace one [and] with a comma, or a full stop followed by another word which fits.
- Do you need a question mark at the end of the question beginning [How]?
- You may need a comma after the word [Yes].
- You have used the word [said], try a better word like: suggested, whispered, joked, promised, interrupted, muttered or yelled.

6. Evaluation of the system

Three case studies are presented to indicate the effects of the HARRY writing system upon children's writing performance and behaviour. The children involved in the study were randomly selected from a mixed ability class of 8/9-year-olds, attending a co-educational, state-funded primary school. Each child wrote two stories on the same theme: a control story (written with a cut-down version of the system presenting a prompt suggesting a story theme and an accompanying reply box, but no further assistance) and a story written with the full assistance of HARRY. The effects of the system upon the children's writing performance and behaviour are analysed through a detailed comparison of the stories they produced and observations made of the children as they were writing. The findings of a control group of children from the same class, who just used the cut-down version of HARRY to write two stories on the same theme, are also presented.

The data was collected over five weeks. Each child was permitted by the school to use HARRY for two literacy lessons a week, but they were allowed as many lessons as they needed to complete each story. The functions of the full HARRY system were demonstrated to the children before they started writing their assisted story. They were instructed to always

consult all of the help buttons when embarking on a new section, leaving open the help option they considered most useful. It was explained that they could, and should, consult the other help boxes again, whenever they wished.

The control and HARRY assisted stories are compared along two dimensions: organisation (including literary techniques) and grammar (including style). Descriptive qualitative assessments are made of the following organisational features: story structure including paragraphing, the tone of the story, the story opening, the presence of a problem or twist in the tale, characterisation, setting descriptions, use of dialogue, literary devices such as alliteration, patterning and similes, and the story ending.

A specially designed computer utility tool - CHECK TEXT - is used to provide statistical data concerning grammar and style features. A previous study in which statistical analyses were performed upon a set of sample stories representing the range of ability levels associated with 11 year olds (Holdich, Holdich and Chung, 2002) has demonstrated that CHECK TEXT successfully distinguishes strengths and weaknesses in 12 aspects of children's written grammar and style. CHECK TEXT is used to provide detailed quantitative analyses for the control stories and for each of the three stages of the HARRY assisted stories. CHECK TEXT provides statistical analyses of twelve features covering story length, punctuation (full stops and comma use), sentence construction (use of basic connectives and simple sentence starters) and vocabulary (variety and sophistication). The twelve features are:

1. The total length of the story in words (as a measure of the amount of detail included);
2. The percentage of different words used in the first 100 words (as an indication of the extent of a child's vocabulary resources);
3. The number of '*and*'s used as a percentage of the total words (as an indication of the frequency of very basic compound sentence constructions);
4. The basic connectives *but, so, then, because* used as a percentage of the total words (as an indication of the frequency of basic compound sentence constructions);
5. The percentage of sentences started simply with a pronoun or the definite article (as an indication of the frequency of basic sentence constructions);
6. Average words per sentence (as an indication of the variety of sentence lengths and types);

7. Number of different words with more than 5 characters as a percentage of total words (as an indication of sophisticated vocabulary);
8. Number of adverbs as a percentage of total words (as an indication of sophisticated vocabulary);
9. Common verbs used (*said, went, got, get, was, were*) as a percentage of total number of words (as an indication of simple vocabulary);
10. Total common words (all common verbs and basic connectives identified above) as a percentage of total number of words (as an indication of simple vocabulary);
11. Mean words per sentence (as an indication of the correct use of full stops);
12. Commas used as a percentage of mean sentence length, excluding commas used in lists (as an indication of the presence of clauses within complex sentences demarcated by commas).

As the significance of the statistics calculated for the stories written by the children involved in this study is not obvious without reference to the statistics calculated for the original sample stories (presented in Holdich et al., 2002) three assessment categories were determined - *poor, fair* and *good*. The assessment boundaries are presented in Table 1. The statistics together with the *poor, fair* and *good* reports, form the basis of the grammar and style comparisons for the stories reported in this paper. The statistical data is illustrated by examples of specific words and phrases.

Table 1. CHECK TEXT assessment boundaries

The children were also observed as they performed the writing tasks, in order to gain a fuller understanding of HARRY's effects upon the children's writing behaviour and performance. Field notes were recorded noting how the children approached the writing tasks, and observable reactions they made in response to HARRY's prompts whilst they were writing.

6.1 Control group

Sarah

Sarah wrote both stories without making any changes, apart from spellings. Both of Sarah's stories are written in a similar entertaining style. They feature similar events - emergency messages requesting assistance in outer space are delivered to a computer screen. Both stories

follow a logical beginning-middle-end structure. Paragraphing is used to group ideas together. The stories start in a similar 'matter of fact' way:

First story: *I was in a bike shop, my mum and the person behind the counter were helping my little brother, Johnny choose a bike for his birthday.*
Second story: *Hello, my name is squeaky, I am a robot from Caneyned city on the planet Titon.*

The stories similarly end with a succinct final comment:

Story one: … *Johnny wheeling out his bike with a grin on his face!*
Story two: *Never mind, I might get another chance another day!*

Both stories are written in the first person. Some dialogue is used in the first story, but not the second. Neither story makes use of literary devices such as similes and metaphors, nor provides setting or character descriptions.

The CHECK TEXT scores for both stories are presented in Table 2. The 'good' reports are highlighted.

Table 2. CHECK TEXT scores for Sarah's space stories

CHECK TEXT recorded similar scores for each story for three features: mean sentence length (first story = 11.2 words, second story = 12.1 words) common verbs (first story = 4.7%, second story = 4.4%) and sentence to comma ratio (first story = 0.7, second story = 0.9). The second story achieved better scores for two features: variety of words (first story = 60%, second story = 67%) and simple sentence starters (first story = 52.6%, second story = 40%). Worse scores were recorded for the second story for five features: use of the connective *and* (first story = 1.9%, second story = 3.3%), common connectives (first story = 0.9%, second story = 1.7%), adverbs (first story = 0.9%, second story = 0%), total number of words (first story = 213 words, second story = 181 words) and common words (first story = 7.5%, second story = 9.4%).

There is little difference in quality between the organisation of both stories. Though structured and entertaining, both stories lack detail and literary techniques. CHECK TEXT recorded two less 'good' reports for her second than her first story. The analysis revealed the same stylistic weaknesses in both Sarah's stories - lack of variety of words, lack of adverbs and frequently starting sentences in a similar way. Sarah's strength in both stories is with sentence

construction - she writes using a mixture of complex and compound sentences which she punctuates accurately.

Laura

Laura wrote steadily without rereading her work. Both of Laura's stories are long, containing an organised series of interesting, imaginative and unpredictable (although different) events. The stories progress logically. Ideas are grouped together in paragraphs. Dialogue is interwoven with a description of events. The setting and characters are indicated. Both stories feature some interesting phrases, for example:

First story: *you can count on me not to be nasty, the lift was down in a matter of seconds, the craze cracker was gleaming in the morning sunshine, they exchanged their goodbyes.*
Second story: *a whizzing flying saucer flew past their ears, for once in their life they believed him, yellow stars wound their way around a path.*

Neither story makes use of literary devices such as similes and metaphors to enhance descriptions, although adjectives are used effectively in both, for example:

First story: *Big friendly alien, super trooper kit, a bush that stood very tall.*
Second story: *glistening spiky shape, a strange forest, a rather thin tall man.*

The CHECK TEXT scores for both stories are presented in Table 3. The 'good' reports are highlighted.

Table 3. CHECK TEXT scores for Laura's space stories

CHECK TEXT recorded similar scores for Laura's first and second story for three features: simple sentence starters (first story = 32%, second story = 28.1%), average sentence length (first story = 11.9 words, second story = 9.2 words), and common words (first story = 10.1%, second story = 9.9%). The second story scored better for three features: use of the connective *and* (first story = 4%, second story = 2.1%), words > 5 letters (first story = 10.1%, second story = 14.1%), and adverbs (first story = 0.3%, second story = 1.3%). The second story scored worse for four features: total number of words (first story = 593 words, second story = 523 words), variety of words (first story = 68%, second story = 51%), common verbs (first story = 4.6%, second story = 5.7%), and sentence to comma ratio (first story = 4, second story = ∞).

There is little difference in quality between either the organisation or grammar elements of Laura's stories. Both stories are detailed and well structured. CHECK TEXT awarded both stories four 'good' reports. Laura writes short, though punchy sentences, accurately demarcated by full stops, but not commas. Whilst some of her vocabulary is sophisticated and adventurous, the majority of the words she uses are basic.

The story pairs written by the control group of children were strikingly consistent in quality. Both pairs of stories display similar organisation and used similar literary techniques. The CHECK TEXT scores reveal some variation in each story pair between certain individual grammar and style elements, but overall, there is little difference between the pairs of stories. Although the sample size of the control group is small, it suggests that children are unlikely to improve at story writing without receiving assistance. This is consistent with the research outlined earlier, such as Graves (1983) and Bereiter and Scardamalia (1987).

6.2 The study group

Sophie

Sophie chose the woodland story theme. Both the control and the HARRY assisted stories are written in the style of a diary, but feature very different events. Sophie's control story demonstrates her particular strengths: she presents a series of events including a twist in the tale: four children go to stay in a cottage with their mother - except the 'mother' is a witch disguised as their mother. The children are suspicious and discover her true identity by overhearing a phone conversation. They destroy the witch with a bucket of water. The story ends with the children safely back at home. Sophie attempts to build up suspense, uses simple adjectives to provide setting details, and indicates character's personalities, as this excerpt shows:

'She has pointed toes and holds her nose when we are around … I never trusted her I told them to be careful and not to trust anyone essppeslie (especially) *her and those dogs'*.

The story has several weaknesses: it lacks an effective opening, the events of the story are not fully developed, nor presented in paragraphs, descriptions are composed of simple adjectives and not enhanced by techniques such as grouping adjectives into phrases or using similes (e.g. *'there's cobweb's hanging from the ceiling … there's hard beds'*), and the ending is rushed. There is little dialogue.

The HARRY assisted story follows a clear plan including a double 'twist' (first wolves start to attack, then a cave man appears). The ideas are fully developed in paragraphs. The story starts with the main characters introducing themselves directly to the reader and explaining that they are about to go to a holiday house. Characterisation is made clear, for example: Daniel is *'bossy and naughty ... he always wears his baseball cap backwards ... and a jumper tied round his waist'*. Sophie uses original similes and a metaphor, for example *'we're as excited as a birthday party'*, and '*in their* (the wolves) *eyes there was a sharp bit of fire'*. Adjectives are grouped together for effect using alliteration, for example *'dark, damp, dank and dreary'*. Suspense is deliberately created - two incidents are built up - the entry of the wolves, and subsequently, the appearance of a strange creature. Pacing is achieved by varying sentence constructions - long descriptive sentences are interspersed with short simple and minor sentences, and by ending a paragraph on a cliff hanger, for example:

'Something moved behind me … The wolves seemed to appear from THIN AIR, from behind every tree their eyes glinting there was a rush of wind and the glinting vanished … They pounced! Then gave chase but …'

There is a detailed resolution: a cave man frightens the wolves away, then shows the children his home. This section contains much dialogue, although speech marks are not used. The ending brings the story round 'full circle': the children's parents have decided to buy the holiday home and the children are pleased that they can continue to see their new friend.

Some weaknesses are apparent with the HARRY assisted story: the story starts in an uninteresting way and ends rather abruptly, and Sophie's attempts at using adventurous phrases are not always successful, for example,

'I called down the hole Daniel it flooded down and out in a few short seconds, it filled the forest with life cries of birds the rustling of the wind'.

Nevertheless, the organisation of the HARRY assisted story is better than the control. The ideas contained in the control story are difficult to follow; the HARRY assisted story is an exciting adventure, which is mostly well paced and clearly explained.

The CHECK TEXT scores for both stories (including each stage) are presented in Table 4. The 'good' reports for the control story and final stage of the HARRY assisted story are highlighted.

Table 4. CHECK TEXT scores and reports for Sophie's stories

The scores for Sophie's control story reveal a strength in vocabulary - both variety and sophistication - (variety = 76%, words > 5 letters = 16%, adverbs = 0.8%, common verbs = 4.3%, common words = 8.5%) for example: *'surrounded, decided, insisted, normally, destroyed, trusted'*. Her story shows evidence of the beginnings of mature sentence constructions (simple sentence starters = 18.2%, total basic connectives = 4.3%, of which 2.4% = the connective *and*). The story is reasonably detailed (376 words). CHECK TEXT demonstrates Sophie's weakness is in punctuation (average sentence length = 17.1 words, sentence to comma ratio = 2.8). By inserting full stops and commas correctly in her text, her average sentence length is reduced to 8.2 words and sentence to comma ratio is improved to 0.7. Whilst the presence of commas indicates some complex sentences (e.g. *'Not for me, I was too old')*, the very low number of words per sentence indicates that Sophie writes using mostly simple sentences, although she varies the way she starts them (simple sentence starters = 10.9%).

CHECK TEXT awarded Sophie's HARRY assisted story five more good reports than her control story. The HARRY assisted story is more detailed (663 words). Improvements have been made with vocabulary choice (variety = 78%, words > 5 letters = 18.3%, common verbs = 4.1%, common words = 8.3%, adverbs = 1.8%). Many sophisticated words are used such as *'interrupted, approached, gigantic, hurtled, muttered, whispered, bravely, proudly'*. More, but not all sentences are correctly punctuated (mean sentence length = 16.2, sentence to comma ratio = 1.1). There is evidence of more deliberate control with sentence structure - using simple and minor sentence structures for dramatic effect, for example '*We came to a dead end … He understood us …They pounced'*. Complex sentences containing several clauses are constructed, for example, *'Daniel was so excited that he crouched down and vanished down the hole before you could say stiganopithicus'*. A persistent weakness with punctuation is evident. There are places where full stops (including question marks) and commas have been omitted.

Sophie demonstrated an ability to organise a series of events with the control story. With HARRY's assistance, Sophie organised her ideas into paragraphs, each containing a clear theme. For example, in response to a Key word prompt, Sophie wrote an entire paragraph describing how the wolves appeared. Many instances of cognitive conflict were evident in her

writing. For example, HARRY's guiding action prompt suggested that the children in her story could discover a secret tunnel, a secret door, or a secret staircase in the wood. Sophie responded by writing about a hole in the ground which was home to a pack of wolves. Later, the guiding complication prompt suggested that someone could get injured or lost. The sentence help suggested that she could build up to the event by describing someone glimpsing or hearing something. Sophie responded by building up the entry of a strange creature, who saved the children from being attacked by the wolves:

'a strange creature pocked (poked) his head out of a rather small cave slowly a hand then another hand. A shaggy large round fat head came out. The weird creature…was 10 feet hight (high)'

Similarly, HARRY's suggestion for suitable words to describe the wolves (scary, shaggy, fierce, mean, drooling saliva) caused Sophie to describe the wolves as *'wet drooling zombies'*.

When writing the control story, Sophie demonstrated that she was reflecting about the appearance of her text - she made several changes to the layout and changed some words from lower case into capital letters. When composing the story with HARRY's assistance she made changes to the content of her text - she visibly changed her mind about her choice of words. For example, HARRY suggested that Sophie should describe the wood. Sophie read the word help which listed the words 'eerie, scary and spooky', returned to a previous word help box which suggested the words 'dark, damp, cold and wet', then spent several minutes arranging words into an order she liked, finally producing the phrase *'it's dark, damp, dank and dreary'*. Sophie returned four times to the welcome section to add details to her original plan related to how the story was developing, including: the personality traits of her main characters, discovering wolves in the wood, and how a cave man protects the children.

The first stage, (the composition process) had a noticeably negative effect upon Sophie's punctuation - a weakness already detected within her control story. Her CHECK TEXT score after the first stage for mean sentence length (36.6 words) was twice that of the control story, indicating poorer use of full stops and she used proportionally fewer commas to demarcate clauses than in the control story (sentence to comma ratio = 7.3 compared to 2.8 in the control). Reflecting about plot ideas and vocabulary seemed to have caused her to frequently forget to punctuate her sentences. However, evidence of worse writing is a noted sign of rapid cognitive development (Karmiloff-Smith, 1992). By making editing suggestions at the second stage, HARRY helped Sophie improve her punctuation to a level similar to that

demonstrated in the control story, but did not help her improve her punctuation sufficiently to achieve a 'good' report, as many sentences remained poorly punctuated. Although HARRY alerted Sophie to places where full stops and commas were needed in her story, she did not find all the places requiring them. For instance, she was directed to the following section of text requiring full stops (spelling was uncorrected at this stage):

The weird creature came out of the cave he was 10 feet hight he let out an oooohhhhhhhhhhh imedeatly the wolves fled with feir.

Sophie positioned one full stop correctly after the word cave, and capitalised the first letter of the following word, but she did not notice the other two places where full stops were required.

Rachael

Rachael chose the pirate story theme. The control story indicates that Rachael can write lively, entertaining stories. The story, though short, contains many successful features - paragraphs, an interesting opening explaining the theme of the story (a problem with the crew), an introduction to the characters (all of whom have specific jobs on board ship), and an event (the one female pirate - Betsy - makes the rest of the crew wait upon her), and a satisfying ending. The moral of her story is that the captain is reminded through Betsy's actions that she is a lady. Her action ensures that he remembers to call his crew *'ladies and gents'* and not to refer to them all as *'lads'*.

Rachael demonstrates that she is aware of the humorous, colloquial style pirate stories are usually written in when she writes in the introduction:

'Welcome aboard the spicy island…I shall begin if you don't mind.'

She ends her story in the same happy-go-lucky manner, bringing the story around 'full circle':

'They were the good old days when all I did was order people to do things and lye (lie) *in the sun. Bye from the spicy island.'*

She devises appropriate names for the characters, such as 'Fatso' who is the ship's cook and 'Wolly' (presumably meaning Wally) who is the ship's entertainer. A light-hearted style is used throughout, such as:

'She pulled out a chair and watched the sea splashing at the sides of the ship. She called down to Fatso a strawberry cocktail please.'

Patterning is used for effect:

'There was a rumbling and a tumbling they all knew what it was.'

Although the control story contains a clear beginning, middle and end, with some characterisation and description of the setting, the story lacks detail and events.

The HARRY assisted story is a more effective story than the control. It contains many more features expected of pirate stories - traditional phrases, more humorous character sketches and details of the ship etc. The opening dialogue is chosen carefully to set the scene and the tone of the story. The reader's interest is immediately engaged by the ironical comment:

'"There she is, she's beautiful" the captain sighed. Captain Paul of the good ship GOLDEN GIRL was looking at his rusty dirty ship and calling it beautiful!'

The beginning-middle-end-structure evident in the control story was improved upon in the HARRY assisted story. The story recounts a series of events including a twist in the tale and a resolution, ending with an effective, succinct, final comment:

"Well cheers to our new lives," exclaimed the captain. In a few weeks time they were living in gold.

Typical sayings are incorporated, such as *'Shiver me timbers'*, as well as some with slight variations, such as *'Yo ho ho and a bottle of grog'*. The story contains many of the elements expected of a pirate adventure. There is a crew of rather stupid pirates (though some are *'brainier'* than others), huge waves, desert islands with palm trees, swaying hammocks, sharks, much panic on board ship, and most important of all, *'TREASURE!'*

The story is well structured and fast moving. Paragraphing is used to group ideas together. Dialogue is regularly interspersed between descriptions of the events. Pacing is achieved by building up slowly to key events, such as the events leading up to the pirates falling overboard:

'What they didn't know was that there was a big wave coming. Then the wave came to the sides of the ship. It had to be a very large wave to reach all the way to the top of the ship because it was a very tall ship. Hammocks swayed and knocked the two lazy twins into the sea.'

Details of the setting are mentioned at intervals during the story. The *'very tall'* ship is *'rusty'* and *'dirty'*, with a '*crossbones'* flag. On deck there are *'torn hammocks', and o*ut at sea there

are *'little bits of sand where the palm trees grew tall'*. Characterisation is clear. There are *'lazy pirates'* who spend their time *'lying in torn up hammocks'*. These pirates get what they deserve, for they are washed overboard by a huge wave. This starts an argument between the *'lazy pirates'* and the *'brainy pirates'*. The *'brainy pirates'* blame the fact that the ship '*hit something and disappeared into thin air'* on the lazy behaviour of these pirates, commenting*:*

"It is all your fault you two, if you weren't so lazy you wouldn't have fell over board" argued the working brothers'

Later, when a shark attacks, the '*lazy pirates'* are similarly critical of the '*brainy pirates'* saying with a smirk on their faces:

"Ahhh! You didn't get us out of this one did you"

The pirates' enthusiasm for treasure is made obvious:

'The crew had to speak sometime because what they had seen was what they wanted. Altogether (not knowing that another pirate or pirates were going to say it as well) they screamed, "Lets grab it."

The only weakness with the story organisation of the HARRY assisted story is that some of the characters lack detail such as their names.

The CHECK TEXT scores for both stories (including each stage) are presented in Table 5. The 'good' reports for the control story and final stage of the HARRY assisted story are highlighted.

Table 5. CHECK TEXT scores and reports for Rachael's pirate stories

CHECK TEXT scores for the control story show that most sentences are accurately demarcated with full stops (mean words per sentence = 12.5), but that commas are never used. The low average of words per sentence indicates a predominance of short, simple sentences. The low percentage of the basic connective 'and' (2%) and other common connectives (1.7%) suggests that the writing consists of few compound sentence constructions. A reasonable range of sentence structures is evident (simple sentence starters = 39.3%). Vocabulary is reasonably sophisticated (common words = 7.1%, common verbs = 3.4%, number of words > 5 letters = 14.9%) for example, *reminds, entertainer, harbour, cocktail, sniffing, explained* and varied (variety = 67%).

CHECK TEXT awarded Rachael's HARRY assisted story three more good reports than her control story. CHECK TEXT indicates that improvements have been made with the HARRY assisted story in the variety (72%), although not the sophistication of vocabulary (words > 5 letters = 14.8%, common verbs = 5%, common words = 9.1%, adverbs = 0.9%). Punctuation is improved with clauses in complex sentences demarcated by commas (sentence to comma ratio = 0.8) and different ways of starting sentences are attempted (simple sentence starters = 32.8%).

When writing both the control and the assisted story, Rachael worked fast - without pausing or rereading any part of her story. During the composing (first) stage of the HARRY assisted story, Rachael flicked quickly between the help boxes, closing them all down before writing each section. She typed furiously, like a touch typist. Although Rachael appeared to open and close the boxes too quickly to allow sufficient time for fully reading their contents, the suggestions contained within them seemed to influence the ideas Rachael developed in her story. HARRY's word suggestions (such as sharks, treasure, hammock, bedlam) may have caused her to devise the events described above around them. Furthermore, there were several indications that Rachael was reflecting about the content of her story. For instance, in the welcome section, Rachael recorded details concerning the ship's appearance. She intended to call it the '*scruffy ship'* because it was *'really scruffy', 'dirty and untidy'*, with a *'rusty funnel'*. When Rachael wrote her opening paragraph, she demonstrated how she had considered the ship's appearance from the Captain's point of view - although the ship was shabby, he considered it beautiful! She may have been influenced by one of HARRY's help ideas which asked *'Is it a shabby or neat ship?'* The second guiding prompt suggested that *'one of the pirates could cause an accident by being lazy or clumsy about one of his jobs'*. A suggestion within the supporting ideas prompt was *'perhaps a pirate (who can't swim) falls overboard',* whilst the sentence help suggested using dialogue such as *'It's all your fault…' A* humorous argument between the '*lazy pirates'* and the '*brainy pirates'* (see above) was the central theme of her story, and the argument started when the lazy pirates were knocked out of their hammocks overboard. When writing the final paragraph Rachael commented on how she liked the word '*cheers'* (from one of the sentence help suggestions for how to end the story). She kept the sentence help box open the entire time she was writing the final section, to remind herself to finish the story with the Captain saying 'Cheers!'

It was anticipated that the editing suggestions would cause the children to simply 'tidy up' their writing - refine single words and rethink punctuation because the process of reviewing and revising would have already occurred. HARRY's editing suggestions prompted Rachael to critically re-evaluate her writing. She deleted words, phrases and sentences, and substituted others in three of the sections. Research such as Shaughnessy's (1977) - outlined earlier - has indicated that making these kinds of changes is a rare occurrence for beginner writers. The CHECK TEXT analysis reveals how Rachael wrote an additional 45 words during the second stage. For instance, Rachael started to alter her fifth section (where HARRY had merely suggested finding alternative words for 'saw, going and then'), then decided to rewrite the section completely. This is how the section had been written before editing:

'Know one was actually helping because they were all trying to steer away from the shark. Nobody noticed what was going to happen. They were steering themselves into a sea rock. Then they all saw what happened they drove themselves through the rock'.

After editing, the paragraph was changed to (N.B. new phrases and sentences have been underlined):

'Know one was actually helping because they were all trying to steer away from the shark. Nobody noticed what would be happening to them in a matter of seconds. They were steering themselves into a sea rock. Soon after they all knew what was happening they had driven themselves through the rock. They thought they had escaped from the shark because a door had opened and let them into a secret hiding place really. So it looked like they were safe but the shark would not give up.....'

Similarly, Rachael spent some time rethinking the way she started her sentences in response to HARRY detecting that she had started many of them with the definite article. Giving 'The captain' a name partially helped solve one problem: '*The captain was awakened by cheers of joy'* was altered to *'Captain Paul was awakened by cheers of joy',* but Rachael was not entirely satisfied with her solution. During the process of correcting spellings with the spell checker available with Microsoft Word, the grammar checker offered an alternative solution: '*Cheers of joy awakened Captain Paul',* which, in view of the struggle she had just experienced, clearly felt like inspiration - "Oh, that's how you do it," she remarked.

Tom

A different approach has been adopted for the presentation of this case study. Tom's control and HARRY assisted stories are presented in full, in Appendix 3. The HARRY assisted story was written in conjunction with the prompts presented in Appendix 1. Figures 2,3 and 4 depict some of HARRY's guidance for this story, exactly as it was delivered. Table 6 presents

the scores and reports calculated by CHECK TEXT. The difference in writing performance, both qualitatively and quantitatively, between the control and HARRY assisted stories is self evident. The writing process in which Tom was engaged can be partly inferred by examining the prompts in conjunction with each section of the HARRY assisted story.

Table 6. CHECK TEXT scores and reports for Tom's journey stories

7. Conclusion

HARRY aims to change the way children approach the task of writing. HARRY does this by prompting children to conduct an internal dialogue about the evolving text, causing them to reflect. Composing is simultaneously revising. By combining the sub-processes of brainstorming, planning, composing, reviewing and revising, the system successfully enables children to experience the thinking processes that occur in the heads of mature writers, provided they utilise the available facilities. The ability to deliver the different sub-processes of composition in any order makes HARRY consistent with the idiosyncratic way the mind works. HARRY solves the problem children have in coping with several tasks simultaneously by presenting different aspects of the process separately when requested. The expert knowledge delivered by the composing prompts, engages the children in a process of cognitive conflict, challenging them to devise alternative original ideas. HARRY's editing suggestions help children with proof reading their narratives. Commenting upon weaknesses can be a time consuming and repetitive task for human teachers. HARRY systematically and successfully detects many children's grammar and style weaknesses and is effective at guiding children through the processes of detection, identification and correction of their weaknesses. The fact that the HARRY assisted stories were better than the controls demonstrates the tool's architecture is sound. However, the system would benefit from further development to ensure children both interact sufficiently with HARRY and make effective use of HARRY's guidance. Ultimately of course, children need to learn to write effectively alone. Vygotsky's work suggests that children will learn to adopt the mature writing process through repeated experience of the type of guidance offered by HARRY, and that the scaffolding should be reduced gradually. This aspect will be the focus of future research.

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Appendix 1

Examples of the range of feedforward prompts delivered during the process of composing a story about an enchanted journey.

N.B. As the prompts are delivered randomly, each writer receives a different set of prompts. The Key prompts are dependent upon key words present in the text. If no key words are present, the next stage of the strategy is delivered.

Strategy	Guiding prompt	Ideas help	Word help	Sentence help	check
Welcome	The King is very ill. Travellers must fetch a special magic healing stone. Your story should be about the dangers they meet as they return with the stone. Make a list of ideas for this story in the box below.	This should be a mysterious story where strange things sometimes happen. The stone will probably nearly get lost or stolen several times on the way. How? Will your characters be modern or from the past? Will they be young or old?	explorers, rugged clothes, trailing cloaks, ventured, strode, lingered, plodded, ventured, trekked, dangerous, risky, challenge, quest, mission, strange.	Write down any good phrases you can think of which you could use later like: The mission was far harder than they could ever have imagined.	Come back to this or any other page to find ideas for what to write.
Start	Set the scene. Describe the King's Palace. Perhaps the King is ill on a bed and the courtiers are discussing what should be done.	Does the King sneeze or cough? Have a fever? Pale and weak? Do the servants speak loudly or in hushed whispers afraid to disturb the King? Is there a doctor examining the King?	Think of different adjectives to describe the palace like: vast windows, tiled ceiling, marble floor, sumptuous red velvet curtains, golden statues, magnificent candelabra,	Use similes to describe the size and splendour of the palace - as enormous as... As shiny as….as smooth as….magnificent like….cluttered like…..	Does your description flow well. Did you use lots of adjectives and adverbs. How about a simile?
Character	Tell me more about how the travellers chosen to undertake the difficult task of getting the healing stone introduced themselves at the palace.	Give them unusual names? Write about what the travellers say, think and do to show what they are like! How will they prove they are brave and courageous enough for the task?	Use words which show how someone feels like: suggested, interrupted, boasted, exaggerated, claimed. Were they looking serious or smiling, with a grin which stretched from ear	Use dialogue to show how confident they are"Of course I'm not scared, I killed a pit of snakes and wild wolves on my last mission!" or "It'll be easy, a piece of cake! I'll be back with that stone before	Have you given the travellers interesting names? How did the travellers prove they had the courage to undertake the mission?

			to ear, or something else?	you can say …" "Have no fear … is here!"	
Setting	Tell me how the travellers prepare for the mission. Describe the first part of the journey. Where do they find the stone?	Do they take any special equipment to help them on their dangerous journey? Perhaps a map, a rope, a knife, food and water? What do they all think of the stone when they find it? Boring and dull until….	gem, sparkled, shone, beautiful, gleamed, glistening, flashing, flickering, dazzling, glowing, quivering, as small as a…or as bright as…or it erupted like….	Build up to seeing the stone using two short sentences followed by a long. Like this: At last! There it was! The stone was lying on…in the middle of.. .next to….	Try to make the part where the healing stone is seen or touched for the first time really dramatic. Do lights flash and sparks fly? What sounds does it make?
Action	The travellers may stumble across a town on their journey back to the Palace.	Perhaps they buy food or equipment for the rest of their journey. Perhaps they stay the night at an inn.	comfortable warm beds, welcomed, exhausted, thankful, crowded, busy, hustle and bustle, noisy, market day, blare of music, loud chatter, shouted, pushed and shoved	Turning the corner…Further up the road…Across the street…Opposite…Outside….Beyond…When…With….	Do you think you could improve your description of the town? Imagine you have a camera to take some pictures. Describe what's going on everywhere.
Key (Town)	Not everyone turns out to be friendly and helpful in the town!	The stone could get stolen by a pickpocket!	hustle and bustle, chased, hot pursuit, cunning trick, thief, culprit, grabbed, snatched, zig zagging	Close on their heels…scaling a wall…pinned to the ground…brushed up close…caught sight of…. pushing through the crowd,	Make sure the travellers get away from the town safely with the precious stone!
Complication	I have a feeling something will go very wrong in your story soon! But maybe things don't turn out to be quite as bad as they seemed at first.	Perhaps something or someone could get lost or left behind or injured…Organise a search or rescue party! Or someone could land someone else into trouble by accident.	Everyone will be anxious and worried at first…then relieved, pleased, thankful or ecstatic when the lost person is found.	Build up the event with lots of sentences. Something could be glimpsed. Something could catch someone's eye. Someone could hear something important. Someone could move something and discover…	Did things happen too quickly? Could you have described what happened and the scene a bit more.

Action	Tell me about the route the travellers take on their way back. Do they meet anyone on the way? Are they friendly or not?	Get the travellers to talk about adventures they have had in the past, as they walk along the track. Maybe they meet a magician or a wizard. What do they say to each other?	Link words: next, later, eventually, after, before, clearly, among, behind, obscured by, opposite, in between. Words meaning walked: ambled, scrambled, strode, trekked, tramped,	Expand a short sentence like 'They walked down the path' into a long one like this 'They strode along the winding sandy path'.	Did you use lots of dialogue here? Did the travellers tell each other funny stories about other adventures they have had? Could you improve this part?
Key (magician)	Tell me more about the magician!	What is the magician like? Does the magician put them up for the night in his castle? What's the castle like? Was he pleased to see them or not? Perhaps he is helpful? Perhaps he casts a spell?	tall, long black cloak trailing behind, enormous floppy cone shaped hat, dusty ancient looking book, shelves laden with jars and potions	Try one of these sentence starters: Strangely, Oddly enough, Almost certainly, At that moment, One moment….next minute…Out of the blue…moved by itself…	Have you made the magician sound powerful and mysterious? Do unexpected things happen when the magician is around.
last	You've got to the last part of your story already! The travellers need to return safely and give the stone to the King!	Is there a heroes welcome (a party?) for the travellers when they arrive back at the palace? How ill is the King? Will the stone work? How will it do this?	ill, feverish, temperature, pain, anxious, fragile, weak, pale, collapsed, revived, recovered, happy, smiled, jubilant, danced, rewarded, congratulated	Your last sentence is the most important one! Perhaps you could end with describing what is happening right now as the story comes to a close.	Check your first paragraph. Does your last one fit in with what you wrote there?

Appendix 2: Examples of editing prompts

Punctuation

- Check the long sentence that begins […]. It may need breaking into smaller sentences. (Targeting sentences longer than 30 words).
- Check the sentence beginning […]. It may need commas. (Targeting sentences with more than 12 words without a comma, full stop, brackets or comma like words e.g. and, because).
- You may need a comma after the word [Targeting adverbs beginning a sentence].
- You may need a comma before the word [Targeting common connectives beginning a clause e.g. but, so].
- You may need a question mark at the end of the question beginning […] (Targeting sentences beginning with question words e.g. Who, Where, etc. punctuated with full stops).
- The word(s) […] needs an exclamation mark after it (Targeting one and two word minor sentences).

Vocabulary

- You have used the word [simple word e.g. said, big, went, got], you could use another like [examples].
- You have used the word [repeated common connective e.g. so, then], do you really need it?
- You have used the word [repeated topic word], Try an alternative like [examples].

Sentence construction

- Try not to use the word and more than once in a sentence. You could replace one and with a comma, or a full stop + another word which fits.
- You have three or more short sentences in a row. You could link two of them with a connective like: if, with, because, when, now, except, while, although.
- You have three or more long sentences in a row of almost the same length. Try breaking one of them into shorter sentences to vary them.
- You have used the word […] to start three or more sentences. Can you think of a different way to start them?

Appendix 3: Example stories

Tom's control story

Enchanted journey

The king was suffering from a type of aneserier a kind of sickness that could kill you so he had to get a magic stone to get his health back so he gathered his people and cried.
"People of Pamaliar I need someone to get this rummed magic stone " "we shall have tests! They start tomorrow in the afternoon so come if you want." So the very next day people from all over Pamaliar came to win the honour of getting the stone Scott smith informed his mum that there was tests and said "I'm going to enter" and hurried out the door

"Be careful Scott," yelled his mum. The 1st test was an obstacle course. The 2nd test was a skill test and the 3rd test was a staying calm test, and Scott passed them all so he got the job of retrieving the stone. So he set off well he got to the stone all right but on the way back he fell down a pit, meanwhile things were going haywire at the palace
"Were is he" said a guard
"We should sent a adult," said another
"But he did complete all the tests with no faults" said another. Meanwhile back at the cave Scott thought where am I anywhere I better get off this unstable ground it dropped onto spikes but Scott's quick instincts warned him to jump off it when it fell. But it was no time to think about it because a boulder rolled after him and he ran till he was flat on a wall he rolled out of the way. The boulder crashed into the wall it made a hole in the wall and Scott ran out, back to the palace with the stone then he gave the king the magic stone so he could heal himself.

Tom's HARRY assisted story

Enchanted journey

"WHAT?" cried the servant as he served breakfast.
"Hu!" asked the cook "what happened?"
"I think we'd all like to know that," said another servant.
"The king is ill!" The king was ill and know one could deny it. There he was sitting up in bed eyes just starering at the sparkling ruby mirror.
"And its supposed to be changing of the guard today," cried the servant.
"Calm down!" ordered the king "it will just have to wait now somebody must retrieve that healing stone. The servants rushed to court thew the glittering gold palace and though tall high doors like ladders. The king looked though the vast open window swounded in jewels and fell to the ground with tiredness.

"By order of King Robert, somebody has to surch for the fabled healing stone," addressed the servant. The crowd was astounded by the servant coming to court not the king, but then Frank the show off boasted
"Leave it to me I am by far the best!"
"No no no, we are having a tordament to find are Champion's," anounst the servant. So they had an obstacle corse to see who was best they had the show off, The three friends Cheeky, Rosie and Jacky, so they all set off.

So the three friends packed a flask of water, plenty of food, a rope, a knife, coathangers (for sliding down the rope), extra clothes and a bow with lots and lots and lots of arrows in three rucksacks. Then they set off. They soon found the dark cave. They entered very carefully and when they arrived at the stone's pillar it wasn't there, Frank had beaten them to it. When they approached the pillar, where the stone was there was an earthquake. They fell thew the ground where they pocketed the fake stone and decided to find Frank.

They thought of climbing up the rope. When they climbed to the top there was a landslide and a cave-in, so they jumped down the pit. When they folled a twisted tunnel, they spotted daylight ahead of them. Then they reriesd that they would have to cross a pit to reach it, so they pulled out the rope and they slid across on the coathangers. Two of them snapped. When they were finally across they dashed to the nearest town. Boy was it busy there was a hustle and bustle, they had to squeeze though the crowd to arrive at the inn. Choosing to stay the night. Cheeky woke them all up as a prank. Jack and Rosie were sad to leave the comfy warm beds, but after they had eaten a hearty breakfast they thought of buying supplies seeing as the inn didn't serve breakfast. Then they reriesed that the town always had blare of music on classical, jazz or about just anything in the crowded coulbled streets. There was dazzling performances every hour and tons of chatter. Seeing as it was a Cliffside town, about everybody came there, to try superb drinks from the pub. Watching Frank chatting to what must be his friend, they came in and told Frank,
"That is not the true stone that is just a mirror image." Cheeky traded the false stone for the true one, then Frank yelled see you losers and he speed though the towns narrow streets into the next cave.

As they set off a man came speeding up to them and snatched the stone.
"Stop thief" the children cried. Soon there was an hot pursuit zig zagging though the town. Soon the culprit reriesed they were hot on his trail. He panicked and charged straight into a lamppost. He chrased to the ground. The children not missing there chance raced up to him, grapped the stone, took the man to the police and dashed away before anything else happened to the next cave.

"Help," cried a voice.
"Help!" there it was again.
"HELP!!!" I thought I heard a voice Rosie told the others Jack gave Cheeky a sideways look the children stumbled forward and found Frank clinging on for dear life. Rosie told the others that if they worked together they would be able to rescue him. So Rosie held Jacks hand and Jacks other hand held a rock. Frank grapped Roises hand, but because of the weight Jacks hand slipped off the rock! Cheeky leapt into action by grabbing Jacks hand and reeling them in like a fisherman would with his catch! They didn't have to do that they could have just left Frank to die. They saved him they were all relieved asellpel Frank. Then they yanked out the rope. The three friends slid across on coat hangers and Frank monkybared across.

As they travelled back to the palace, they talked about the adventures there'd been on, when they came across a little cottage, they knocked on the door. It was clearly a magician who lived there because he had robes on. He looked friendly, but they approached carefully.
"I don't trust him" whispered Frank.
"I don't either" replied Jack in a whisper.

The magician was very tall. He had a trailing black cloak dropping down behind him and a pointed hat.
"Well, well, well, what do we have here" the magician muttered to himself and he asked.
"What are you doing here?" "Nether mind Your returning to the king aren't you.
"Yes, we are" replied Cheeky "how did you know?"
"I just know," replied the magician, "now come on in, I have a few things you might like." So they popped into the magicians cottage and he gave them a potion to drink when they were going on their way. They ate and drank to there hearts content, then they rested until the morning when they bid farewell before they left.

"Come on come on" cried the servant "aha there here." The children found that the potion had transported them straight to the palace where the king was just about to die when the servant shouted for joy.
"They're here oh, well done!" So they went directly to the king, they tried Franks stone (the fake one). It didn't work they were worried. Quickly they produced the real stone, but it didn't work!
"Oh, no!" shouted the servant in alarm. As if he knew the magician broke in and suggested frantically.
"Poor this potion on the real stone it will make it work."
"How do you know?" asked Jack.
"I kown because I made them" replied the magician. So they poured the potion on, it worked. They thew a royal party and everybody was invited.

Tables

Table 1. CHECK TEXT assessment boundaries

CHECK TEXT feature	Poor	Fair	Good
Total number of words	Less than 290 words	290-390 words	More than 390 words
Variety of words in first 100	Less than 61%	61%-67%	More than 67%
Ands used to total words	More than 4.4%	2.6%-4.4%	Less than 2.6%
Common connectives	More than 2%	1.5%-2%	Less than 1.5%
Simple Sentence Starters	More than 50%	37%-50%	Less than 37%
Average sentence length	More than 16 words	8-12 words	12-16 words
Number of words over 5 letters	Less than 13.5%	13.5%-17%	More than 17%
Common verbs used to total words	More than 5.5%	4.2%-5.5%	Less than 4.2%
Adverbs used to total words	Less than 0.7%	0.7%-1.5%	More than 1.5%
Common words to total words	More than 11.5%	8.5%-11.5%	Less than 8.5%
Mean words per sentence (use of full stops)	More than 18 words	14-18 words	8-14 words
Sentence length to commas ratio	More than 2	1-2	Less than 1

Table 2. CHECK TEXT scores for Sarah's space stories

Sarah's space stories	**1st story**		**2nd story**	
Feature	**Score/report**		**Score/report**	
Total number of words	213	Poor	181	Poor
Variety of words in first 100	60%	Poor	67%	Fair
Ands used to total words	1.9%	Good	3.3%	Fair
Common connectives	0.9%	Good	1.7%	Fair
Simple sentence starters	52.6%	Poor	40%	Fair
Average sentence length in words	11.2	Fair	12.1	Good
Number of words over 5 letters	23.9%	Good	26%	Good
Common verbs used to total words	4.7%	Fair	4.4%	Fair
Adverbs used to total words	0.9%	Fair	0%	Poor
Common words to total words	7.5%	Good	9.4%	Fair
Mean words per sentence	11.2	Good	12.1	Good
Sentence to comma ratio	0.7	Good	0.9	Good

Table 3. CHECK TEXT scores for Laura's space stories

Laura's space stories	**1st story**		**2nd story**	
Feature	**Score/report**		**Score/report**	
Total number of words	593	Good	523	Good
Variety of words in first 100	68%	Good	51%	Poor
Ands used to total words	4%	Fair	2.1%	Good
Common connectives	1.5%	Fair	2.1%	Poor
Simple sentence starters	32%	Good	28.1%	Good
Average sentence length in words	11.9	Fair	9.2	Fair
Number of words over 5 letters	10.1%	Poor	14.1%	Fair
Common verbs used to total words	4.6%	Fair	5.7%	Poor
Adverbs used to total words	0.3%	Poor	1.3%	Fair
Common words to total words	10.1%	Fair	9.9%	Fair
Mean words per sentence	11.9	Good	9.2	Good
Sentence to comma ratio	4	Poor	∞	Poor

Table 4. CHECK TEXT scores and reports for Sophie's stories

Sophie's wood stories	**Control**		**1st stage**		**2nd stage**		**3rd stage**	
Feature	**score/report**		**score/report**		**score/report**		**score/report**	
Total number of words	376	Fair	658	Good	676	Good	663	Good
Variety of words in first 100	76%	Good	79%	Good	79%	Good	78%	Good
Ands used to total words	2.4%	Good	3.5%	Fair	3.1%	Fair	3.2%	Fair
Common connectives	1.9%	Fair	1.7%	Fair	0.9%	Good	1.1%	Good
Simple sentence starters	18.2%	Good	22.2%	Good	21.6%	Good	31.7%	Good
Average sentence length in words	17.1	Poor	36.6	Poor	18.3	Poor	16.2	Poor
Number of words over 5 letters	16%	Fair	18.1%	Good	18.6%	Good	18.3%	Good
Common verbs used to total words	4.3%	Fair	4.7%	Fair	4%	Good	4.1%	Good
Adverbs used to total words	0.8%	Fair	1.7%	Good	1.9%	Good	1.8%	Good
Common words to total words	8.5%	Fair	9.9%	Fair	8%	Good	8.3%	Good
Mean words per sentence	17.1	Fair	36.6	Poor	18.3	Poor	16.2	Fair
Sentence to comma ratio	2.8	Poor	7.3	Poor	1.5	Fair	1.1	Fair

Table 5. CHECK TEXT scores and reports for Rachael's pirate stories

Rachael's pirate stories	**Control**		**1st stage**		**2nd stage**		**3rd stage**	
Feature	**score/report**		**score/report**		**score/report**		**score/report**	
Total number of words	350	Fair	699	Good	744	Good	745	Good
Variety of words in first 100	67%	Fair	70%	Good	72%	Good	72%	Good
Ands used to total words	2%	Good	2.6%	Fair	2.3%	Good	2.3%	Good
Common connectives	1.7%	Fair	2%	Fair	1.9%	Fair	1.9%	Fair
Simple sentence starters	39.3%	Fair	50%	Fair	32.8%	Good	32.8%	Good
Average sentence length in words	12.5	Good	15.2	Good	12.8	Good	12.8	Good
Number of words over 5 letters	14.9%	Fair	13.9%	Fair	14.8%	Fair	14.8%	Fair
Common verbs used to total words	3.4%	Good	5.9%	Poor	5.1%	Fair	5%	Fair
Adverbs used to total words	0.3%	Poor	0.7%	Fair	0.9%	Fair	0.9%	Fair
Common words to total words	7.1%	Good	10.4%	Fair	9.3%	Fair	9.1%	Fair
Mean words per sentence	12.5	Fair	15.2	Fair	12.8	Good	12.8	Good
Sentence to comma ratio	∞	Poor	15.2	Poor	0.9	Good	0.8	Good

Table 6. CHECK TEXT scores and reports for Tom's journey stories

Tom's journey stories	**Control**		**1st stage**		**2nd stage**		**3rd stage**	
Feature	**score/report**		**score/report**		**score/report**		**score/report**	
Total number of words	306	Fair	1096	Good	1099	Good	1096	Good
Variety of words in first 100	66%	Fair	76%	Good	75%	Good	73%	Good
Ands used to total words	2.3%	Good	4.1%	Fair	2.8%	Fair	2.7%	Fair
Common connectives	4.2%	Poor	3.3%	Poor	2%	Fair	2.2%	Poor
Simple sentence starters	40%	Fair	31.4%	Good	29.5%	Good	31%	Good
Average sentence length in words	30.6	Poor	21.5	Poor	13.9	Good	12.6	Good
Number of words over 5 letters	15%	Fair	16.5%	Fair	18.8%	Good	17.7%	Good
Common verbs used to total words	6.2%	Poor	4.1%	Good	2.3%	Good	2.3%	Good
Adverbs used to total words	0%	Poor	0.5%	Poor	0.7%	Fair	0.7%	Fair
Common words to total words	12.7%	Poor	11.5%	Fair	7.1%	Good	7.2%	Good
Mean words per sentence	30.6	Poor	21.5	Poor	13.9	Good	12.6	Good
Sentence to comma ratio	6.1	Poor	21.5	Poor	0.4	Good	0.3	Good

Figures

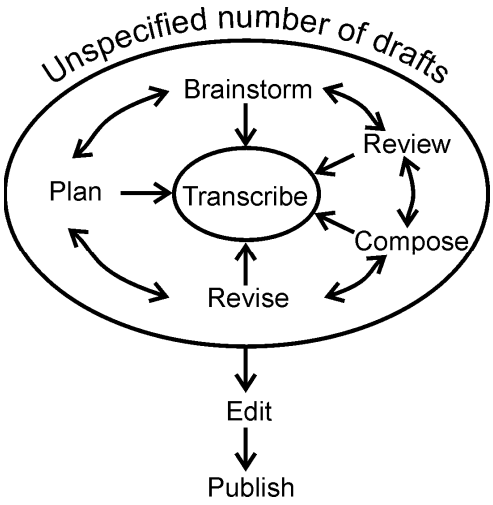

Figure 1. The idiosyncratic model underpinning HARRY during the writing process.

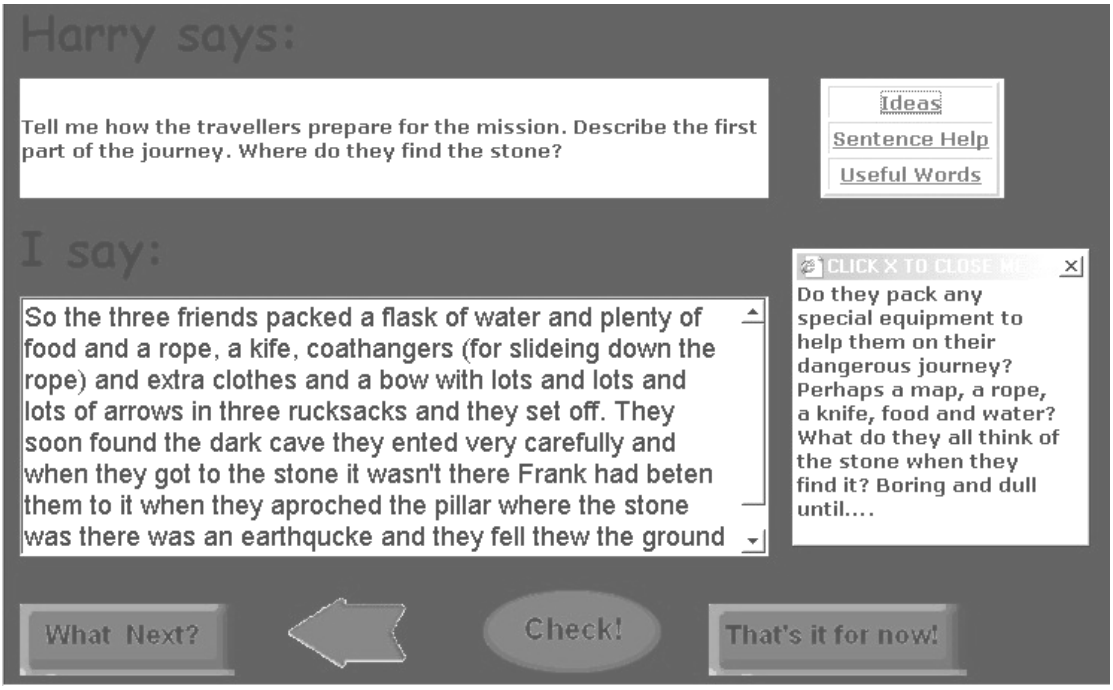

Figure 2. Screen design for stage one (blue background) with the ideas pop-up box open

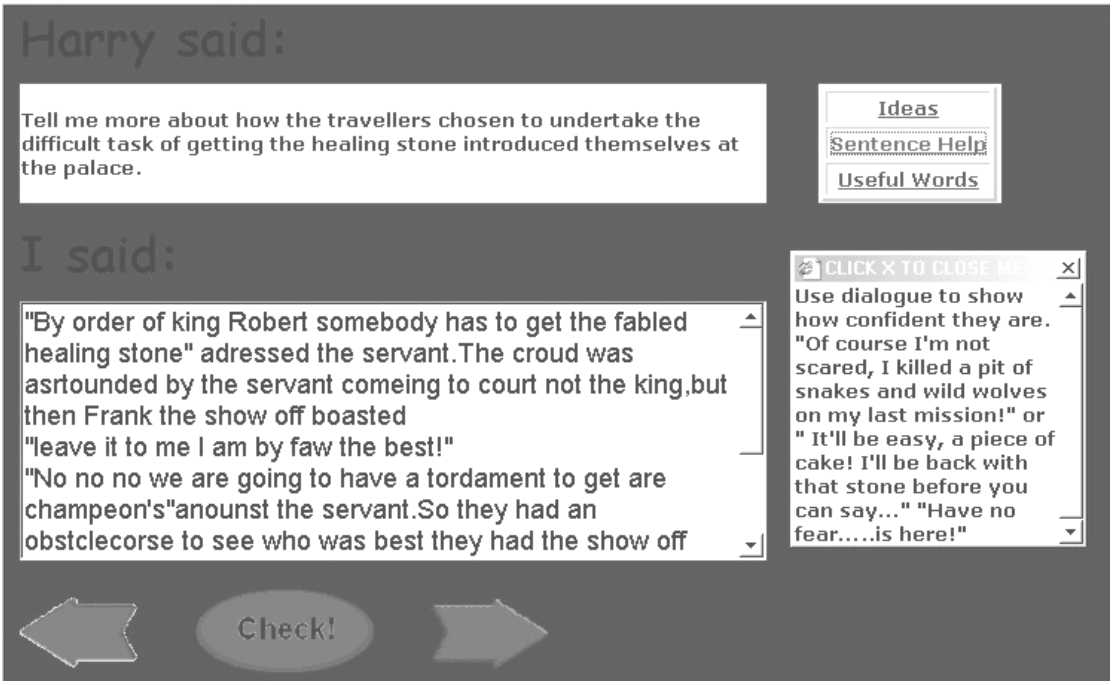

Figure 3. Screen design for stage one, displaying an earlier section of the story (sentence help pop-up box open)

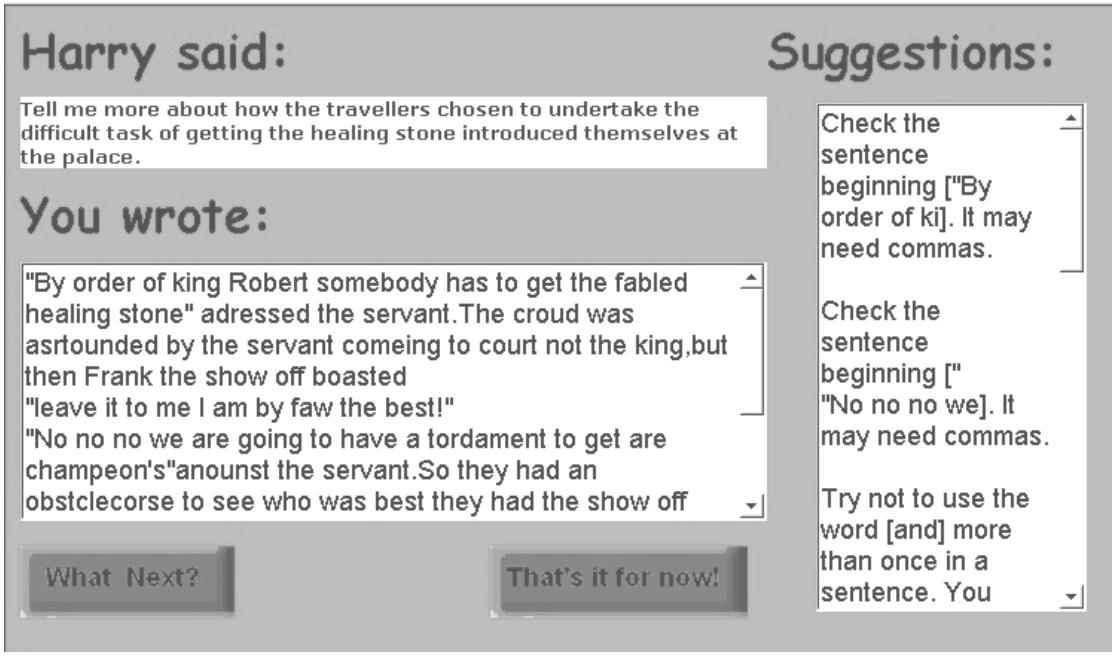

Figure 4. Screen design for stage two (green background) showing editing suggestions