Reshaping Learning

New Technologies and Multimodality

Carey Jewitt

Edited by Mary Kalantzis and Bill Cope

International Journal of Learning
Volume 10, 2003

Reshaping Learning

New Technologies and Multimodality

Carey Jewitt

Introduction

Decisions about how school knowledge is represented and communicated matter. They matter because, as I hope to show in this paper, there is a fundamental connection between modes of representation and communication, technology and the construction of curriculum knowledge. This is hardly a new idea. Yet the changes in the representational and communicational forms (and facilities) made possible by new technologies are often considered superficial, even irrelevant, to teaching and learning. The aim of this paper is to show that representational and communicational modes and media are central to a more profound understanding of the relationship between technology, knowledge and learning.

In order to do this I explore what the 'multimodal explosion' of colour, image, animation, sound-effect and so on can mean for the representation and communication of school curriculum knowledge and practices. The centrality of language in learning is, I suggest, changing; often writing is either barely present on screen or its visual character of is foregrounded, emphasised to the near obliteration of its linguistic meaning. The complex configuration of image, animation, word and other modes on screen, that is the designed relations between modes, and the structures and links that connect them also contribute to meaning. All of which leads to the question of what kinds of imaginative and interpretative work is demanded of the 'reader' of these multimodal texts and what might all of this mean for learning, and literacy.

The Multimodal 'Explosion' of Resources on Screen

Technology, 'old' or 'new' always shape knowledge in specific ways and when technologies change we need to understand what it is that is being reshaped. The 'new' is however always connected to what has gone before and always impacts on, slips over into the 'old'. In the case of educational resources, for instance, the design of the screen continues to impact on the design of the page, and vice versa. Nonetheless, the affordances of new technologies and screen as opposed to the page make available and configure a range of multimodal resources differently, and these differences offer the potential to shape curriculum entities in distinct ways that are significant for learning.

The affordances and facilities of new technologies make a range of representational and communicational modes available to teachers and students in the classroom, image, movement, music, writing and so on. The affordances and constraints of these representational modes differ; these differences are the result of the complex interplay of the materiality of modes and their social usage over

time. The representational potentials of image enable particular aspects of curriculum concepts to be actualised, aspects that may not be possible or easy to represent in writing and vice versa. As a result of these affordances the representation of curriculum entities is realised differently in different modes. To say something-in speech or writing, is not the same as to show something-in a diagram or image. In the configuration of modes on screen (as in other sites of display) the affordances of modes contribute to the realisation of entities differently and take on specialised functions in different subject areas. Further, people's use of modes in specific contexts (including for example the cultural and historical use of image in Science as opposed to English) has led to particular modes, or modal resources being associated with particular communities and practices more readily than others.

In school science textbooks the curriculum concepts of particles and states of matter, for example, are usually represented by images and writing. In a popular CD-ROM used in British schools, *Multimedia Science School* (New Media Press, 2003), the move to the screen the representation of such concepts is changed by the potential to show the particles moving, and the facilities of the computer, especially the potential for student interactivity.

The representation of particles moving changes the work of the teacher: without new technology, the teacher has to enliven the images and models through gesture, which raises difficulties of agency and realism. The representation of the movement of the particles on screen also enables the transformation from one state of matter to another, for example a solid to a liquid, to be shown. This representation serves to shift the curriculum focus from the discreet states of matter (solid, liquid, and gas) of the static image to a focus on the transformation between states of matter.

Through the configuration of modes on screen each mode comes to realise specific and different aspects of the curriculum entity being constructed. In the case of the Science CD-ROM discussed here, writing is used to name 'the scientific', with labels such as 'liquid' or 'solid' being the only writing on the screen. Image is used to represent the 'empirical world', for example, the ice cube in a beaker on top of a tripod (also a visual connection with the work of students in the traditional observation of the science classroom, visually embedding the new in the old). Movement is used to represent the behaviour of the entity particle in the different states of matter, its movement, speed, and direction. Each mode 'fills-in' the concept particles in different ways.

The CD-ROM offers two viewing options. The default option is 'hide particles' in which the sequence of transformation is shown as an 'everyday' phenomenon, for example an ice cube melting to depict the transformation from a solid to a liquid. The other option 'view particles' shows an animated representation of the particles moving and this 'scientific' view of particles is overlaid on the 'everyday' image. The potential for student interactivity to choose and move between these viewing options presents the 'everyday' concept of states of matter and the 'scientific' realism as discrete separate accounts of the world. Technology-mediated learning requires students to engage with and interpret a range of modes on screen-colour, movement, image and sound. One aspect of this interpretative work is the construction of different forms of realism. The different viewing options offered by the *Multimedia Science School* CD-ROM, as is the case with many applications for new technology, each realise different epistemological

positions to the phenomena being studied. The facilities of the screen re-configure, bring together, these different accounts of the world. The work of the student is to move between these two different accounts of the world, to distinguish between them, to compare, predict, and observe in order to understand scientific theory.

The constraints and possibilities for students choice of viewing position in such applications is central to learning as it enables students different positions to, and potentials for the production of school knowledge and learning. It can also realise new problems. For example, some students working with the *Multimedia School Science* CD-ROM read the 'scientific' representation of particles that is overlaid on the 'everyday' image of a liquid as 'one account' in which particles are understood as 'floating in jelly' that is, something separate from the liquid itself.

Similarly, the move from a traditional book version of a novel to a screen version of a novel in school English can transform curriculum concepts and the practices of reading. The multimodal resources of a CD-ROM of the Steinbeck (1937) novel *Of Mice and Men* (Penguin Electronic, 1996) in an English classroom served to transform the realisation of the curriculum concept character. The CD-ROM included images, video and audio clips of the novel's characters, with audio references to musical productions of the book, hyperlinks to maps and historical information on the setting of the book, and a range of other materials. This served to reshape the novel from a literary text to a quasi-documentary text. In turn this shifts the concept of character from its position as 'moral vehicle' in literary theory to 'the lived reality' of 'real historical people'.

The change in the modes of representation impacts not only on the mediation of the curriculum, the shape of knowledge to be learnt, but also on the practices of students (and teachers) in the classroom-the rules and norms that underpin their activity. Observing students engaged with multimodal texts, such as this one in the English classroom, shows the potential of new technologies to open up different paths for students in ways that re-mediate their practices of and engagement with texts. Some students 'read' the CD-ROM version of the novel *Of Mice and Men* as an on screen book, in which pages are divided across several screens and illustrated, and hyperlinks are embedded to explain slang words, and give historical details on the towns and places mentioned in the narrative. The practice of reading is turned into a dynamic movement between fiction and fact. Other students engaged with the video clips 'reading' the 'novel' as a film. Some students flicked through the illustrated screens of the 'novel' as a comic while others listened to the audio clips temporarily turning the novel into a musical.

The Role of Language on Screen

The presence of the modes of speech and writing (or linguistic modes) on the screen is often minimal. When writing is displayed on screen it is along-side other modes and these other modes, often images, tend to dominate the screen space. A range of modes are in play and, increasingly, the environment of new technology relies on 'non-linguistic' processes of communication and decision-making as people deconstruct visual symbols and click to progress. The visual links, shared visual objects and audio files made available by the facilities of new technologies can be designed to critique or mediate the written elements of a text on screen or to draw attention to potential layers of meaning and alternative readings in a written text. The multimodal facilities of the screen serve to de-centre speech and writing

and to distribute the functional load of a message across a range of modes. In the context of the screen the function of 'non-linguistic' modes is not merely to illustrate or support what is realised in speech and writing, rather these modes 'fill-up' concepts that are realised linguistically in quite different ways. Indeed as I have shown elsewhere (Jewitt, 2002, 2003), each of the modes displayed on a screen may attend to quite different aspects of what is being communicated linguistically. Increasingly, I want to suggest that writing on screen functions as a modal sign of or a reference to, the values of specialist knowledge, authority and authenticity associated with the printed era, the 'literary text' and the educated elite.

Language is de-centred by the emphasis of the majority of computer applications on the visual potential of writing (font, resources for indicating emphasis, materiality, colour, layout, and so on) in ways that change the practice of writing and reading. (It is important to note, however, that writing in its visual characteristics has always been present as a resource to calligraphers, typographers and others.) The visual semiotic resources of writing are used on screen (and elsewhere) to indicate and to classify the specific domains of knowledge on screen. They are used to visually distinguish between fact and fiction or the everyday and the scientific or that which is intended for a young or old audience. As words 'fly in', revolve and dissolve on the screen the boundary between writing and image appears increasingly blurred, indeed at times the boundary between word and image appears entirely permeable and unstable (Chaplin, 1994; Elkins, 1999). In this way, new technologies offer the potential to 'recast modes', to heighten the blurred boundaries between the visual and the written. At times writing on the screen becomes fully visual. When a block of type moves about the screen, interacting in rhythm with other modes, for instance, the tiny scrawl of printed words retreats to a textured pattern of lines and it is redefined as a visual representation on screen and the 'meaning' of what is written is transformed.

The de-centring of writing on the computer screen is connected, I want to argue, with the spatial resource of the screen. In computer mediated learning the spatial resource of the page is superseded by the spatial resource of the screen, and in this move the logic of the compositional meaning space is altered. The previous seemingly unalterably fixed uni-directionality of the written text ('the page') in the 'West' is altered to multiple directionality, which disturbs the logic of the 'line' as a textual/written entity. The same visual transformation is apparent in relation to elements such as the paragraph, which might be 'transformed' into a 'box of text' on screen. The use of scroll bars on the computer screen further disrupts the notion of page (Agarwal-Hollands and Andrews, 2001). In short, the screen as a site, both historically and materially, offers different potentials for language (writing and speech) and other 'non-linguistic' modes than the page. As a consequence of this writing and speech have come to have (to be given) different 'values' and meaning making potentials on screen than they have on the printed page.

Alongside the multimodal domain of the screen, as students work with computer applications they watch the screen, gesture at elements on the screen, move the mouse, and press the keyboard, and there is little or no talk involved. This suggests that educational researchers, perhaps more than ever, need to look beyond language to understand learning. The de-centring of language in this way has important implications for literacy that I discuss later in this paper.

The Relationships between Modes

The multiple combinations of modal resources that are possible on screen, the relations that these configure between modes through their arrangement and the semantic function of links between screens and elements are an important part of the construction of meaning. The configuration of modes on screen, the functional specialisation and functional load of modes in texts offer different meanings, and different filters for the understanding of a text. The ways in which modes are configured on screen also offer potentials for student engagement with computer texts such as the points of entry into a text, the possible paths through a text and the potential for them to re-make a text. Modes offer different ways into representation and focus on different aspects of its meaning. Alternatively the relationship configured between modes may realise a tension between the aspects of meaning in a text-a tension that is itself meaningful. The take up of modes and specific modal resources serves to shape the representation of what is included or excluded in the 'world' of a school subject such as English, Mathematics or Science, as well as the relation of the student user to that world of knowledge, and its coherence.

The structure of a text and the use of hyperlinks realise connections and dis-connections between screens (texts) and this contributes to the construction of meaning relations between elements. In these ways the structures and links of a text can produce a semiotic sense of containment where the path through screens is a tightly defined space, and the screen is itself boundaried. Alternatively a semiotic sense of 'openness' can be produced through the design of links and screen structures in which the reading path remains more open. The multimodal character of new technologies, and the multiple entry points it offers to a text, nonetheless always opens up the potential for the 'reader' to divert from the 'intended' reading path(s). The structures that contain and boundary a text, in a sense 'force' the user to make a decision, while a more open structure signals the expectation on the 'reader' to explore the resources and potentials for action.

Just as modes appear differently in the traditional school Science classroom than they do in the English classroom (Kress et. al., 2001; Kress et. al., forthcoming) this modal difference holds true for technology-mediated learning. For instance, writing appears to have a different genre and function in the case of English CD-ROMs as compared with those of Maths and Science (Jewitt, 2003b). Writing (and speech) in English applications tend to address the 'audience' directly, in the form of a narrative and presents writing and the novel as central to the school subject English. In contrast, Maths and Science applications contain little writing. What writing there is on screen is in the form of lists, factual statements, classifications, definitions and instruction rather than that of a narrative form. In these cases writing functions to 'name' the visual.

The use of image in such applications also varies, in relation to context, colour, style, and use of symbolic icons. For example, the images of the Steinbeck CD-ROM mentioned earlier use a limited range of colours, the colours are muted (un-saturated) and the style of the image is that of a hand-drawn illustration (in fact a transformation of film stills in an application similar to Photo-shop). This use of colour and style serves to associate the images in the CD-ROM with the genre of literary illustration often found in a printed book. The icons used in the CD-ROM, the 'spotlight' style images of actors, the image of a novel, playing cards, and so on serve to visually signify the subject English as a world of social knowledge, history and tradition. In the multimodal computer application, *Multimedia Science School*

meaning is realised 'between' the mode of image, the limited written and numerical elements, and the movement of the elements. The use of visual resources in the application suggests the need to re-think (re-visualise) the world as it is usually experienced. Visual representation in science, of the world beyond the usual experience of people, stands in contrast to the visual association with the past in the CD-ROM designed for use in school English.

Through the use of colour, image, writing, and action in the applications designed for specific school subjects different discourses are produced and realised around knowledge and the subjectivity of the learner. This demonstrates the need for a multimodal theory that accounts for the complexity of the relations between modes.

Multimodality and Learning

Students engage with these applications multimodally. They point, gesture, gaze at the screen, move the mouse (or joystick) and click on icons and, sometimes, they talk. Just as the modal elements on screen offer different affordances for the construction of curriculum knowledge so do the different modes of interaction with the computer screen.

When a student makes a gestured 'mark' across the screen to represent their imagined movement of an element, for instance, this gesture is temporary and ephemeral. It does not demand the modal commitment (the permanence) of a drawn or animated line of trajectory with the resources of an application. Students use gesture to plan and imagine, and to test theories and ideas. Through gesture the students 'create' a space of activity that overlays the computer screen. 'Within' such applications the spatial resources of the screen itself become meaningful and indicates different kinds of activity, such as constructing elements, note taking and so on. In the case of the Steinbeck and *Multimedia Science School* CD-ROMs these areas were designed and designated by the makers of the application, in other applications however these areas are created by the interaction of the students. Once the students engage with the mouse or keyboard the character of their gestures were transformed to more 'permanent' realisations of plans and instructional gestures that, were they to be 'translated' into words, would be along the lines of 'go here' 'click here', or 'select this'.

Gaze is a resource employed by students in the organisation of their interaction with the screen often visualised in the movement of the cursor on screen. Gaze is a resource that software designers have used to engage the user since the early tool bars of the Mac Classic with 'eyes' that 'follow' the cursor on the screen, through to the humanoid robots of the application Toontalk (Jewitt and Adamson, in press). These material signs realised through gaze can, I argue, be interpreted as a multimodal sign of interest, attention and intention both of the designer and the students. By attending to the mode of gaze what may at first be taken as lack of engagement with a text, for example, flicking quickly through the screens of a CD-ROM, can be understood as a kind of engagement.

This move beyond a focus on language alone and attention to the multimodal activity of students with the screen enables different kinds of learning, engagement and students' production of 'learning spaces' to be bought into the analytical frame. This includes the 'non-linguistic' work of planning and thinking, making and constructing, playing and reviewing, and moving through and transforming

texts as a part of learning. As students often say nothing as they work on the computer, especially those who have a shared history of working together (Crook, 1999), moving beyond language is important, I argue, as it re-theorises much of what goes on with and around computers as potential learning.

In the classroom students working with new technologies are involved in the complex task of transforming information across and between modes, for example they may be working with a multimodal entity on screen to produce a written account of that entity-what Kress (2003) has called 'transduction'. For example, the students working with the Steinbeck CD-ROM in the English classroom are engaged in the task of producing a sign of character drawing on the multimodal signs offered by the CD-ROM. The work of the student is to select the criterial aspects of the entity 'character' to make their own sign, drawing on the affordances of modes, and based on their interest and the framing of the task by the teacher. Such tasks demand the remaking of signs and involve the student in the transformation of knowledge in order to remake the sign 'character' according to their interests and knowledge. The multimodal environment of the screen provides students with a range of resources for meaning making and these multimodal representations are then 'taken in' 'internalised' and become tools for thinking with. As each mode shapes knowledge differently modes attend differently to the aspects of meaning being made and modes therefore provide the students with different tools for thinking with. Given the multimodal character of the resources of new technology and students engagement with these, a language centred approach to learning and assessment therefore fails to attend to the complex activity (creativity) and learning of the students in the classroom.

Multimodality and Literacy

Students are engaged in the work of interpreting and making meaning with a whole range of modes, image, writing, animated movement, colour, sound-effect, music and the configuration of these modes on screen. (Indeed this is always the case in the classroom, although differently so on screen.) Students and teachers are involved in making sense of this multimodal environment. All of these modes work together to realise meaning and writing and speech are embedded in this multimodal ensemble; each mode offers different resources for meaning making and all modes including language, speech and writing, are partial in the realisation of this meaning. For these reasons a focus on language alone can not give a full account of what literacy is (Kress, 2003). There is, therefore, a need to expand our understanding of literacy in relation to new technology and, more broadly, to re-think literacy in order to accommodate the complex multimodal literacy repertoires that young people develop in the multimodal environment that they live in (Snyder, 2002; Street, 1998).

Whereas in the recent past images have been on the whole secondary and backgrounded with respect to language in relation to formal education, this relationship is changed in technology-mediated learning (and I would argue elsewhere). This change is marked by the increase in visual representation and the visualisation of writing as a mode. The 'reader' is involved in the task of finding and creating reading paths through the multimodal, multidirectional texts on the screen-a fluidity that is beginning to seep out onto the page of printed books (Moss, 2001; Kress, 2003). Writing, image and other modes combine to convey

multiple meanings and encourage the reader to reject a single interpretation and to hold possible multiple readings of a text (Coles and Hall, 2001). The multimodal character of the screen does not indicate a single entry point, a beginning and an end, rather it indicates that texts are layered and offers multiple entry points. This offers the 'reader' new potentials for 'reading' a text and the design of the text through engagement with it. Multiple reading paths have always been a part of the repertoire of an experienced reader (Coles and Hall, 2001) multimodal texts of the screen, however, redefine the work of the reader, who has to work to construct a narrative or assert their own meanings via their path through a text. The design of some children's books (such as *The Jolly Pocket Postman*, Ahlberg and Ahlberg, 1995) and many magazines aimed at young people serves to fragment the notion of narrative and to encourage the reader to see themselves as 'writers'. In doing so these texts 'undo' the literary forms of closure and narrative. Nonetheless, the potentials for movement and closure through screen texts is fundamentally different from the majority of classic book based literary forms and offer the reader the potential to 'create' (however partially) the text being read.

Against this background, however, educational policy and assessment continues to promote a linguistic view of literacy and a linear view of reading which fails to connect with the kinds of literacy required in the school with the 'out-of-school worlds' of most young people. The government's National Literacy Strategy (DFES, 1998) is, for example, informed by a linguistic and print-based conceptualisation of literacy in which the focus is on 'word', 'sentence', and 'text'. The Literacy Strategy and the National Curriculum more generally, herald new technologies as a useful learning tool but the multimodal character of new technologies produces a tension for traditional conceptions of literacy that maintain language at their centre. Traditional forms of assessment, for instance, place an emphasis on students' hand-writing and spelling, skills that the facilities of computers make differently relevant for learning. At the same time, assessment fails to credit the acquisition of new skills that new technologies demand of students-such as finding, selecting, processing and presenting information from the internet and other sources (Somekh et. al, 2001a). I want to suggest that the multimodal character and facilities of new technology require that traditional (print-based) concepts of literacy be reshaped as what it means to be literate in the digital era of the twenty-first century is different than what was needed previously (Gardener, 2000). If school literacy is to be relevant to the demands of the multimodal environment of the larger world, it must move away from the reduction of literacy to 'a static series of technical skills' or risk 'fostering a population of functional illiterates' (McClay, 2002). In short, school literacy needs to be expanded to reflect the semiotic systems that young people use (Unsworth, 2001).

Many others have argued that the concept of literacy needs to be expanded beyond language to account for the demands of new technology. Students who are engaged with multimodal texts in the classrooms are not interpreting image in isolation of writing, or digital medium texts from print texts, rather they are engaged in the task of interpretation in a multimodal and multimedia environment. To separate visual literacy, moving image literacy, and so on maintains the status quo in which literacy as language remains intact and boundaried: it just has more 'competition' in the communicational world. It is more useful, I want to suggest, to reconsider the notion of literacy itself as one of multimodal design as this reflects the 'reality' that modes are fully integrated, that there is not, and never has been, a

purely linguistic text as writing is itself multimodal (Kenner, in press). What there has been, is an educational focus on language, a privileging of language over other modes, other modes that have always been present but not always attended to (especially within educational research). To talk of multimodal literacy is to attend to all that is going on, including the visual character of writing (font, layout, colour), to listen to the 'breathiness', the tone, the pitch, the voice quality of speech and to understand these as semiotic resources (meaning potentials). Conceptions of literacy need to be expanded beyond language to all modes and the static notion of literacy as the acquisition of sets of competencies needs to be replaced with a notion of literacy as a dynamic process through which students use and transform multimodal signs and design new meanings.

Conclusion

The multimodal resources and facilities of new technology can reconfigure the work of the student. There are 'losses and gains for learning' (Kress, 2003) in the change of technology and mode. However, as I hope I have made clear, it is not that one technology is 'better' than another but rather that technologies reshape knowledge and enable (and demand) students to engage with knowledge in different kinds of ways, and in the process offer them different potentials for learning. The relationship between mode, technology and the construction of curriculum knowledge is therefore fundamental in three respects. First, it reshapes the curriculum concepts being presented in the classroom, frequently (although not always) in significant ways for learning. (Perhaps it is important to be clear that for me 'significant' does not mean 'better'.) Second, the representations of knowledge afforded by the facilities of new technologies serve to reposition students to the production and construction of school knowledge. Third, it impacts on the roles, relationships and practices, such as reading and literacy that underlie the production of school knowledge. For these reasons the changes in the representational and communicational forms (and facilities) made possible by new technologies are neither superficial nor irrelevant to teaching and learning.

References

Agarwal-Hollands, U., and Andrews, R. (2001) ' From Scroll… to Codex…and Back Again', *Education, Communication and Information* 1 (1): 15 -36.
Chaplin, E. (1994) *Sociological and Visual Representation*. London: Routledge.
Coles, M. and Hall, C. (2001) 'Breaking the line: new literacies, postmodernism and the teaching of printed texts', *UKRA* 35 (3): 111-114.
Crook, C. (1999) 'Computers in the Community of the Classroom', in K. Littleton and P. Light (eds.) *Learning Computers: Analyzing Productive Interaction*, pp. 102-117. London: Routledge.
DFES (1998) The National Literacy Strategy. *(www.nc.uk.net)*
Elkins, J. (1999) *The Domain of Images*. New York: Cornell University Press.
Gardener, P. (2000) *Literacy and Media Texts in Secondary English*. London: Cassell Education.
Jewitt, C., Kress, G., Ogborn, J. and Tsatsarelis, C. (2001) 'Teaching and Learning Beyond Lanuage', *Teaching Education* 11 (3): 327-343.
Jewitt, C. (2002) 'The move from page to screen: the multimodal reshaping of school English', *Journal of Visual Communication* 1(2): 171-196.

Jewitt, C.(2003) 'Multimodality and computer mediated learning' in Jewitt,C., and Kress, G. (eds.) *Multimodal Literacy* pp: 34-55. New York: Peter Lang.

Jewitt, C. (2003b*) A multimodal framework for computer mediated learning: reshaping knowledge, literacy and learning*. Ph.D. University of London.

Jewitt, C. and Adamson, R. (in press) 'Multimodal construction of rule in computer programming' Education, Communication and Information, 3(3).

Kress, G. (2003) *Literacy in the New Media Age*. London: Routledge.

Kress, G (2003b) 'Losses and Gains' Seminar paper given at Institute of Education, University of London, October, 2003.

Kress, G., Jewitt, C., Ogborn, J. and Tsatsarelis, C. (2001) *Multimodal Teaching and Learning: Rhetorics of the Science Classroom.* London: Continuum.

Kress, G., Jewitt, C., Bourne, J., Franks, A., Hardcastle, J., Jones, K. and Reid, E. (in preparation) *Urban Classrooms, Subject English: Multimodal Perspectives on Teaching and Learning*. London: RoutledgeFalmer.

McClay, J. (2002) 'Intricate complexities', *English in Education* 36 (1): 36- 54.

Moss, G. (2001) 'To Work or Play? Junior Age Non-fiction as Objects of Design', *Reading, Literacy and Language* 35(3): 106-10. *Multimedia Science School* (CD-ROM) 2003. Oxon: New Media Press.

Snyder, I. (ed.) (2002) *Silicon Literacies: Communication, Innovation and Education in the Electronic Age*. London: Routledge.

Somekh, B., Mavers, D., and Lewin, C. (2001) *Using ICT to Enhance Home-School Links: An Evaluation of Current Practice in England*. London: Department for Education and Skills.

Steinbeck Series (1996) *Of Mice and Men* (CD-ROM). New York: Penguin Electronics.

Steinbeck, J. (1937) *Of Mice and Men*. London: Penguin.

Street, B. (1998) 'New Literacies in Theory and Practice: What are the Implications for Language in Education', *Linguistics and Education* 10 (1): 1-24.

Unsworth, L. (2001) *Teaching Multiliteracies across the Curriculum: Changing Contexts of Text and Image in Classroom Practice*. Buckingham: Open University Press.

About the Author

Carey Jewitt is a Research Fellow at the Institute of Education, University of London.