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PLEASE SCROLL DOWN FOR ARTICLE
‘He’s gone and wrote over it’: the use of wikis for collaborative report writing in a primary school classroom

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Wikis (websites that can be edited quickly by multiple authors) were used with upper-primary school children to write group reports on a science topic. Two teachers observed the children working, and their observations were used alongside the texts from the wikis and group interviews with children to explore the question of whether using wikis would lead to a change in writing practices and attitudes. This study found that although children often felt proprietorial about their texts, there was some evidence of negotiation and of joint content building. There was also evidence of peer-supported learning of information and communications technology (ICT) skills. Furthermore, the quality and quantity of writing were greater when using wikis than in conventional writing contexts, and the groups which engaged in more discussion produced more text.

Keywords: writing; literacy; collaboration; wikis

Introduction

This article is a narrative account of a case study which explored whether pupils in the upper stages of primary school could have their attitudes and engagement with writing practices transformed through participation in collaborative writing using wikis. As Cohen, Manion, and Morrison (2007) explain, in narrative presentation of a case study, findings and discussion are presented within the description of this research. This means that although this article broadly falls into conventional sections: contextual and theoretical background; methodology; presentation, analysis and discussion of results and, finally, conclusions, the implications of this research are discussed throughout the text.

The aim of this study was to explore whether the wikis would allow genuine collaboration in creating multimodal digital text. The underpinning rationales for this were, firstly, that collaboration can scaffold writing development; secondly, that collaborative writing might help the children to increase their knowledge of the topic and, thirdly, that online, multimodal, collaborative writing is a digital literacy skill which children need to learn and practice.

The motive for using wikis, simple websites that can be edited by their users, was to reflect new electronic literacy practices and to allow pupils to engage in joint enterprise to work on a shared product. This study explored how mediating writing
through a wiki might realign pupils’ interactions with peers, and considered changes to general literacy practices that have resulted from technological innovation. This study attempted to look beyond the specifics of using a wiki and evaluate the significance of pedagogy and learning relationships. This acknowledged the assertion by Condie et al. (2007) that the use of ICT in schools needs to concern itself with more than practical aspects. A particular focus of this study was pupils’ face-to-face, and virtual, interactions and their effect on participants’ confidence.

The research questions were:
How do children create identity and interact with others in a digital workspace?
To what extent do children discuss, collaborate and share content in a digital workspace?
To what extent does a digital workspace facilitate joint creation of knowledge?
To what extent do children author multimodal texts?

Background
This study took place in a large suburban primary school in the West Midlands of England. The wider context is within debates about literacy: both about standards of literacy achieved by schoolchildren and about what ‘literacy’ means in the twenty-first century. Standards of writing throughout the education system are a perennial topic of disquiet among the media and employers. These concerns are reflected in news articles (Garner 2007; BBC 2009) that describe ‘txt’ skills as supplanting basic spelling and grammatical conventions and in surveys which produce figures suggesting that the majority of employers are anxious about levels of literacy among graduates (BBC News 2008). Furthermore, there is debate over the very definition of literacy, with Kress (2003), Lankshear and Knobel (2006) and Merchant (2007) calling for a broader understanding that encompasses new digital forms, multimedia imagery and informal modes of writing outside the accepted canon of high literacy. The controversial nature of the subject is implicit in Wray and Medwell’s (2002) assertion that literacy is a litmus test of ‘educatedness’, with discussion further coloured by predictions of the future needs of the economy. These foresee a need for literate workers, equipped with a range of flexible ICT skills, as a prerequisite to success in a global ‘knowledge-based economy’ (OECD Information Technology Outlook 2002).

The contention by Kress (2003) that there has been a ‘revolution’ in twenty-first century literacy practices implies that education systems need to rethink the teaching and support of literacy. This should include the shift from book to screen that Kress identifies and also consider the use of images to convey meaning. The consequences of technological innovation on the teaching of writing is also addressed by Snyder (2001) who believes pupils now need to develop understanding and skills across a number of domains to become literate in a ‘New Communicative Order’. This view of literacy consists of new technological forms of writing that are socially based (e.g. social networking sites such as Facebook) and which require proficiency in operational, cultural and critical dimensions, as reading and writing move beyond traditional paper genres to include screen-based forms of expression.
The shift towards screen-based literacy in the lives of children (through computers, Internet-enabled mobile devices and games consoles) means that they are engaging in literacy practices that are substantially different from the book/paper paradigms of the classroom. In their lives outside school, children are learning to read and create digital texts and to engage in textually mediated online conversations (often enhanced by images and video). In the classroom, however, the tendency is still for children to be writing with pencil and paper and to use books as the main textual resource. This means that classroom literacy practices may appear increasingly irrelevant to pupils, because these practices are so divergent from their ‘real-life’ experience (Green and Hannon 2007). This might be seen as a continuation of Prensky’s (2001) concept of ‘digital natives’. However, the ‘digital natives’ idea has been widely critiqued (Baynes and Ross 2007; Bennett, Maton, and Kervin 2008; Bennett and Maton 2010; Brown and Czerniewicz 2010; Helsper and Eynon 2010; Jones et al. 2010) and is not really germane to this discussion. Green and Hannon (2007), however, found that there was a genuine disjunct between home and school uses of technology and that, in many cases, children had access to a wider range of devices and more up-to-date technology at home than at school and that, at home, children used technology in more diverse ways than they did at school.

This changing experience and definition of literacy suggest a need to move away from the type of didactic teaching practice observed by Hardman, Smith, and Wall (2003). Their research revealed that closed questions were the most common type used in the school literacy teaching. They found that teachers sought predictable correct answers and only rarely assisted pupils to elaborate ideas. Hardman et al.’s findings call for a more social constructivist approach to literacy that would relate learning to existing experiences and understanding, and make much greater use of talk. They argue that this would enable pupils to propose and develop ideas and that this would allow them to be more actively engaged and so learn more effectively. Hardman et al. were concerned that many teachers used whole class literacy teaching in a way that was very teacher centred and which did not present many opportunities for pupil talk. It should also be noted that many informal literacy practices are dialogic; much of the writing that children do outside the contexts of classroom or homework will be in online text-based environments such as Facebook, instant messaging or multiplayer games (Gee 2007). The purpose of the text in these contexts is conversation, either social chat or task-based (e.g. arranging a social activity through Facebook or joining a game task). Combining Hardman et al.’s view about the importance of talk in literacy teaching with the role of dialogue in children’s own literacy practices suggests that a text-based dialogic model could be fruitful in the classroom teaching of literacy. This would allow children to engage in the active articulation of ideas in a ‘talky’ way with written outcomes.

There are several tools for dialogic text (such as synchronous and asynchronous computer-mediated communication (CMC), blogs, social networking and wikis). With CMC tools and social networking sites, the dialogue is often in itself the outcome (or there may be a task outcome that is outside the dialogic environment). Blogs can be extremely useful for audience-focussed writing but are designed for a single author to voice each block of text. Wikis, however, are designed for creating collaboratively authored texts. A wiki text can be constructed collaboratively with every member of the task group having the opportunity to create and edit. Furthermore, each wiki article page is accompanied by a discussion page where authors can introduce, justify, argue and develop ideas for inclusion in the main text.
Because of these affordances, wikis have the potential to support a more relevant pedagogy for writing by providing pupils with networked experiences, active participation with peers and a less teacher-centred approach to learning.

A survey of literature appears to show that wiki technology has not been explored as a pedagogical response to changing definitions of literacy within primary school education. Several studies have looked at wikis for collaboration in educational settings, but most have focussed on university-level teaching. Moskaliuk, Kimmerle, and Cress (2009) explored undergraduate knowledge building through editing of wiki text, although it is not clear how this work differed from editing of any partially completed text. Witney and Smallbone (2011) looked whether undergraduates chose to use wikis for collaborative tasks (and found that they did not tend to choose wikis). Naismith, Lee, and Pilkington (2011) also worked with university students and found that although the students responded positively to the wikis, there was little joint-authoring of pages (a finding echoing Wheeler, Yeomans, and Wheeler 2008 and Grant 2009). Trentin (2009) asked whether wikis could help with the assessment of group work among undergraduates. One study that has researched wikis in school settings is Grant (2009) in which wikis were used with students aged 13–14. Grant’s study explored the idea that wiki use might support knowledge building within a developing community of practice. However, she found that the dominant classroom paradigm of writing as individual activity inhibited the collaborative practice that a wiki can afford.

Methodology

This research was conducted as a case study, defined by Cohen, Manion, and Morrison as ‘a specific instance…designed to illustrate a more general principle’ (2007, 253) looking at a single class within one school. Cohen, Manion, and Morrison argue that the value of a case study lies in the fact that allows phenomena to be explored within an authentic context and thus can produce rich data about interaction and relationships. Cohen et al. point out that the researcher is likely to be an actor in case study research and that the role taken by the researcher becomes a part of this study. In this case, the researcher was a visitor to the classroom (a local authority advisor) but, within the research, took the role of assistant teacher. This presence of an additional adult allowed both the researcher and the class teacher to carry out detailed observation of pupils while they were working. Thus, one of the main data sources was participant observation, while another was close examination of the data provided within the wikis – both the main project pages and the discussion pages. The third source of data was semi-structured group interviews with the children in order to determine their perceptions of the project and their work. One of the ways to increase validity of research is triangulation (Cohen, Manion, and Morrison 2007), and one type of triangulation involves using a mixture of data collection methods thus allowing different perspectives of the case.

Context and participants

The school had an ICT suite with 15 personal computers and a mobile trolley holding 18 laptops. An Ofsted report had identified a strong cross-curricular approach in the teaching of English and ICT, with opportunities for collaborative learning that the report had labelled ‘outstanding’. The staff’s confidence in
information technology had also been acknowledged with the award of the ICT mark, a nationally recognised accreditation scheme for reaching a standard of maturity in the use of technology. This profile made the school a good candidate for trialling the use of a wiki given the observation by Grant (2006) that pupils’ initial reaction to participation in online writing groups is a transferral of existing practices from the broader classroom culture. The children had used computers in literacy lessons with basic, occasional, word processing, but there was no embedded or developed use of computer-aided writing. Screen-based texts in literacy sessions were not a usual aspect of the school’s practice, though ‘research’ on the Internet was usual for subjects such as science or history.

Twenty-six pupils, 14 boys and 12 girls, aged 9–10 took part in this study. The teacher identified a high proportion of the boys as ‘reluctant writers’ who often struggled to complete written tasks and expressed a dislike of writing. This study is not engaged in looking at gender-related issues, but the fact that a number of children in this study apparently disliked writing will be relevant when looking at the children’s behaviours when working with the wikis.

Before the start of this study, the children’s access to technology and engagement with writing outside school were gauged with a survey. The results suggested a majority were well placed to take advantage of the anywhere, anytime possibilities of collaborative writing that a wiki might offer. Three quarters of the class had access to the Internet from a home computer and a quarter of the children had a broadband connected computer in their own bedrooms. However, most children did not generally write at home, even with non-digital tools. The most popular forms of writing that did take place were stories, poetry and diaries. Only one child had ever written a non-chronological report on his/her own initiative. These two findings – high levels of access to computers and broadband but little engagement at home with writing – supported the hypothesis that there might be a role for wikis in helping the children to make more use of technology for writing and to engage more with writing outside school.

Setting up the project

The wiki-supported writing took place within the context of project work about the solar system, a topic that had already been covered in science lessons. The activities that surrounded use of the wikis had two main teaching aims: firstly, increased knowledge of the planets in the solar system and, secondly, understanding of the structure and conventions of the non-chronological report genre. To help pupils understand the genre, they developed report outlines using mind-maps and were also given paper writing frames. The writing frames were provided because this technique was familiar to the pupils and also enabled them to continue with the writing even when they did not have access to computers. Some of the children discarded the writing frames at an early stage, while others continued using them throughout the writing process. Interestingly, the boys who had been identified by the teacher as reluctant writers tended to discard the frames and work entirely with the computers. Pupils also had access to books and online resources about the solar system, including Wikipedia.

Pupils were put into six groups with each child having an individual computer on which to work. Four of the groups (orange, yellow, green and red) were of mixed gender and ability to see if a collaborative/supportive practice developed amongst children who did not normally work together in class. Two groups were of above average children only: one all boys (blue group) and one all girls (silver group); boys
were a particular issue as the class contained a number of able boys whom the class
teacher felt were underachieving in writing.

The class was split to ensure the children had one-to-one access to a computer.
About half were taken to the school’s computer suite with wired in desktops. The
other half worked in the class with wireless laptops. This was only achievable because
other teachers agree to go without access to suite/laptops during the project. It was
also made possible by the researcher taking a teacher role with one half of the class.
The organisation of the classroom furniture remained the same; this was a mixture of
rows and table blocks. Splitting the class made the atmosphere in both rooms more
relaxed; the space increased and the volume of conversation lowered to an amiable
rumble. Smaller numbers enabled both the class teacher and the researcher to observe
pupils to a greater extent than would normally be possible in class.

Each group had its own wiki in which the children could produce collaboratively a
report about the solar system. The topic was chosen as it had been covered by the class
during a science unit earlier in the year and had proved a popular theme. Groups
planned the structure of their reports in face-to-face meetings to decide the areas of the
subject they would cover, and how to arrange information between pages. The groups
then had to decide how to organise their activity. A wiki page, though open to co-
authorship, can only be edited by one user at a time. This resulted in pupils each taking
one element of the solar system, creating and naming a page after it and then starting to
write a report by adding their own text and images on that aspect of the topic.

A priority in the early stage of this study was to reduce the direct involvement of
teachers, as teacher intervention might have inhibited pupils’ interaction and mutual
engagement with the wiki. The aim was to foster a refocusing of pupils’ perception of
the teacher as the main legitimate arbitrator of their activity, and enlarge the extent
to which peers were regarded as capable of supporting shared construction of
knowledge by commenting and scaffolding the activity of all group members. One
method of decreasing the number of teacher interventions was to provide a handout
for pupils to record their username, password and website address for their wiki. The
handout also contained links to relevant online resources and the report structure
concept map. This was effective in reducing the occasions pupils came to teachers for
information that had already been covered.

The teachers had a wiki of their own which was used to provide controlled access to
elements of support these included notes on the characteristics of a report, activity
sheets, examples of the genre, links to Internet sources and an embedded video
explaining a wiki. This wiki was used to promote effective organisation of learning
materials during this study and acted as a planning document before it started. The
sequence of planned learning activity could be easily viewed, and evaluated, by teachers
involved who used the wiki to coordinate the planned project with less need for face-to-
face meeting.

The teachers’ wiki included a list of websites for the children’s research so that
the pupils maintain focus on developing the wikis and avoiding distraction that
could have resulted by trawling through (possibly irrelevant or inappropriate) search
engine results. Children did use Google but this was mainly for locating images. This
suggests that the sites provided in the bookmarked list had sufficient material for
pupils to research the solar system.

Children were not allowed to use their own names in the discussion tab but had
to take on anonymous nicknames; they were also not permitted to upload
photographs of themselves to the wikis. The rationale for these rules was to protect
children’s identity and prevent any potential approach by adults from outside the school that might result were they identified through online activity. Pupils understood and accepted the motive for the precautions, and there was no indication that they restricted participation in this study. Use of nicknames and avatars to represent pupils may, in fact, have supported engagement, as they were consistent with the use of online identities in Internet chat rooms used by children, such as Habbo Hotel, and associated learning to write with the types of online leisure activities in which pupils might engage.

Results, analysis and discussion

Identity and personalisation

The names pupils adopted quickly became known among the class, and there was no confusion over the source of messages that appeared in the discussion panel. Pupils were very interested in changing the profile images that were displayed alongside their nicknames, with some children changing their icon several times before deciding on one. This form of personalisation was characteristic of pupils’ exploration and developing practices within the wiki that developed independently of teaching staff. Changing profile icons was not introduced formally to the children during this study, but a pupil’s discovery and knowledge of the techniques quickly transmitted itself round the class through face-to-face interactions. The face-to-face sharing of knowledge was observed throughout this study, as was a developing practice of coordination and content sharing that emerged through the discussion feature.

Plagiarism, creativity and copyright

Observation of pupils using on-screen and paper sources revealed different methods of removing and transferring information to the wikis. In one technique, extracts from books or screen were paraphrased and reworded by pupils using writing frames or by typing directly into their wiki. This is the sort of writing behaviour generally welcomed by teachers, particularly if the work is accurately spelt and punctuated, as it suggests that pupils are developing the ability to analyse, summarise and reapply information to different contexts. A much more ambivalent response could be expected to the second, and more frequently used process observed in this study. This involved sentences and whole paragraphs being copied with pen, retyped without alteration, or simply highlighted and pasted into the wikis. Initially, this lifting of information caused apprehension among teaching staff. It raised concerns about plagiarism, and the value of work that pupils were producing in their wikis. However, discussions with pupils showed that none wished to claim ownership of this material, and subsequent analysis of the wikis’ history tabs suggests that copying was part of a transfer process. Analysis of the editing history and discussions with children suggest that they captured information in order to digest its significance, restructure and amend it according to the meaning they wished to convey in writing. Copying could be seen as part of a process of interpretation and integration; a way to read a text, then as a basis for a rewritten explanation that is placed within a context that pupils’ construct to make meaning. It may be significant that none of the children tried to hide this behaviour; all acknowledged the material they had duplicated, and none said that reusing text without alteration was legitimate.
Explanations of why this would be wrong included the rights of the original author and the possibility of misleading their readers. Children regarded using their own voices in writing to be an essential part of their activity. This reflects the literacy practices that are encouraged by current assessments in primary schools which require writing to be the original product of the individual child’s effort.

These different conceptions of the process of writing had implications for the collaboration in this study, as pupils’ perception of writing as an endeavour for the individual inhibited adoption of the affordance of joint authorship and editing that the wikis offered. The class had looked at the practices of Wikipedia earlier in the school year and was aware that it was produced by an informal group of volunteers. Despite this, and despite pupils’ frequent use of Wikipedia as a source of information during this study, it was not apparent that children recognised the similarity between their own project and the joint enterprise represented by the online encyclopaedia. Pupils did not enquire how to edit an entry in Wikipedia; such a request would have demonstrated a concept of how information can be constructed collaboratively and an awareness of evolving literacy practices in a ‘New Communicative Order’ described by Snyder (2001). It is possible such a link would develop with greater use of the wiki. This would foster an increased preparedness to edit the work of others among pupils, and signal a change in perception that redefined editing the writing of someone else as judgemental, or a negative criticism.

Discussion, collaboration and sharing content

Each page created in pupils’ wikis had a discussion tab that allowed users to post messages to one another. This feature was modelled and explained to the class as a means to communicate, suggest amendments, request support from pupils who might know more, and seek agreement how to develop the wiki. After the discussion tab was explained, and rules stipulated for its use, there was no further intervention by teachers. This allowed the interpretation and exploitation of its affordance by pupils to be observed, without the influence of formal guidance that may have inhibited the use of their literacy practices from outside of school when participating in this study. This was the first time pupils had made use of computer-mediated communication in class, and the discussion feature was a popular facility with many children who used it in a variety of ways during the writing of their wiki.

The quantity and character of pupils’ dialogue recorded in the discussion tabs varied, but a factor common to all groups was that the majority of postings made were in the home page. Using the home page was a response to confusion at the start of this study. Pupils assumed that the discussion tab was the same for every page, and were initially puzzled when recipients of their message could not locate them. When it was realised that each page had its own tab, pupils notified one another by word of mouth and decided to use the home page for messaging as it would be easier to monitor. Employing the home page discussion tab as a notice board for the whole wiki is not its intended function but could be seen as an attempt by pupils to build a common practice meaningful and consistent with their understanding of the activity. It was adopted by all groups and could be seen as pupils developing a practice through face-to-face discussion. This was independent of teachers and anticipated the limited emergence of a shared repertoire of practices through the wikis themselves.
As Table 1 shows, the groups varied considerably in the number of discussion posts, and there was no relationship between the number of discussion posts and the number of completed pages. The blue group made most use of the discussion tab with 93 posts, and pupils working in this wiki regularly commented on the rising number of messages they created to other children during this study. When interviewed after the writing project, they explained that the number of posts was an outcome in itself and indicative of how well they had worked together. They viewed the discussions as a result of their activity alongside the information texts they had written in the main wiki pages. This demonstrated awareness that the wiki was an opportunity for joint activity and collaboration and may explain the motivation behind a significant number of the messages sent between group members that often elicited support and opinions from other pupils on their writing.

Pupils’ interactions in the discussions tabs were generally short and used an informal or ‘chatty’ style of writing common to online social networks. This was characterised by spontaneous and informal exchanges, similar to the one between pupils using the names Sophdav and Cheekycb who worked together in the silver wiki:

Sophdav: have u gt sme info yet! and jde
Cheekycb: i have got well lots of info look at sun
Chelsea: hey
Cheekycb: look on sun it looks well good

This style of writing, evident throughout pupils’ exchanges in the discussion tab, is distinct to the formal genres pupils become familiar with through school. It abandons the conventions concerning capital letters, punctuation and certain spelling patterns to use shorthand forms instead. Pupils automatically adopted this chatty style of writing in the discussion tabs, despite an initial teacher post in each wiki written in formal punctuated English. Pupils did not follow this standard written form, or ask permission to switch to the ‘chatty’ style of writing they adopted. Children seem to recognise this area of the wiki that did not need to conform to standard rules of writing and belonged to the new literacy practices they had experienced outside of school when using instant messaging, text messaging and social networking sites. Pupils’ familiarity with this style of writing, and the nonchalant manner they instantly applied it within the formal setting of school, is illustrated by the following exchange:

oggie1: look at my pic
boggy: TY YOU NEED TO CHANGE YOUR PIC RAPIDLY.

| Table 1. Discussion postings, completed pages and evidence of joint authorship by group. |
|---------------------------------|------|------|------|------|------|------|
| Groups                         | Silver | Blue | Orange | Yellow | Red | Green |
| Number of discussion postings  | 73    | 93   | 28    | 27    | 22  | 45    |
| Completed pages in wiki        | 19    | 9    | 10    | 13    | 6   | 7     |
| Percentage of pages showing    | 50    | 89   | 80    | 40    | 71  | 70    |
| evidence of joint authorship   |       |      |       |       |     |       |
This example also eschews sentences, conventions of standard written English, and demonstrates how an imperative can be conveyed in an online forum with the use of capital letters, sometimes called ‘shouting’. It reflects the pupil’s relaxed relationship with one another that was an asset to their collaboration during this study; oggie1 changed the picture after this exchange. The use of ‘chatty’ writing was, however, contained within the discussion tabs and did not ‘spill over’ into the formal wiki pages (Figure 1).

Pupils were very clear in the post-task interviews that ‘chatty’ was not an appropriate form for the main part of the wiki. In the main pages, pupils consistently observed the normal conventions of standard written English to the full extent of their written knowledge; they also made efforts to go beyond their existing writing capabilities with the frequent use of dictionaries and questions to peers and teaching staff about the correct spelling of unknown words. This evidence tends to contradict the popular contention that ‘txt spk’ may damage children’s ability to use and write formal language. The children clearly understood that chat and formal writing are different genres and showed considerable skill in using genre-appropriate language forms in each context. This supports Crystal’s view that ability to use ‘txt’ language requires knowledge of ‘correct’ language forms and their use.

Another exchange demonstrates the sharing of content online, with potential to modify the actions, attitudes or beliefs of the participants:

bluemini: what is the is the nine planets in the solar system
sth0: mars,jupitar,earth,mars,mercury,venus,saturn,neptune,pluto! do you know the info website?
bluemini re: no not yet

This interaction, like the request for an opinion made by oggie1, resulted in the modification of pupils’ knowledge and activity. Pupils did not wait to be invited to offer advice, and opinions that were not elicited also resulted in the development of the wikis. The discussion and history tab allowed example such as the one below to be identified:

kkt666: john write planet x is very likely to be a massive meteor and you would not be abel to live there
piplup1: Okay i will do it 2 day

The negotiation by two pupils of joint authorship resulted in modification of the Planet X page. The discussion tabs of all groups shows instances of collaboration, with pupils coming together to decide on the organisation of their report, canvas

Figure 1. Discussion between pupils showing using of informal ‘chatty’ writing in blue group. This image is reproduced with permission from the school and class teacher.
opinions, elicit advice, and invite joint authorship of a page. The example above highlights how the use of wikis in primary school can align learning and teaching practices with electronic literacy practices in the wider community. The reply by piplop1 and change to the Planet X page were made at home at 8.27 pm, and without any imposed requirement by teachers to complete the wiki as homework. There were several instances of discussions posted, and pages edited, by pupils at home that suggest positive engagement with this form of writing that exploits the benefits of computer-aided writing and places pupils’ activity within a joint enterprise where knowledge is understood to be created through interaction and sharing.

**Joint authorship**

All the wikis had examples of pupils editing the work of other children, but the extent pages were co-authored varied between groups. The history tabs enabled tracking of joint enterprise and the contribution of different pupils to pages in the wikis.

Table 1 shows the percentage of jointly authored pages as well as the numbers of discussion postings in each group. In blue group’s wiki, 89% of the pages were created through collaborative activity; this may correspond to the high level of interaction in the group’s discussion tab and indicate a high level of mutual engagement with the writing project. A straightforward relationship between high levels of interaction in the wikis’ discussion tab, and development of a shared repertoire of writing practices cannot, however, be readily identified. The association is not apparent in the silver wiki, the group with the second highest number of discussions, where only 50% of pages were worked on by more than one pupil. However, it should also be noted that, as Table 1 shows, blue group created 9 pages while silver group created 19, so the actual number of jointly authored pages in each of those groups was similar although the percentage was different.

The likelihood of a simple correlation between quantity of discussion and joint authorship of pages is further reduced by the fact that groups with low levels of discussion also displayed high instances of joint authorship through the recording of activity in the history tab. The factors affecting the degree of collaborative writing in this study remain obscure. They are possibly related to complex interpersonal issues, and the established beliefs and practices of participants that were beyond the capacity of this study to capture and analyse.

Instances of shared authorship included slight changes to the texts of others, which nonetheless provided valuable insights to the original author. One such example, shown in Figure 2, was in silver group where Cheekycegb changed an erroneous part of the report created by Laub.

However, collaboration on pages resulted in dramatic transformations as well as minor edits. This is well illustrated by blue group’s entry on ‘Earth’. This went through 10 iterations with contributions from each member of the group. The page started as a three-line list of facts, developed with the addition of an image, a title, the use of a question to engage the interest of readers and progressive organisation of information into paragraphs.

Co-authored pages tended, however, to have one dominant author. This pupil would generally have created the page and have taken responsibility for writing about that particular aspect of the solar system. Pupils editing the pages of other
children generally proceeded after an invitation from the original author or after negotiation. Uninvited requests to edit a page generally created resentment in the original authors. A vocal example of this response was observed in the class when changes were made to one pupil’s work without permission.

You typed over my Mercury Page. I’ve been doing it! He’s gone and wrote over it, God!

Pupils had a mutual understanding that arbitration was necessary to justifying editing of the original author’s words; interviews after this study revealed that pupils felt all types of amendment should receive this type of permission, whether for rewriting, changing the format of text, correcting spelling mistakes or altering the layout. This attitude towards pages was common to the entire class, and only the home pages seem to have achieved a shared status through their nomination for online interaction through the discussion tab; this neutral position may explain the fact that the home pages were all the result of activity by several group members. Requests to amend the work of others were made through the discussion tab and displayed an attempt to negotiate a working relationship by exploiting the benefits of familiarity.

micky4: i have done more now and i think we should change the front cover please could i do that thanks

However, the majority of approaches were made face-to-face. This preference may have been due to pupils’ relative unfamiliarity with computer-mediated communication or result from the physical proximity of pupils during most of their activity.

Pupils found combining their activity in shared writing a challenge. This was evident in the sensitivity to their own work being changed by others, and the difficulty they encountered negotiating joint authorship. This was very apparent in an interaction in silver wiki:

Sophdav: im doing it i hve lods and lods of info so ill delete urs ok yer ok yer.

Laub: whatever i did all the work
The inability of this pair to reach an agreement is unsurprising, as collaborative writing had not formed a part of school literacy practices which, as already noted, emphasise personal compositions. It also suggests that pupils’ partnership with others in the writing project did not submerge the personal ownership they felt over their writing. The wikis were produced by all, but a sense of individual ownership remained.

Use of images

The use of images was a significant aspect of pupils’ activity when creating the wikis. How images were inserted to a page was not modelled by teachers, but a technique was quickly discovered and disseminated by pupils. This highlights the value that children attached to adding pictures to their writing and also demonstrates that lengthy technical explanations are not always required for use of technology in learning. There are implications here too for the teaching of ICT skills; it may be that for learners only to know that it is possible and then, given sufficient confidence, they can discover the exact mechanism for themselves. The importance of using pictures was summarised with a straightforward explanation by one girl:

To show people what I’m talking about.

Pupils did not have any conception that the images might be subject to copyright. When one pupil was asked if it was acceptable for her to use a picture downloaded from a website, she replied:

Oh yeah, because it’s done by someone who works for the internet.

Children acknowledged that reusing copied text from an Internet source was wrong, but regarded taking images, or tables of information, as acceptable. A justification for this distinction was offered during the post-study interviews when one group explained that they could produce their own writing on the planets, but creating images was beyond their means. As copyright of images is an important issue, there is an implication here for ICT teaching: that image copyright needs to be taught explicitly and that learners also need to be taught how to find and use copyright-free images.

Conclusions

Pupils’ participation in the wiki placed them in a joint enterprise with others where they could contribute perspectives and realign interpretations through dialogue facilitated by the wiki. This activity built shared knowledge that would not have existed in the same form were it the result of one author. On the surface, therefore, wikis seem well placed to facilitate the new type of organisational model identified by Wenger and Snyder (2000). This conceives knowledge as most effectively shared through informal associations, which come together to participate in a joint enterprise and are capable of flexible and creative responses to problems. Snyder’s (2001) description of literacy practices and outcomes is recognisable in pupils’ shared enterprise of creating information texts in this study. Her view of literacy with ‘operational’ capability matched pupils developing an understanding of how to communicate information about the solar system, and how to operate the wiki. ‘Cultural’ competency was encompassed in the capacity to take an active part in the
group and achieve personal and shared objectives, while the ‘critical’ facility was the
ability of pupils to evaluate the outcomes they produced, the association in which
they had taken part and the appropriateness of the technology they used. The degree
to which children were able to meet the expectations of these dimensions encouraged
the belief that wikis have much to offer primary schools engage and develop pupils’
writing at upper key stage two, and respond to the changing demands for literacy
and technology described by Snyder and Bulfin (2008). The suitability of wikis is
further recommended by Leadbeater’s (2008) description as new kinds of
organisations that are without the hierarchy that generally characterises educational
and commercial institutions. The pupils felt ownership of their texts, but the group
wiki overall had no individual owner or designated leader.

Pupils affirmed their enjoyment of the project during interviews after this study
but voiced attitudes towards authorship that conflict with the shared approach to
knowledge building realised in large-scale wikis such as Wikipedia. This study
suggest that greater use of such technology for collaborative learning would require
primary pupils to develop maturity to take part in Web-based reciprocal interaction
of the type described by Byman, Järvelä, and Hakkinen (2005). On the other hand, it
may not be a matter of maturity, as Grant (2009) found that 13- to 14-year-old
learners were not comfortable with collaborative wiki-based writing, because it
conflicted with the accepted literacy practices of school and, most importantly, the
system of assessment. It would, therefore, also necessitate a shift in the education
and assessment systems’ conception of literacy to embrace the new digital forms and
practices noted by Kress (2003), Merchant (2003), and Lankshear and Knobel
(2006). Such a modification would have implications for the current primary
curriculum in English and ICT which mention that pupils’ writing should include
screen-based work and that pupils should work ‘with others to explore a variety of
information sources and ICT tools’ (QCDA n.d.) but do not mention the electronic
literacy practices such as wikis that are characteristic of the ‘Web 2.0’ user-created
Internet. It would also require an alternative pedagogy to the outcome-led lessons
observed by Hardman, Smith, and Wall (2003), which specify ‘correct’ outcomes as
the aim of learning. Part of this readjustment would see teachers adopt the type of
online facilitation skills and input to pupils’ writing activity that this study identified
but struggled to define.

Discussion through the wiki

Children’s use of informal chat in the discussion tab, but close observance of formal
conventions on the wiki page, shows how vernacular forms of expression can coexist
with the formal genres of the current curriculum. Burnett et al. (2006) believe
children develop and use ‘semi-private codes’ when using computer-mediated
communication, while Leu (1996) questions its role in education by ascribing its
popularity to a perception of ‘cool’ among young learners. The discrete use of such
codes by pupils in this study, however, suggested that their emergence does not
forecast the demise of grammatical and spelling orthodoxy among the young. The
discussion tab of the wiki showed how pupils’ use of chatty writing can promote
discourse and knowledge building. A distinction can be made between content-based
and process-based discussions: children using the wiki to talk about ideas, opinions
and expression or children using the wiki to talk about how they will organise the
work and about the technical/practical aspects of using the wiki. Investigating this
Developing a pedagogy of interaction

The role of a wiki to support a more pupil-centred approach to learning would require a development of the writing pedagogy that has been established in English primary schools since the introduction of the National Literacy Strategy (NLS). A new approach would explicitly acknowledge the social aspect of learning, a failing of the NLS noted by Joliffe (2004), and be accompanied by an assessment regime that considered pupils’ literacy across the full range of print and screen competencies. Use of wikis could help explore different approaches to learning by including the expertise and knowledge present in the wider community. The involvement of learned others, operating at the centre of pupils’ shared activity, would explicitly recognise the learning through participation in a community of practice described by Wenger (1998) and acknowledge the role of discussion identified by Laurillard (2002). Recognition of Laurillard’s conversational model of learning to an evolving pedagogy would incorporate the role of negotiation of views and modification of learner’s perceptions. These would imply greater freedom for teachers and pupils to define, and redefine, the goals (i.e. tasks) that constitute their writing activity. This study exhibited moments of such conciliation when pupils negotiated views on how to build the wikis, posting the facts they felt most pertinent and discussing the most appropriate structure for each page. Embracing these conceptions of learning to the literacy curriculum in primary schools could help refocus individualised activity and develop an authentic rational to write for an audience. However, the nature of interactions observed during this study suggests that pupils and teachers would require time to develop familiarity with this type of activity. This would involve a reappraisal of existing literacy practices, with an explicit appreciation of the role of talk in learning, so knowledge was understood to result for the modification and reflection resulting from such interactions.

Another way wikis could facilitate such interaction is in the ‘interactivity’ characteristic of modern literacy practice identified by Kress (2003). He recognises the ‘write back’ functionality, or bidirectionality in current literacy practices; that are a core feature of a wiki. Such bidirectionality when learning to write would allow pupils to change text in many ways, reuse and represent to various audiences, so diffusing the role of authorship. This feature of wikis has great potential to develop pupils’ writing in schools, placing children in the middle of a mature text, thereby providing a scaffold and a model of the grammatical structures and lexical characteristics of a particular genre. Writing back could also help create an expectation among pupils that they take part in the creation of texts, and awareness that their own compositions have the potential to grow without their continued participation when modified by others.

The history tab of a wiki is unique to this type of writing context, and, in this study, it placed pupils in a different relationship to writing than they usually occupy at school. A text was no longer a static object with an obscure origin. Pupils could view the development of pages over time and contribute to areas they felt needed improvement. Their writing was placed in a new position, as it was open to change and comment for someone other than the teacher. This repositioning of their compositions was an interesting feature of this study and suggested potential for
further investigation. It is also pedagogically significant, as it makes visible something which tends to be private and hidden: a writer's thinking as s/he develops ideas in the text. Soong, Mercer, and Er (2010) have shown how text-based CMC discussions can make students' scientific thinking visible in a way that can be used to develop teaching points and wiki-based writing has the same potential. Teachers can draw teaching points from the writing development shown in the wiki history.

**The role of the teacher**

Learning mediated through the wiki's discussion might have been more evident had this study provided greater feedback to pupils, and so modelled the role of talk in an online community. The role of the teacher as a learned other was not explored sufficiently in this study. This could have involved teachers actively participating with groups in the discussions and editing pages in the wikis. Greater participation could, in retrospect, have been beneficial in supporting pupils' writing and modelling the development of shared repertoire and joint enterprise that this study wished to foster. The reluctance to participate grew from concern that pupils' exploration and engagement would be inhibited by teacher who would focus on 'correct' written outcomes, rather than nurturing mutual engagement of pupils. Such fears seemed to have justification during this study, as teachers agreed that they had to battle ingrained tendencies to correct spellings and point out technical errors in pupils' writing. Emphasising the technical aspect of writing might have conflicted with the broader aim of promoting pupils to build perspective taking and a shared repertoire through online collaboration. The one instance when a teacher interacted with a pupil through the discussion tab was to provide technical support of the type decried by Honan (2008):

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Jobi: i wonder what happend to earth? do you know you know or can sort the page out and get the iformation back tell me please

Jobi: if you know

Teacher: Hi Jobi, looks like someone deleted the page by mistake. You can get back to earlier versions of a page using the history tab

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Classroom observation during this study demonstrated that a heavy focus on teaching technical skills to pupils may be misplaced. Children discovered a range of ICT techniques while writing their reports and shared these to develop and modify the competency of other pupils to use ICT resources. However, it is very likely that children would benefit from a greater understanding of the sociocultural aspects of technology-enhanced learning and writing. It was not easy, for example, for pupils to grasp the idea that a text may have more than one author, even though this is a common feature of 'real-world' writing. Children also need to learn how to learn though discussion (Mercer, Dawes, and Staarman 2009) and to learn that it is acceptable to share ICT techniques and skills.

**Resourcing**

An important prerequisite to their enthusiasm of the class during this study was the high level of ICT provision at the school than allowed for a pupil to computer ratio of 1:1. This proved to be an important condition to promote independence, participation and collaboration through the wiki. A lower ratio would have meant...
children shared computers and resulted in frustration at having to wait for access to keyboard and mouse. Although sharing computers might appear conducive to collaborative work, in practice one individual is likely to dominate the keyboard/mouse and the consequence for some pupils can be the type of disengagement and passivity observed in NLS lessons by Hardman, Smith, and Wall (2003) and Jolliffe (2004). The level of ICT resourcing made possible the kind of benefits promoted by Pittard, Bannister, and Dunn (2003) that associates good ICT provision with high levels of pupil motivation and raised levels of attainment.

The new dimensions to literacy practice described by Snyder are recognisable in some of the elements of this study. Snyder’s view of an ‘operational’ capability was pupils developing an understanding of how to communicate information about the solar system and how to operate the wiki. ‘Cultural’ competency was encompassed in the capacity to take an active part in the group and achieve personal and shared objectives, while the ‘critical’ facility was the ability of pupils to evaluate the outcomes they produced, the association in which they had taken part and the appropriateness of the technology they used. The degree to which children were able to meet the expectations of these dimensions encouraged the belief that wikis have much to offer primary schools engage and develop pupils’ writing at upper key stage two, as well as respond to increasing and changing demands for literacy and technology described by Snyder (2001).

Final remarks

In this study, children aged 9–10 worked in small groups using wikis to write reports about the solar system. The children were highly engaged with the wiki-based writing. Although an increase in motivation might be expected when children are working with a new and interesting tool, the teachers noticed that the quality and quantity of writing increased when children were working with the wikis. Furthermore, the interaction between pupils displayed encouraging instances of collaborative practice and sharing of perspectives to create shared knowledge, even though children were sometimes reluctant to edit the work of others. The children also showed understanding of the difference in genre between online discussion (in which abbreviations and ‘txt language’ are acceptable) and formal written texts.

The short duration of this study meant that there could be no transformation of the children’s writing practices. However, there was evidence of change in group process with pupils moving from the periphery to the centre of each small ‘community of practice’. This led to pupils being able to offer advice on content and asking to modify the work in contrast to the children’s initial response to the wiki-based writing which had involved importing their individualised practices from previous school experiences of writing. This suggests that successful collaborative wiki-based writing could provide a useful way of inducting children into a community of writers who can support each other. The wiki also provides audience for the children’s writing. Pupils’ writing in the wikis expected their writing to be seen by others as they watched each other’s work emerging and they knew that peers were monitoring progress. This is in contrast not only with the usual practices of writing in the primary school but also with ICT in which work is generally solitary, unseen and received comments only from the teacher.

Writing a successful wiki requires both pupils and teachers develop their writing practices. Teachers need to take an active role in the wiki, praising instances of
pupils’ co-authorship and exchanges of perspective through face-to-face comments or the discussion tab of the wiki. Teachers should also actively participate in the development of the wiki by making amendments and additions to the writing of the group. This shift from arbiter of a final piece to learned other supporting the process of writing may require a broadening of the scope of assessment. Teachers’ marking of writing might therefore need to evolve, as a collective form of assessment may be the most appropriate way to respond to a collaborative text. This would require an acceptance that twenty-first century literacy includes competencies in collaboration. Reconciling this with the need for personal feedback, particularly to the general concerns of spelling and grammatical accuracy, should form the basis of future research into school-based wiki writing.

Developing children’s writing in a wiki poses challenges, as the initial participation may be inhibited. Placing the collaboration among small groups of sympathetic peers, and in a familiar domain of knowledge, could help foster wiki practices, as could the explicit encouragement in the use of images. This is another instance where established models of assessment may need to be broadened to include recognition of skills in the taking and selecting of illustrative material used to scaffold the composition of a text.

Wikis also offer the possibility of greater flexibility in the timetabling of children’s writing. This has traditionally been based around a group or the whole class writing at the same time and in the same place. This is perhaps less relevant with a wiki that could be written at any time or place with an Internet connection. This freedom for children to plan the time and place of their writing enterprise more closely resembles the positive writing experience of diarist, poets and day-to-day authors who are free from a scheduled form of composition, and so able to write when ideas occur. It also offers the potential for inter-school projects when children from different backgrounds exchange ideas, information and experiences through wikis.

Further research is needed both with a larger sample and over a longer period of time in order to establish whether the apparent benefits of wiki-based writing shown by this study are both general and sustained. This study also showed that there are interesting questions about the role of the teacher in supporting and facilitating wiki-based writing which need to be investigated by further research. This would seek to develop an understanding of the role of a teacher in defining tasks, participating with pupils’ activity and building the extent to which children can effectively exchange perspectives and participate in a joint enterprise. It could explore how teachers might occupy a new virtual status that would allow them to relocate from the front of the class and place themselves among pupils’ activity as a particularly learned other in a ‘community of practice’.

The ways in which children conduct discussion in an about the wiki is also an interesting area for further research. This would require recording children’s in-person discussions, as they work on the project for comparison with their on-screen talk. This would enable researchers to consider how children talk about the processes and the content of their wiki-based writing.

Another potential area for research is the relationship between print and screen texts. Pupils in this study made use both forms, and the interrelation between screen and print will be an important consideration in the reappraisal of curriculum that currently is heavily biased towards paper-based forms of literacy. The crossover in design between print and screen, highlighted by Kress (2003), and the flexible way
people move between these forms suggest that a simple and static position would be unlikely, but the education system would benefit from a clearer understanding of the role both forms have in pupils’ learning to write and to manipulate text.

References


