Digital connections: transforming literacy in the primary school

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Much has been written about the transformative influence of new technology on the school curriculum, but only a small number of studies have focused on the practical implications for primary literacy. The dominant paradigm seems less concerned with transformation, instead favouring a view of ‘technology as enrichment’. This case study examines the possibilities of transformation through an electronically mediated partnership between two primary schools in the North of England. Children's digital texts are analysed alongside interview and observational data in order to document what transformation might look like in practice. The study illustrates how technology can be used to promote new literacy practices in the classroom, through the production of new kinds of texts. It also documents the emergence of peer-based learning relationships and changing perceptions of the teacher’s role.

Introduction

Currently, there are a number of distinct shifts in the use of technology outside the classroom (Lankshear & Knobel, 2003; Rheingold, 2003) as well as changes in the way children and young people interact with ICTs in their everyday lives (Livingstone & Bovill, 2001; Kaiser Family Foundation, 2003; Livingstone & Bober, 2004). Of particular interest is the rapid growth of different forms of e-communication, which have become a popular and powerful force in the lives of many, and young people in particular. The new literacies that are emerging in emailing, instant messaging, and through the use of SMS, chatspaces and message boards are examples of this (Herring, 2004). There is a pressing need for research that explores the educational implications of these forms of communication for classroom literacy, since they challenge the very definitions and contexts of literacy practice (Leu, 1996; Reinking, 1997) and involve children and young people in new ways of taking and making meaning.
Despite creative and innovative uses of new technology outside the classroom, many teachers struggle with the practicalities of integrating ICT into the curriculum. Very real concerns about classroom organization such as the use of space, access to equipment, and pupil grouping are significant challenges (Holloway & Valentine, 2003). Put together with constraints on curriculum planning, and the competing demands of administration and accountability, the technologized curriculum begins to sound like an innovation that is bound to fail, even before any considerations about professional confidence and the reliability of hardware are made.

Two contrasting paradigms characterize current curriculum policy in the UK with respect to new technology. The ‘blue sky thinking’ of the Government’s e-learning strategy envisions a future in which teaching and learning are transformed, schools become new sorts of learning environments, and curriculum objectives change (DfES, 2004). At the same time, the work of the Primary National Strategy and the Key Stage 3 Strategy adopts an ‘enrichment’ view of new technology, in which Smart Boards replace blackboards and web sites replace worksheets. These two paradigms dominate the educational landscape: the one based on the idea that new technology will ‘transform’ pedagogy (some time in the future) and the other based on the assumption that it can ‘enrich’ what is already taking place.

The problem with transformation is that it always seems out of reach, conceptually far removed from the everyday classroom realities of forming relationships with pupils, organizing learning and teaching, managing behaviour and so on. Whilst waiting for the bright new future, teachers have to get on with coping with the present, with all the rewards and frustrations that involves. And so, in the continually reforming world of education, enrichment may be a more attractive option. With this model there is no need for major change and little disruption, just some new equipment and the appropriate retraining. Broadly speaking this has been the model adopted in the UK by the National Grid for Learning (NGfL, 2004). Of course, the problem with this approach, as Lankshear and Knobel (2003) point out, is that it fails to come to grips with new possibilities, and the changes in the form and function of literacy that characterize e-communication. As a result it is unlikely to equip pupils with the sorts of practices and critical perspectives that will equip them for the future at the same time as failing to engage them in the present.

Across the compulsory sector in the UK, response to the ICT agenda is patchy (Facer et al., 2003). Some colleagues, often for good reasons, avoid technology as much as possible; others rely on decontextualized, skills-based development of ICT skills. It is perhaps not surprising then, that classroom-based studies that explore the impact of new technology on literacy provision are few and far between (Andrews, 2004). Approaches that are workable, but at the same time win the hearts and minds of hardworking colleagues, are badly needed. Our work attempts to show how digital writing and e-communication can transform classrooms by rooting development in the practice and experience of professionals. We aim to create a synthesis of real world uses of communication technology and the curricular aspirations of classroom teachers and this informs the work reported in this paper. This involves an
acknowledgement of the affordances of screen-based texts (Kress, 2003) and a foregrounding of purposeful (or authentic) communication. Whilst with Tyner we acknowledge that ‘There is little consensus about how technology is best infused into learning environments’ (Tyner, 2003, p. 379), we show how digital writing can ‘make sense’ in the primary classroom. So, in the work described here, email is used to ‘get things done’ and presentational software to demonstrate what has been achieved. It is transformational in that it provides contexts and forms of collaboration that extend beyond the classroom, and kinds of literacy that move beyond those currently on offer in the National Literacy Strategy. In so doing, it builds on the earlier studies of Merchant (2003) and Burnett et al. (2004), and focuses specifically on children’s explorations of new literacy and the characteristics of the texts they produce.

E-communication in classroom contexts

Work in this field is by no means new, and previous studies of young children’s use of e-communication in classroom contexts have contributed to a growing understanding of its uses. Here we review some of the more influential work. In a recent study, Harris and Kington (2004) report on a case study of 10-year-olds in email contact with employees at a mobile phone factory some 30 miles away from the school. ‘Epals’ learnt about children’s interests and in turn offered insights into the world of work. Teachers involved in the project commented on how they found out more about their pupils when reading the messages they exchanged. A more formal evaluation showed gains in pupil motivation and social skills.

McKeon’s (1999) study of 23 children’s email interactions with pre-service teachers looked at the balance between purely social exchanges and topic-focused exchanges (in this case book-talk). Roughly half of the exchanges of these 9- and 10-year-olds fell into each category, leading McKeon to conclude that ‘classroom email partnerships may provide students with a new way to learn about themselves as they select information that defines who they are and send it via email to another’ (McKeon, 1999, p. 703). From this it seems that e-communication can provide useful opportunities for exploring identity and relationships whilst providing a discursive form which depends on purposeful communication with audiences beyond the confines of the classroom.

Others have expressed concerns about the use of e-communication in educational settings, suggesting that a medium that clearly works well for informal social interaction may not necessarily be an effective tool for learning. For example, Leu (1996) suggests that e-communication needs to do more than appeal to youngsters just because it is ‘cool’. In a close analysis of the frequency and content of email exchanges between 301 11-year-olds, Van der Meij and Boersma (2002) draw attention to the social nature of this communication. However, their work appears to be predicated on professional concerns that frivolous social interaction could undermine learning exchanges related to a technology project. Nevertheless, this work emphasizes the importance of using email as a communicative tool rather than
a focus in itself (as is sometimes the case in skills-based ICT instruction). The researchers draw attention to the need for more work in this area, observing in passing that ‘email is not yet the integrated communication tool that it is in business settings’ (Van der Meij & Boersma, 2002, p.199). In short, the ubiquity of interactive written discourse in work and leisure—and even in some educational settings—finds few parallels in most primary classrooms.

There is less work on the processes of digital writing. Matthewman et al. (2002) report on children’s use of visual features in onscreen writing. Their study suggests that visual elements (such as font size and colour, layout and use of image) may be significant at all stages of composition. Similar findings are reported by Merchant (2004a) whose analysis of children’s onscreen work focuses on the production of multimodal texts. This ongoing attention to the visual appearance of texts at all stages in its development contrasts with traditional models of writing which associate presentational features with the production of a final draft.

These studies show some of the characteristics of children’s digital writing and their use of e-communication and suggest some important lines of enquiry. A transformative approach would need to be both sensitive to these, as well as the literacy capital of the pupils themselves (Bearne, 2003). Importantly, previous analyses of children’s onscreen writing have provided evidence of children’s expertise, willingness to learn from each other and to solve problems through creative play (Merchant, 2003; Burnett et al., 2004). The work reported on here builds on this knowledge, moving beyond the confines of the enrichment model, to explore how e-communication can create new contexts for learning, producing new kinds of texts for new audiences.

Here, we present a preliminary analysis of data gathered from a school-based project initiated by the researchers that illustrates ways in which teachers of 8- to 10-year-olds have set out to provide opportunities for pupils to explore e-communication in ways that are meaningful to them. In particular, this research asks the following questions:

- How can the use of peer-to-peer digital communication transform classroom practice?
- What processes characterize children’s onscreen communication?
- How do children use the affordances of digital media in peer-to-peer communication?
- What are children’s views about the use of digital communication in the classroom?

The project

The project involved pupils from two very different primary schools emailing each other as a preparation for producing a joint PowerPoint presentation on children’s views and interests to a group of trainee teachers. Pupils from a mixed Year 3 and Year 4 class in a rural school in Derbyshire were twinned with Year 5 pupils
attending an urban school in Sheffield. The schools were selected for practical reasons—the teachers were self-selected. Management was supportive in both schools and written permission was given by the parents (or guardians) of the pupils involved. Although the focus was on pupils’ use of digital literacy, there was a strong feeling from the class teachers that the social benefits in terms of breaking down stereotypes and widening horizons were likely to be positive by-products of the project.

In order to facilitate an initial exploration of children’s views and interests, pupils in both classes were provided with a shoebox to collect artifacts that were of significance to them (Johnson et al., 2002). Six pupils (three girls and three boys) were then randomly selected from each school and partnered with a child of the same gender in the other school. These children then used email to get to know their partners, attaching digital photographs of items from their shoebox as a starting point for their interaction. This use of image acted as a prompt for the receiver who responded by asking questions to find out more about the items and their significance. Children were given individual email accounts and required to use an onscreen alias.

Both schools involved all of the children in each class in the early stages of the project, using the shoeboxes as the catalyst for speaking and listening activities. Pupils were organized into groups to support the child who had been selected to be involved in the project. In the urban school, email communication took place during a timetabled session in the ICT suite; whereas pupils in the rural school had more flexible access with wireless laptops. The groups of pupils met face-to-face on two occasions prior to producing their final PowerPoint presentation. The first meeting involved pupils in discussing ideas and structure for their presentation, whilst the second focused on producing first drafts of the PowerPoint slides. This second meeting was followed by email communication as draft presentations were edited. The final stage was a joint presentation at Sheffield Hallam University to trainee teachers. Partners from the two schools took turns in presenting the PowerPoint slides.

Methods

Capturing the range of activity that was involved in this work raised a number of methodological issues. The research team was more interested in how children used digital literacy than evaluating the effectiveness of this particular project. As a result, the focus of our attention remained on the children themselves, the texts they produced and what they had to say about their own work on screen. But schools and classrooms are complex environments and, as we know, their organizational ecology influences how new technology is used (Holloway & Valentine, 2003). To focus on the children’s digital literacy meant that important contextual factors, such as the role of the teacher, access to networked computers and support mechanisms were not considered. Instead we chose to gather rich descriptive data on writing processes and products.
Research on digital writing is in its infancy and despite the suggestion that new approaches are needed (Nixon, 2003; Lankshear & Knobel, 2003) there is little work to draw on. We decide to employ a multi-method approach. Firstly, this involved the collection of samples of pupils’ writing at different stages of the project. The majority of these samples were interactive emails with attached images and PowerPoint slides. These were archived in the email system to which the research team had rights of access. 120 emails were exchanged during the course of the project. They provided a corpus of digital writing that could then be subjected to analysis.

Secondly, in order to learn more about the onscreen writing process, members of the research team acted as non-participant observers when children were involved in project work. We designed and piloted an observation schedule (Appendix 1) that was used to record onscreen activity, pupils’ physical actions and any accompanying talk. Pupils were observed in both participating schools during their email writing time. These observations focused on one child at a time during a five-minute time slot. It was agreed that these observations would take place during the compositional stage of email writing.

Thirdly, to probe the pupils’ perceptions of digital writing, we conducted a series of semi-structured interviews at various points during the project. Pupils were interviewed in a small group in the classroom in order to minimize any feelings of discomfort. We felt that this would provide a context in which they would be more likely to speak in depth about their experiences. Interviews undertaken at the early stages of the project aimed at eliciting pupils’ prior knowledge and experience of digital communication, and their feelings about e-communication in the context of the project. They also offered the researchers an opportunity to talk about specific issues that emerged from the observation data (such as changes made to texts and the choice of attachments). The interviews were semi-structured, including core questions designed to explore pupils’ prior use and experience of digital communication (email, text or chat), and what they thought about the emails they had written that day.

Given the richness and complexity of the qualitative data collected, analysis was conducted at two stages by two separate teams of researchers using inductive coding strategies (Strauss, 1987). The first stage consisted of an initial reading of the data. This was followed by the development of a coding frame that was used to identify emerging themes. This process was then repeated by the second team as a consistency check (Miles & Huberman, 1994). The final categories were agreed by both teams at which point overlap and redundancy was reduced.

**Findings**

In presenting our findings we look at three categories that emerge from the data. The first of these is concerned with the writing process and deals with children’s interactions with the technology (and in particular the keyboard), the relationship between composition and transcription, and the ways in which pupils worked together on text creation. The second is concerned with the particular features of the
texts they created and focuses on both verbal and visual elements of this work. Finally we explore the pupils’ perceptions of digital texts and their place in the school curriculum.

*Transforming the way we write: the writing process*

‘Writing with a pen is a bit annoying but with a keyboard they’re already there so you don’t need to do it’ [referring to the letters of the alphabet] (Arwen).

Compared to traditional classroom writing practices that use paper-based media, writing onscreen requires a whole new set of skills that involve the body in new ways (Merchant, 2004b). Most screen-based writing uses a keyboard and pointing device (such as a mouse); usually the alphabet is beneath the writer’s hands, and the text is displayed on a vertical screen in front of the writer. These obvious differences in materiality are easily overlooked, but can pose a challenge for young writers. Although pupils may have had plenty of prior experience of working with new media, we cannot assume that basic keyboard operations and mouse skills are automatically understood or that competence is equally distributed. Children’s varied levels of keyboard confidence become significant when aspects of classroom work are dependent on e-communication.

Some project children became frustrated because of their lack of typing experience, as the following interview illustrates:

**Interviewer:** Did you enjoy sending emails?
**Boudicca Battleaxe:** Not really.
**Interviewer:** Why not?
**Boudicca Battleaxe:** Typing—it took ages. … I had to go like this [mimes searching for keys] to find the …

**Heartbreak Kid:** Yeah—I’m like where is it? It takes me like one hour to do one sentence.

However, not all children responded in the same way to the labour of typing, and indeed our observational data suggest a wide range of keyboarding skills even within this relatively small group of pupils. Observations highlighted a number of different kinds of keyboard behaviour and pupils deployed a range of hand and finger movements in typing including ‘hovering’ with fingers splayed over the keyboard, ‘fluttering’ with fingers above the keyboard and ‘pecking’ with a single finger. Others used two hands and were more or less able to touch type. When we observed less fluent keyboarding it was sometimes hard to tell whether pupils were thinking what to write next or searching for a particular letter key.

We were surprised to find that some email messages, which gave the impression of being rapidly written on account of their structural simplicity and informal register, had actually been painstakingly produced by the young writers. For example the line in an email ‘My dad was a footy player’ took four minutes in its creation—and this was not untypical. Less confident writers were sometimes obliged to ask their classmates where to find a particular letter on the keyboard or how to start a new line. Some children struggled with the QWERTY keyboard. Arwen, in interview, seems to suggest that an alternative layout would be helpful: ‘If I had an alphabet
keyboard it would make it even easier cos’ I couldn’t find the right letters on the keyboard’. Presumably by ‘alphabet keyboard’ she is imagining an array in which keys are laid out in alphabetical order. A similar example comes from Corky, talking with Half-Life about what they learnt during the project: ‘I know where the keys are now. I used to be like that [mimes typing slowly] ‘Where’s H? Where’s H? It was really hard to find’.

However, other children drew on a wider experience of typing and did not find this aspect of e-communication quite so challenging. Again, we were struck by the uneven distribution of these sorts of skills.

Onscreen writing raises important issues about the relationship between composition and transcription in children’s writing. The physical demands of pencil control and letter formation become redundant in this environment—letters are more or less perfectly formed onscreen—whereas the actions of letter selection, key and mouse operation make other kinds of demands on young writers. Some of the children in this study, who were less familiar with the keyboard and more practiced with pencil and paper, referred to the physical demands of the keyboard typing (aching hands) as well as frustration with their typing speed.

Observations of email writing showed that correcting and editing often occurred alongside composition, usually on a word-by-word basis. Examples are shown below. In Table 1, Heartbreak Kid shows word-by-word writing, accompanied by an ongoing revision of surface features. There are also regular checks for sense, through rereading and indeed this was a common feature of children’s email writing. Some children would also track their rereading with mouse-controlled cursor movements, as if poised to make minor changes or corrections.

Table 2 is an extract from an observation of Football Crazy who is writing to One Ring. Football Crazy is more competent as a typist and, although there are errors, he writes more onscreen (often several words) before rereading and checking for errors. There is also clear evidence of using the mouse for navigation and standard functions for capitalization. Nevertheless the speed of writing is quite slow and takes approximately 15 minutes to complete.

Table 1. Heartbreak Kid onscreen

<table>
<thead>
<tr>
<th>Time</th>
<th>Onscreen</th>
<th>Physical action</th>
<th>Talk (s=Self/o=other)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.05</td>
<td>Hi, me ag</td>
<td>Runs fingers over keys, writes ‘Hi’</td>
<td></td>
</tr>
<tr>
<td></td>
<td>... again</td>
<td>looks up at screen; writes ‘me’ looks up at screen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HK</td>
<td>Looks up at screen</td>
<td></td>
</tr>
<tr>
<td>11.06</td>
<td>e/changes to E</td>
<td>Sighs, looks up at screen; searches for letter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>caps lock</td>
<td>Scans keys searching for letter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E all</td>
<td>Looks up</td>
<td></td>
</tr>
<tr>
<td>11.08</td>
<td>E mail</td>
<td>Sighs, nods head from side to side with each word</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reads message (s)</td>
<td></td>
</tr>
</tbody>
</table>
The Football Crazy excerpt shows the blurring of boundaries between what we might describe as the purely physical (searching for letters, pressing keys and clicking the mouse) and the technical (using the cursor, deleting and inserting and changing the appearance of words onscreen). The constant interplay between writing and reading is interesting here and suggests that the physical separation of the text from the writer may actually encourage children to edit or revise their work. Certainly this observation shows how some young writers pay close attention to accuracy of spelling and layout when working onscreen.

Knowledge of a more technical nature that concerned specific operations within a programme was also quite freely shared. We commonly observed children ask ‘How did you do that?’ questions which often led to informal peer-tutoring on things like changing font-size, and copying chunks of text. For example, in the following sequence, two children are working together to produce a PowerPoint slide on dinosaurs.

Half-Life points to the screen and says ‘Where did you get that from?’. Corky doesn’t reply and keeps control of the mouse, copying the picture from a webpage and says ‘It cloned it’. Corky right clicks and pastes the dinosaur onto the slide. Corky says ‘I want a murky colour’. Half-Life leans across and takes control of the mouse to change the background colour.

This highlights how new technology can help to establish more varied collaborative relationships within the classroom, when learners recognize that skills and knowledge are distributed and that their teacher may not necessarily be the expert. Our observations suggest that teachers, for their part, are very aware of how using technology can disrupt established patterns of classroom interaction. Perhaps learning to admit that one doesn’t always know how to do things is an early acknowledgement of transformation.

Transforming what we write—new kinds of text

Previous studies of children’s email correspondence have shown how they appropriate the language features of popular communication found in the
text-messaging and digital writing of teenagers and young people (Merchant, 2003). In this study we found a number of examples of this. Experimentation with repeating letters was common and included both letter patterning and reduplication (see Table 3 for examples). Abbreviation was regularly used, and ‘conversational’ exchanges which employed both stylistic and orthographic innovation were noted (Figure 3).

The children’s use of abbreviation was particularly interesting. Nearly all of the writers used ‘u’ for ‘you’. In an early exchange, as we have seen, one of the children showed audience sensitivity in providing the parenthetic gloss ‘(u means you)’. On another occasion a wrestling enthusiast referred to WWE (Worldwide Wrestling Entertainment) in an email and this led to some confusion. Here, two children in the project reflect on this and on abbreviation in general.

Heartbreak Kid: I was writing to someone I thought would know all the things but then he didn’t know what WWE was and I nearly walked myself straight into a wall when he didn’t know … were you able to know what it said?

Boudicca Battleaxe: … well I thought it meant world-wide education …

Heartbreak Kid: When I might HBK did you know what I meant?

Boudicca Battleaxe: … sort of …

Heartbreak Kid: … cos’ it means Heartbreak Kid like what I am.

Abbreviation also became a topic in one of the email exchanges, showing how children at relatively early stages in their writing development are aware of the language features associated with popular electronic communication. Here Ivy writes to Pixie about text messaging:

Pixie,

I don’t txt but I understand how the type of writing txt is wrote

Herring (2004), in commenting on linguistic innovation in popular communication argues that the development of semi-private codes is nothing new, yet this, and other examples (Burnett et al., 2004) which show younger children’s experimentation, suggest that these codes are not necessarily private. In fact their use is widespread crossing social and cultural groups, age ranges and geographical regions.

In working towards the final product of PowerPoint slides, the children were more overtly engaged in creating multimodal texts. They used a variety of visual elements including their own drawings and digital photographs, photographs and images from the internet, cartoons and clipart.
Heartbreak Kid: I got them [pictures] from the Internet … that from clipart … that from clipart …
Boudicca Battleaxe: … that’s from the camera …
Heartbreak Kid: … and I drew that.

This sensitivity to the affordances of the medium enabled them to experiment with design skills which incorporated the visual and the verbal, movement and on some occasions, sound too.

The creation of the slides involved the children in negotiation and experimentation as they conducted a range of technical operations. These included resizing elements so as to incorporate multiple images on a single slide, changing font and background colour and applying animation. At this stage, more attention was paid to the visual elements; relatively few changes were made to the written text. Figures 1 and 2 show the initial and final stages of the ‘making stuff is cool’ slide sequence, a collaboration between Boudicca Battleaxe and Heartbreak Kid.

Watching children developing these presentations, we were particularly interested in the ways in which children went about selecting images and then giving them new meaning. A dynamic process of composition seemed to emerge. Sometimes image selection seemed almost haphazard, constrained only by a broad sense of topic. Here Boudicca Battleaxe and Heartbreak Kid describe the process:
Heartbreak Kid: I got my mind off wrestling for once …
Boudicca Battleaxe: … and went into the art of Picasso … [laughing].
Heartbreak Kid: I just tried to find things out about wrestling(!)—I mean drawing and I found a crayon and some drawing with its eyeball out.
Boudicca Battleaxe: … and like that one as well, cos’ they had asked the question ‘What is bionicle?’ and I answered it.

But, once images had been selected, children tended to develop their significance by adding movement or sound. This was often prompted by characteristics of the image itself. In this instance, design vectors (Kress & Leeuwen, 1996) were important:

Heartbreak Kid: … he had to move
Boudicca Battleaxe: … it looks like he’s walking … so I walked in with a laser shot [referring to an animation command].

On other occasions movement was prompted by conceptual concerns. The lego brick was given a descending trajectory because ‘it’s like someone actually putting the bricks on’. In producing the slides the children solved problems as they occurred and developed the confidence to understand that sometimes you have to retrace your footsteps. This attitude is illustrated below.
Boudicca Battleaxe: I had a problem with that one. … I wrote something on and then
I put the background in and then covered up the writing. And
then when I wrote on it the background disappeared.

Interviewer: So what did you do?
Boudicca Battleaxe: I had to go to the Internet and get the same background again.

Children’s perceptions of digital texts

The work of Kress (2003) has been influential in drawing attention to the visual
nature of screen-based texts. Although initial communication in this study was
transacted through the verbal medium of email exchange, the children did appear to
be sensitive to the visual aspect of their words onscreen, as well as to the added
communicative potential of visual images. When working in PowerPoint they
seemed to be almost intuitive in their sensitivity to the multi-modal. Here Corky and
Half-Life reflect on their use of background colour:

Interviewer: Was it important to have background colours?
Corky: It looks boring with all the same colour …
Half-Life: ... and it looks more colourful with different backgrounds.
Interviewer: How did you go about choosing the backgrounds?
Half-Life: I think when we did the PowerPoint we clicked the right button and then went on background and you gotta click on this arrow and then choose colours that are pre-set ... and I chose something that was there ...
Corky: It's not just like green ... black ... orange ... you can all the colours ... you can have all the colours.

So, Corky and Half-Life articulate their sense of what makes a visual display interesting as well as describing what they have learnt about using the PowerPoint palette to individualize their background.

Email communication was often accompanied by picture files with written messages commenting on aspects of the attached image. Children were aware that their readers would see both texts, reading them in relation to each other or even as a unified multimodal text. An example of this is shown in Figure 3, a attached digital photograph of a soft toy attached to a message which contains the question: ‘Are you into furry stuff?’ Here the image gains extra meaning from the verbal message, whereas the verbal message is also dependent on the visual message for interpretation.

Although, as we saw earlier, some children talked about the difficulties of typing and particularly letter location, there was evidence to suggest that they found visual appearance of verbal texts satisfying.

Izzy: ... all you have to do is just press a button and it comes up ...
Twinkletoes: and also it’s neater ...
Izzy: You don’t have to worry about your handwriting ...
Twinkletoes: If you get a word wrong then a wavy line comes up ...

Observations and email data show that children expend considerable effort and time on the appearance of written text. So for example, the p.s. in Arwen’s message (shown in Appendix 2) illustrates that she has considered how the recipient of her message can scroll down the text to reveal further messages. This is one of many examples that show how children personalize the essentially featureless space of an email template.

Prior experience of email was mentioned by some but by no means all of the children in the study. The most commonly mentioned uses of email were to communicate with family members. Half-Life described how he had ‘emailed some people ... I’ve emailed my uncle in Pakistan’, whereas the following discussion between Izzy and Twinkletoes suggests how some children may be apprenticed to e-communication in the home:

Twinkletoes: I send emails to my great auntie ...
Izzy: I do it with my Dad ... sometimes email my friends ... sometimes help my dad do it.

In interview, children referred to the ‘private’ or interpersonal nature of email communication, referring to it as ‘quick’, or ‘chatty’. From the email archive and observational data it was clear that a number of children were familiar with emerging textual conventions of interactive written discourse such as the use of ‘u’,
reduplication and capitalization. This was seen as something you couldn’t do in formal literacy lessons—‘you’d get told off’.

Despite the children’s general awareness of the communicative uses of both email and PowerPoint, neither medium was considered by them as ‘literacy’. This is not surprising, since children’s perceptions of subjects are likely to be strongly influenced by their school experiences, and these in turn are constrained by current curriculum guidance. So, despite attempts to introduce ICT into the literacy curriculum (DfES, 2000) the fact remains that only a handful of Framework Objectives (DfEE, 1998) refer to e-communication. This helps to explain why projects, such as the one described here, often have to fight for curriculum time and recognition.

Children’s perceptions varied from seeing the work as related to some other aspect of the curriculum (for example: ‘Geography because of emailing somebody from a far distance and finding out’ or ‘Maths because you had to work things out’) to activity that was not even ‘work’. So, for instance one child described intensive group work on the collaborative preparation of PowerPoint slides as ‘the day we did no work at all, we were just emailing’.

If nothing else, children reported that as a result of working on the project they became more confident with new technology and learned ‘how to use the computer better’ and claimed that they could now type faster. Their skills improved through contextualised use in which the production of texts had a clear purpose for communication and a responsive audience.

**Discussion**

With collaborating primary school teachers, we designed a project that would enable us to explore some of the ways in which new technology might transform literacy practices in the classroom. Our analysis shows how technology can both transform the way children write as well as the kinds of texts they produce. We suggest that several areas are in urgent need of further investigation. These include: the physical demands of onscreen writing, the writing process in relation to the production of digital texts, and the combination of verbal and visual material in onscreen writing. We have argued that there is a pressing need to incorporate new literacies into classroom life and that this involves changing views of text production and consumption and, in fact, the very nature of literacy.

The project and the data presented here offer some ways of looking at the embedded use of new communication in the primary classroom. The work suggests that email partnerships are worthwhile because they provide experience of an important medium of asynchronous communication. Using email not only encourages children to communicate, by providing an authentic and responsive audience, but also actively engages them in the use and exploration of a mode of communication in which focused exchanges of information, playfulness and experimentation are essential features. In this context, motivated by a meaningful purpose for communication but freed from the constraints of conventional
classroom literacy practices, they demonstrate a high level of motivation in exploring
the potential of the medium and developing their skills and language use.

The children in this study responded with keen interest to the challenge of
working onscreen, demonstrating a willingness to experiment and learn, as well as a
fairly sophisticated awareness of the ways in which meaning can be created with
interactive multimodal texts. They were clearly able to make sense of and use a wide
range of texts and quickly became confident in their ability to create meaning in
different ways. As mentioned earlier, such skills and understanding are largely
overlooked by current policy and practice in the teaching of literacy, which tends to
confine the role of ICT to that of a typewriter or tool for consolidating traditional
literacy skills (Andrews, 2004). In contrast, this study serves to illustrate the benefits
of rethinking literacy in ways that accommodate the new ways in which meaning is
created and understood.

However, the potential for ICT to contribute to the transformation of the literacy
curriculum extends beyond this redefinition of literacy to include the nature of
teaching and learning involved. In this study, new technology not only provided new
purposes and audiences for children’s communication and new forms of text to
produce, but also offered new environments for learning and opportunities for
cooperation in the development of skills and understanding. It presented
opportunities for learners and teachers to be placed in different positions and
relationships to one another, dissolving the walls of the classroom.

Whilst this study has highlighted the potential for ICT to transform the
curriculum, it has also illustrated a significant hurdle to such change. Our data
illustrate the varying levels of confidence demonstrated by children in writing
onscreen. So, for example, their actions in typing clearly reflected a wide distribution
of skills. Such variation in confidence and competence would appear to suggest that
the children were drawing on differing experiences of ICT from outside school.
Although there is insufficient evidence in this study, it seems likely that this sort of
‘digital divide’ is not simply about access at home (Facer et al., 2003) or
affordability, but about compatibility of experience (Tyner, 2003). What is clear
from this study is that typing, onscreen navigation and the use of pointing devices are
essential skills for young writers if they are to capitalize on the possibilities of digital
literacy. Ensuring that all children acquire such basic skills is therefore essential if
none are to be excluded from the new opportunities offered by changes in the
technology of writing.

Conversely, this study has also highlighted the ability of children to draw on their
experiences of out-of-school literacy. Bearne (2004) has pointed out that in the
classrooms of the future children are likely to be drawing on new forms of literacy
capital. This experience again has implications for classroom teaching. Hull and
Schultz (2001) have been influential in drawing our attention to the importance of
out-of-school experiences in literacy—clearly this vision must now encompass digital
literacy.

In conclusion, this project did not only encourage the development of ICT skills in
a meaningful context. It also provided the children with the opportunity to step
outside the confines of the formal school curriculum. In its use of new technology to offer children opportunities to explore broader notions of literacy, new kinds of relationships and new forms of communication and learning, our work begins to suggest possible avenues towards what may sometimes seem an unrealisable goal of transformation of the curriculum.

References


### Appendix 1. Observation schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Onscreen</th>
<th>Physical movement</th>
<th>Talk (s=Self/o=Other)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.06</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11.08</td>
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<td></td>
<td></td>
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</tbody>
</table>

### Appendix 2. An early question and answer email

Alex Jordan writes:

> Hi we like dogs best
> we are year four and three
> what is your year?
> what is your fav breed of dog?
> what is your fav colour of dog?
> do you like carrots?
> hi Alex
> were y5
> A labredoor
> goldy yellow
> Do I ever yer!!!!!!!!!!!!!!!!!!!!!!!
> Your pale Arwen
> p.s please reaply to my? (this means queatoins)
> do u like fairy tales?
> are u into furry suff?
> Do u know when were comming to yours?
> Sorry i didn’t get to finish my letter
> did u ake a box?
> BBBB BBBBBBBBBBBBBBBBye Arwen
> >
> >
> >
> >
> >
> >
> >
> >
> >
> >
> do u like gravy?
> hi.
> d
> do you like bananas
> see you next week
> bye for now alex
> xxxxxx