

Digital Media Literacies: rethinking media education in the age of the Internet

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ABSTRACT This article considers how media educators can respond to the new challenges and opportunities of the Internet, and of digital media more broadly. It begins by exploring the value and limitations of the notion of 'literacy' in this context. It argues that 'competence-based' definitions of literacy tend to neglect the social diversity of literacy practices, and to retain a narrow focus on 'information', and it suggests that a broader definition of literacy necessarily entails a more critical approach. It then moves on to consider the nature of *digital* literacy more specifically. It argues that definitions of digital literacy have tended to take a rather limited view of information, and of issues of reliability and bias, and it proposes a broader approach which recognises the social and ideological nature of all forms of mediated representation. Following from this, it then provides some concrete indications of ways in which media education approaches might be applied specifically to the analysis of the World Wide Web, using the established framework of 'key concepts' (representation, language, production, audience). Finally, it considers the potential of digital media production in the classroom as a means of promoting digital literacy. It distinguishes between the approach adopted by media educators and more instrumental or expressive approaches. It then considers the difficulties of such work in a context where a 'digital divide' in access to technology continues to exist, both within and between societies. It argues that the benefits of digital technology in this respect depend crucially on the pedagogic and social contexts in which such technology is used, for example, in the opportunities that are provided for collaborative production and for students sharing their work with a wider audience. The article concludes by arguing that digital literacy needs to be seen as part of a broader reconceptualisation of literacy, and of the use of technology in education.

Over the past 20 years, there have been many attempts to extend the notion of literacy beyond its original application to the medium of writing. As long ago as 1986, one of the leading British researchers in the field, Margaret Meek Spencer, introduced the notion of 'emergent literacies' in describing young children's media-related play (Spencer, 1986), and the call for attention to 'new' or 'multiple' literacies has been made by many authors over subsequent years (Bazalgette, 1988; Buckingham, 1993a; Tyner, 1998; Cope & Kalantzis, 2000; and many others). We have seen extended discussions of visual literacy (e.g. Moore & Dwyer, 1994), television literacy (Buckingham, 1993b), cine-literacy (British Film Institute, 2000), and information literacy (Bruce, 1997). Exponents of the so-called New Literacy Studies have developed the notion of 'multiliteracies', referring both to the social diversity of contemporary forms of literacy, and to the fact that new communications media require new forms of cultural and communicative competence (Cope & Kalantzis, 2000).

This proliferation of literacies may be fashionable, but it raises some significant questions. Popular discussions of 'economic literacy', 'emotional literacy' and even 'spiritual literacy' seem to extend the application of the term to the point where any analogy to its original meaning (that is, in relation to written language) has been lost. 'Literacy' comes to be used merely as a vague synonym for 'competence', or even 'skill'. It is worth noting in this respect that such expressions may be specific to the English language. In some other languages, the equivalent term is more overtly tied

to the notion of writing – as in the French word ‘*alphabétisation*’, while in other cases, ‘*media literacy*’ is often translated into a more general term for skill or competence – as in the German ‘*Medienkompetenz*’.

The term ‘*literacy*’ clearly carries a degree of social status, and to use it in connection with other, lower status forms such as television, or in relation to newer media, is thus to make an implicit claim for the latter’s validity as an object of study. Yet, as uses of the term multiply, the polemical value of such a claim – and its power to convince – is bound to decline. Thus, while recognising the significance of visual and audio-visual media, some scholars challenge this extension of the term, arguing that ‘*literacy*’ should continue to be confined to the realm of writing (Barton, 1994; Kress, 1997), while others dispute the idea that visual media require a process of cultural learning that is similar to the learning of written language (Messaris, 1994). The analogy between writing and visual or audio-visual media such as television or film may be useful at a general level, but it often falls down when we look more closely: it is possible to analyse broad categories such as narrative and representation across all these media, but it is much harder to sustain more specific analogies, for example, between the film shot and the word, or the film sequence and the sentence (Buckingham, 1989).

So what are the possibilities and limitations of the notion of ‘*digital literacy*’? Is it just a fancy way of talking about how people learn to use digital technologies, or is it something broader than that? Indeed, do we really need yet another literacy?

Defining Literacy: the limits of competence

Many educational conceptions of literacy tend to define it in terms of a set of skills or competencies. The definition of media literacy adopted by the UK media regulator Ofcom (2004) – itself an adapted version of an earlier US definition (Aufderheide, 1997) – provides a fairly clear and succinct example of this approach: ‘*media literacy is the ability to access, understand and create communications in a variety of contexts*’. *Access* thus includes the skills and competencies needed to locate media content, using the available technologies and associated software. At least in Ofcom’s usage, it also includes the ability to regulate (or self-regulate) access, for example, by being aware of potential risks, and using regulatory mechanisms and systems of guidance. *Understand* includes the ability to decode or interpret media, for example, through an awareness of formal and generic conventions, design features and rhetorical devices. It also involves a knowledge of production processes, and of patterns of ownership and institutional control, and an ability to critique media, for example, in terms of the accuracy or reliability of their representations of the real world. Finally, *create* involves the ability to use the media to produce and communicate one’s own messages, whether for purposes of self-expression or in order to influence or interact with others.

Of these, access is perhaps the easiest to identify and measure – and it may be partly for this reason that much of Ofcom’s subsequent research on media literacy has focused on this aspect (e.g. Ofcom, 2006). In terms of official definitions of print literacy (see Levene, 1986), access could be seen as a form of *functional* literacy: it is essentially a matter of whether people know enough about media and technology to be able to function in society at a fairly basic level. As we shall see shortly, most definitions of ‘*digital literacy*’ (or ‘*Internet literacy*’ or ‘*computer literacy*’) tend to remain at this level. By contrast, understanding and creativity are much harder to assess: what *counts* as a valid or legitimate or desirable form of understanding or creativity is not something that can easily be agreed upon. As this implies, Ofcom’s definition and others like it tend to avoid some of the more potentially controversial issues at stake in defining literacy.

By contrast, sociological and anthropological studies of print literacy (e.g. Heath, 1983; Street, 1984) have clearly shown that literacy cannot be regarded as merely a set of competencies that live in people’s heads. On the contrary, literacy is a phenomenon that is only realised in and through social practices of various kinds, and it therefore takes different forms in different social and cultural contexts. In studying literacy, we cannot confine our attention to the isolated encounter between the reader and the text. We need to take account of the interpersonal context in which that encounter takes place (where the text is read, with whom, and why), and the broader social and economic processes that determine how texts are produced and circulated. This implies that literacy is inevitably a contested field. Some manifestations of competence or understanding are

bound to be perceived as more socially legitimate than others. Literacy is inevitably related to the question of who owns and controls information, and the means by which it is generated and distributed. Definitions of literacy are thus necessarily ideological, in that they imply particular norms of social behaviour, and particular relationships of power. As such, the meaning of literacy is open to negotiation and debate: it is not something that can easily be reduced to a set of skills, which can be taught in abstract terms, and then be applied and tested.

Discussions of digital literacy – and to some extent of media literacy as well – often place the primary emphasis on *information*. The key concern is with locating, using, evaluating and producing information. Yet it is no longer particularly useful to think of digital media merely in terms of ‘information technology’: with the growing convergence of media (which is driven by economics as much as by technology), the boundaries between ‘information’ and other media have become increasingly blurred. In most children’s leisure-time experiences, computers are much more than devices for information retrieval: they convey images and fantasies, provide opportunities for imaginative self-expression and play, and serve as a medium through which intimate personal relationships are conducted. Recognising this certainly means broadening our conception of technology – not least in education: information and communications technologies (ICTs) are clearly no longer just a matter of desktop computers, or indeed necessarily of computers at all. We need to acknowledge the fact that digital media are *cultural forms* that are inextricably connected with other visual and audio-visual media. Yet this also further unsettles normative conceptions of media literacy as a set of universally applicable skills. Like ‘older’ media, digital media inevitably raise complex questions about taste, pleasure and identity that cannot simply be reduced to a narrowly rationalistic formula.

Equally controversially, one can argue that literacy also contains a *critical* dimension. When we describe somebody as a ‘literate’ person, we do not simply mean that he or she can read and write. Particularly in an educational context, the notion of literacy generally implies a more reflexive approach. Literacy in this broader sense involves analysis, evaluation and critical reflection. It entails the acquisition of a meta-language – that is, a means of describing the forms and structures of a particular mode of communication, and it involves a broader understanding of the social, economic and institutional contexts of communication, and how these affect people’s experiences and practices (Luke, 2000). According to advocates of the ‘multiliteracies’ approach (Cope & Kalantzis, 2000), literacy education cannot be confined simply to the acquisition of skills, or the mastery of particular practices; it must also entail a form of ‘critical framing’ that enables the learner to take a theoretical distance from what they have learned, to account for its social and cultural location, and to critique and extend it.

Even so, this notion of critical literacy raises some significant difficulties, which have been widely discussed in the context of media education (e.g. Buckingham, 1998). There seems to be little place in some conceptions of media literacy for aspects of pleasure, sensuality and irrationality that are arguably central to most people’s experience of media, and of culture more broadly. For example, the emphasis on critical distance fits awkwardly with the experience of ‘immersion’ and spontaneous ‘flow’ that is frequently seen as fundamental to computer gaming (Carr et al, 2006); or indeed with the emotional intensity and intimacy of some forms of online communication. As such, the notion of literacy might be seen to sanction a narrow, rationalistic view of how a well-regulated individual should behave in relation to the media – a view that is arguably quite at odds with how the majority of users behave, or might *wish* to behave.

Internet Literacy: from access to critical understanding

There is undoubtedly a tension here between a broadly social model of media literacy and what we might call a competency-based approach – and this is a tension that needs to be more fully explored. However, most conceptions of ‘digital literacy’ are a long way from addressing these more complex issues. The notion of digital literacy is not new. Indeed, arguments for ‘computer literacy’ date back at least to the 1980s. Yet, as Goodson & Mangan (1996) have pointed out, the term ‘computer literacy’ is often poorly defined and delineated, both in terms of its overall aims and in terms of what it actually entails. As they suggest, rationales for computer literacy are often based on dubious assertions about the vocational relevance of computer skills, or about the

inherent value of learning with computers, which have been widely challenged. In contemporary usage, digital (or computer) literacy often appears to amount to a minimal set of skills that will enable the user to operate effectively with software tools, or in performing basic information retrieval tasks. This is essentially a *functional* definition: it specifies the basic skills that are required to perform particular operations, but it does not go very far beyond this.

For example, the British government has attempted to define and measure the ICT skills of the population alongside traditional literacy and numeracy as part of its *Skills for Life* survey (Williams et al, 2003). This survey defines these skills at two levels. Level 1 includes an understanding of common ICT terminology; the ability to use basic features of software tools such as word-processors and spreadsheets; and the ability to save data, copy and paste, manage files, and standardise formats within documents. Level 2 includes the use of search engines and databases, and the ability to make more advanced use of software tools. In the 2003 survey, over half of the sample of adults was found to be at 'entry level or below' (that is, not yet at Level 1) in terms of practical skills. Other research suggests that adults' ability to use search engines for basic information retrieval, for example, is distinctly limited (Livingstone et al, 2005, pp. 23-24).

Another context in which the notion of digital literacy has arisen in recent years is in relation to online safety. For example, the European Commission's 'Safer Internet Action Plan' has emphasised the importance of Internet literacy as a means for children to protect themselves against harmful content. Alongside the range of hotlines, filters and 'awareness nodes', it has funded several educational projects designed to alert children to the dangers of online paedophiles and pornography – although in fact it is notable that many of these projects have adopted a significantly broader conception of Internet literacy, that goes well beyond the narrow concern with safety. The 'Educaunet' materials, for example, provide guidance on evaluating online sources and assessing one's own information needs, as well as recognising the necessity and the pleasure of risk for young people (see <http://www.educaunet.org>).

Even so, most discussions of Internet literacy remain at the level of assessing the reliability or validity of online *information* – and therefore tend to neglect some of the broader cultural uses of the Internet (not least by young people). To a large extent, the concern here is with promoting more efficient uses of the medium – for example, via the development of advanced search skills (or so-called 'power searching') that will make it easier to locate relevant resources amid the proliferation of online material. This ability to *access* or locate information is undoubtedly important; yet the skills children need in relation to digital media go well beyond this. As with print, they also need to be able to evaluate and use information critically if they are to transform it into knowledge. This means asking questions about the sources of that information, the interests of its producers, and the ways in which it represents the world, and understanding how technological developments and possibilities are related to broader social and economic forces.

Popular guides to the Internet have begun to address the need to evaluate online content. For example, Paul Gilster's *Digital Literacy* (1997) is primarily concerned with what he calls the 'survival skills' that users need to locate Internet sources. He provides guidance on web-searching, engaging in dialogues with web authors, and issues such as copyright online, although he also suggests some approaches to verifying the provenance of online information. Likewise, David Warlick's (2005) *Teacher's Guide to Digital Literacy* is primarily a how-to guide, including step-by-step instructions on setting up Internet mailing lists or retrieving information from web pages, as well as suggestions for classroom projects, although he too offers brief guidance on evaluating the credibility and reliability of online resources, for example, by researching the author or 'backtracking' the URL. As Livingstone et al (2005) point out, there are overlaps here between this notion of digital (or specifically Internet) literacy and the older concept of 'information literacy', which derives primarily from Library and Information Sciences.

Ultimately, however, these formulations tend to operate with a fairly functional conception of literacy. They focus on technical 'know-how' and procedures that are relatively easy to acquire, and on skills that are likely to become obsolete fairly rapidly. Much of the discussion appears to assume that information can simply be assessed in terms of its factual accuracy. From this perspective, a digitally literate individual is one who can search efficiently, who compares a range of sources, and sorts authoritative from non-authoritative, and relevant from irrelevant, documents (Livingstone et al, 2005, p. 31). There is little recognition here of the symbolic or persuasive aspects

of digital media, of the emotional dimensions of our uses and interpretations of these media, or indeed of aspects of digital media that exceed mere 'information'.

Nicholas Burbules & Thomas Callister (2000) go somewhat further, arguing that web users need to become 'hyperreaders', who are able to read selectively, and to evaluate and question the information they encounter online. 'Hyperreaders' will compare different information sources; assess how the authority of sites is claimed and established; analyse who produced the site, and why they did so; and consider what might be absent, and why. These authors draw particular attention to the role of web links, arguing that links in themselves serve rhetorical functions, not least in supporting claims to credibility: as well as guiding and controlling users' access to information, they also express meanings, suggest inferences and ultimately betray particular biases. However, Burbules & Callister challenge the idea that these procedures will necessarily enable the user to arrive at objective truth: rather, the aim is to enable users to become more critically aware of how the medium works – and they argue that this can be effectively achieved, not only through analysis, but also by students learning to produce their own hypertexts.

Bettina Fabos (2004) and Ellen Seiter (2005) are more specifically concerned with the commercial dimensions of online information. They draw attention to the increasing role of sponsorship, online marketing, product placement, data mining and other means of gathering commercial information about users; and, as they point out, most young people (and indeed most teachers) are less likely to be aware of these aspects than they are, for example, of the role of commercials on television. As Seiter argues, for most users 'the Internet is more like a [shopping] mall than a library: it resembles a gigantic public relations collection more than it does an archive of scholarship' (2005, pp. 37-38).

Fabos (2004) is particularly concerned about the unthinking use of commercial search engines in schools, and she provides a useful review of schools' attempts to promote more critical evaluation of online content. These typically include addressing issues such as the authorship and sponsorship of sites; the accuracy and objectivity of information; and the currency, scope and depth of sites. However, Fabos argues that such evaluation 'checklists' are often less than effective, and that students may feel inadequate assessing sites when they are unfamiliar with the topics they cover. Her classroom research suggests that, in practice, students largely failed to apply these criteria, instead emphasising speedy access to information and appealing visual design.

More to the point, however, such 'web evaluation' approaches appear to presume that objective truth will eventually be achieved through a process of diligent evaluation and comparison of sources. They imply that sites can be easily divided into those that are reliable, trustworthy and factual, and those that are biased and should be avoided. In practice, such approaches often discriminate against low-budget sites produced by individuals, and in favour of those whose high-end design features and institutional origins lend them an air of credibility. The alternative, as Fabos suggests, is to recognise that 'bias' is unavoidable, and that information is inevitably 'couched in ideology'. Rather than seeking to determine the 'true facts', students need to understand 'how political, economic, and social context shapes all texts, how all texts can be adapted for different social purposes, and how no text is neutral or necessarily of 'higher quality' than another' (Fabos, 2004, p. 95).

Laura Gurak (2001) makes a similar argument for what she terms 'cyberliteracy'. 'To be truly literate online', she argues, 'users must understand the economic and political forces that are shaping information technologies' (2001, p. 12). As she argues, 'technological literacy' is typically confined to learning how to use a computer and a keyboard, or how to do online searches. By contrast, a *critical* literacy would involve the ability to understand and make informed judgements about the place of technology within society and culture. The Internet, she argues, is by no means a neutral technology: it has been socially shaped in particular ways, not least by the powerful commercial, governmental and military interests that have determined its basic architecture. In this sense, as I have argued, the question of literacy is inevitably connected with broader questions of social power.

This position, which Fabos (2004) defines as characteristic of 'critical literacy' research (e.g. Luke, 2000), is also the one adopted by media educators – and indeed, I would argue that media education has a more concrete and coherent framework for addressing such issues. In the following section, I outline a media educator's approach to digital literacy, and show how it might be applied specifically to analysing the World Wide Web.

Media Literacy Goes Online

There are four broad conceptual aspects that are generally regarded as essential components of media literacy. These have been most coherently elaborated over the past 20 years by media educators in the United Kingdom, and increasingly around the world: a fuller discussion may be found in my book *Media Education* (Buckingham, 2003). While digital media clearly raise new questions, and require new methods of investigation, this basic conceptual framework continues to provide a useful means of mapping the field.

Representation. Like all media, digital media represent the world, rather than simply reflect it. They offer particular interpretations and selections of reality, which inevitably embody implicit values and ideologies. Informed users of media need to be able to evaluate the material they encounter, for example, by assessing the motivations of those who created it and by comparing it with other sources, including their own direct experience. In the case of information texts, this means addressing questions about authority, reliability and bias, and it also necessarily invokes broader questions about whose voices are heard and whose viewpoints are represented, and whose are not.

Language. A truly literate individual is able not only to use language, but also to understand how it works. This is partly a matter of understanding the 'grammar' of particular forms of communication, but it also involves an awareness of the broader codes and conventions of particular genres. This means acquiring analytical skills, and a meta-language for describing how language functions. Digital literacy must therefore involve a systematic awareness of how digital media are constructed, and of the unique 'rhetorics' of interactive communication: in the case of the Web, for example, this would include understanding how sites are designed and structured, and the rhetorical functions of links between sites (cf. Burbules & Callister, 2000, pp. 85-90).

Production. Literacy also involves understanding who is communicating to whom, and why. In the context of digital media, young people need to be aware of the growing importance of commercial influences – particularly as these are often invisible to the user. There is a 'safety' aspect to this: children need to know when they are being targeted by commercial appeals, and how the information they provide can be used by commercial corporations. But digital literacy also involves a broader awareness of the global role of advertising, promotion and sponsorship, and how they influence the nature of the information that is available in the first place. Of course, this awareness should also extend to non-commercial sources and interest groups, who are increasingly using the Web as a means of persuasion and influence.

Audience. Finally, literacy also involves an awareness of one's own position as an audience (reader or user). This means understanding how media are targeted at audiences, and how different audiences use and respond to them. In the case of the Internet, this entails an awareness of the ways in which users gain access to sites, how they are addressed and guided (or encouraged to navigate), and how information is gathered about them. It also means recognising the very diverse ways in which the medium is utilised, for example, by different social groups, and reflecting on how it is used in everyday life – and indeed how it might be used differently. (In some respects, of course, the term 'audience' [which is easily applied to 'older' media] fails to do justice to the interactivity of the Internet – although substitute terms are no more satisfactory [Livingstone, 2004]).

Figure 1 indicates some of the issues that might be addressed in applying this framework specifically to the World Wide Web, and is adapted from Buckingham (2003). It incorporates several of the key concerns of the 'web evaluation' approaches discussed above, but sets these within a broader context. (Different issues would undoubtedly need to be explored in relation to other uses of the Internet, such as email, instant messaging or blogging.)

The digital literacy 'recipe' outlined here is intended only as a brief indication of the possibilities: more detailed proposals for classroom practice can be found elsewhere (e.g. Frechette, 2002; MacDougall, 2006). Obviously, these suggestions will vary according to the needs and interests of the students, although it should be possible to address the general conceptual issues at any level. Nevertheless, it should be apparent that approaching digital media through media education is about much more than simply 'accessing' these media, or using them as tools for learning: on the contrary, it means developing a much broader *critical understanding*, which

addresses the textual characteristics of media alongside their social, economic and cultural implications.

<p>Representation How websites claim to 'tell the truth', and establish their authenticity and authority. The presence or absence of particular viewpoints or aspects of experience. The reliability, veracity and bias of online sources. The implicit values or ideologies of web content, and the discourses it employs.</p> <p>Language The use of visual and verbal 'rhetorics' in the design of websites (for example, graphic design principles, the combination of visuals and text, the use of sound). How the hypertextual (linked) structure of websites encourages users to navigate in particular ways. How users are addressed: for example, in terms of formality and 'user-friendliness'. The kinds of 'interactivity' that are on offer, and the degrees of control and feedback they afford to the user.</p> <p>Production The nature of web authorship, and the use of the Internet by companies, individuals or interest groups as a means of persuasion and influence. The technologies and software that are used to generate and disseminate material on the Web, and the professional practices of web 'authors'. The significance of commercial influences, and the role of advertising, promotion and sponsorship. The commercial relationships between the Web and other media such as television and computer games.</p> <p>Audience The ways in which users can be targeted by commercial appeals, both visibly and invisibly. The nature of online 'participation', from web polls to bulletin boards to 'user-generated content'. How the Web is used to gather information about consumers. How different groups of people use the Internet in their daily lives, and for what purposes. How individuals or groups use and interpret particular sites, and the pleasures they gain from using them. Public debates about the 'effects' of the Internet, for example, in relation to online safety and 'addiction'.</p>
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Figure 1. Media literacy and the World Wide Web.

Creating Digital Media

The understandings I have identified here are not only gained through critical analysis: they can also be developed – in some instances, more effectively and enjoyably – through the experience of creative production. Media literacy involves 'writing' the media as well as 'reading' them; and here again, digital technology presents some important new challenges and possibilities. The growing accessibility of this technology means that quite young children can easily produce multimedia texts, and even interactive hypermedia – and increasing numbers of children have access to such technology in their homes.

As with older media (Lorac & Weiss, 1981), teachers are increasingly using multimedia authoring packages as a means of assisting subject learning in a range of curriculum areas. Here, students produce their own multimedia texts in the form of websites or CD-ROMs, often combining written text, visual images, simple animation, audio and video material (Sefton-Green, 1999a). Lachs (2000), for example, describes a range of production activities undertaken with primary school students in learning about science, geography or history. These projects generally involve children 're-presenting' their learning for an audience of younger children in the form of multimedia teaching materials or websites. One of the most challenging aspects of this work is precisely the interactivity: the students have to think hard about how different users might interpret and use what they produce, and how they will navigate their way around. Yet although the children's productions frequently draw on elements of popular culture (such as computer games), the content of the productions is primarily factual and informational – and in this sense, the preferred genre is that of 'edutainment'.

Other potential uses of digital media have emerged from arts education. These projects often involve the participation of 'digital artists' external to the school, and their primary emphasis is on the use of the media for self-expression and creative exploration. Thus, students may experiment with the possibilities of different art forms, and the ways in which they can be combined and manipulated using the computer, in exploring themes such as 'identity' and 'memory'. The implicit model here is that of the avant-garde multimedia artwork, although (here again) students tend to 'import' elements of popular culture. This work can also involve an element of critical reflection, particularly where it involves communication with a wider audience. Rebecca Sinker (1999), for example, describes an online multimedia project which set out to develop links between an infant school and its community. The project was intended to mark the school's centenary, and to offer the children opportunities 'to investigate their own families, community, histories and experiences, exploring changes and celebrating diversity'. Using multimedia authoring software, the project brought together photography, video, drawing, storytelling, digital imaging, sound and text. Although outside experts were involved, the style of learning here was quite collaborative; and the control afforded by the technology encouraged a degree of critical reflection that might have been harder to achieve in other art forms. Perhaps most significantly, the results of the project (in the form of a website) were available to a much wider audience than would normally have been the case with children's work.

Nevertheless, there are two factors that distinguish the use of digital production in the context of media education from these other approaches. Media education is generally characterised by an explicit focus on popular culture – or at least on engaging with students' everyday experiences of digital media, rather than attempting to impose an alien 'artistic' or 'educational' practice. In the case of the Internet, this means recognising that most young people's uses of the medium are not primarily 'educational', at least in the narrow sense: they are about pursuing hobbies, sports and leisure interests, chatting and exchanging instant messages with friends, playing games, shopping and downloading pop music and movies. Above all, teachers need to recognise that young people's uses of the Internet are intimately connected with their other media enthusiasms – for soap operas, computer games, reality television shows and pop celebrities – and that this is bound to be reflected in the texts they produce.

Secondly, there is the element of theoretical reflection – the dynamic relationship between making and critical understanding that is crucial to the development of 'critical literacy'. In the context of media education, the aim is not primarily to develop technical skills, or to promote 'self-expression', but to encourage a more systematic understanding of how the media operate, and hence to promote more reflective ways of using them. In this latter respect, media education directly challenges the instrumental use of technology as a transparent or neutral 'teaching aid'.

The Meanings of 'Access'

At the same time, it is important to recognise the continuing existence of a 'digital divide' in young people's access to technology. The gap between the technology rich and the technology poor is apparent at a global level, yet it also persists in many of the apparently 'wired up' regions of the world. Even in highly technological societies, children have very different levels of access to technology, and to the skills that are required to use it. These inequalities are particularly apparent in terms of social class and gender. In the United Kingdom, for example, Livingstone & Bober's (2004) study found that 88% of middle-class children had home Internet access, compared with 61% of working-class children. Socio-economic status is also significant in relation to the *quality* of access at home (defined in terms of factors including the number, age and specification of computers and connection to dial-up or broadband). Historically, researchers have also found that girls have less access to computers, are less interested in them and spend less time using them than boys (e.g. Cupitt & Stockbridge, 1996), although more recent research (e.g. Livingstone & Bober, 2004) suggests that this gender gap may be narrowing as access increases, even if boys continue to express greater confidence in their dealings with technology. Some commentators argue that these gaps between the 'technology rich' and the 'technology poor' will eventually disappear as an inevitable consequence of the diffusion of new media; while others fear a growing polarisation, and

the emergence of a 'media underclass' in which children will be disproportionately represented (Buckingham, 2000).

This issue is still often seen merely in terms of physical access to equipment; but it is also a question of children's orientations towards technology, and the *cultural competencies* they need in order to use it – and, to this extent, it also relates to broader social and cultural differences (Warschauer, 2003). For example, research in the USA suggests that this may be related to ethnicity, as minority children may perceive computing to be a 'white' activity and hence avoid it (Rojas et al, 2000); while other research suggests that gender differences are now much more to do with *purpose* and *content* than with access itself – for example, girls are more inclined than boys to use new media for the purpose of communication (Livingstone & Bovill, 1999), and their tastes in software may also be quite different from those of boys (Cassell & Jenkins, 1998). Here again, it appears that middle-class children have significant advantages, as a result of their parents' greater experience of computers at work and their involvement in other social networks (Facer et al, 2003).

These differences also have important implications in terms of how children take up the opportunity to become producers of new media. Julian Sefton-Green (1999b) describes the consequences of this in developing courses on web design and computer games production in the context of a youth arts project in London. Young people, mainly from impoverished backgrounds, were recruited onto courses in both of these areas, but the differences between the students' prior experiences of the two forms had a significant effect on how both courses developed. In the case of the web design course, the primary problem was the fact that virtually none of the students who attended these courses (in 1998) had ever used the Web before. By contrast, all the students came to the computer games courses with extensive 'consumer' knowledge about games. The students also had a sense of how the games industry worked, and how the course might relate to media production in the real world – although some rather romantically hoped that the course might further their career aspirations. Nevertheless, they generally had a clear understanding of why and how games *as products* were designed and manufactured. By contrast, in the case of the web courses, the students had no clear idea of what professional (or indeed amateur) web producers might do, and only a very general sense that being competent to work in an online medium might have vocational relevance.

This prior knowledge led to very clear differences when it came to encouraging critical discussion, but it also had an influence on what students were able to produce. Neither group of students possessed basic skills in working with production software, but in the case of the web course, they needed to develop skills in using browsers before moving on to devising their own pages and sites. Students tend to imagine only what they know they can actually make; as they become more proficient with the technology, this in turn changes their capacity to imagine new possibilities. This was certainly apparent in the web courses. Given that most students began with limited ideas about the Web itself, it was not surprising that the work they produced was limited in many respects. A further issue here is that – despite claims about the democratic potential of the Web – in reality much of what young people encounter online could be seen as a form of advertising. Non-commercial online culture – particularly that produced by young people themselves – is much harder to find. As a result, the expressive models available to students are few and far between. There was a striking contrast here with the students' work on computer games. Because they knew more about games, they were quick to come up with ideas, sketches and scenarios for their work. They brought in a great deal of material from home and were clearly very motivated. The work they produced here showed a far greater sense of ownership. Although their technical control over the interactive programs was limited, this did not seem to inhibit their imagination.

This study took place several years ago, but it would be false to assume that these differences are necessarily disappearing. Indeed, similar issues were apparent in Ellen Seiter's more recent account of an after-school computer club she ran with disadvantaged Hispanic children in Los Angeles (Seiter, 2005) and in our own research on the uses of digital media by migrant children across Europe (de Block et al, 2005). In the latter study, we found significant differences in terms of access, both between the six European nations involved in the study (with Southern European nations generally having lower levels of access than Northern European ones) and between different ethnic groups: some migrants were actively using new media, not least as a means of sustaining connections with families and friends across the diaspora, although others (particularly

refugees) were significantly disadvantaged in this respect. As this implies, getting 'hands on' experience with digital technology is only the beginning. *Access* needs to be seen not merely in terms of access to technology or to technical skills, but also to *cultural forms of expression and communication*, and it needs to be acknowledged that students' access to (and familiarity with) those cultural forms is itself likely to be quite variable. These issues could certainly be addressed more directly by researchers in comparative and international education – not least because they have challenging implications in terms of how we teach, particularly in settings that are culturally and socially diverse.

Technology and Pedagogy: the role of school

At least in principle, one could argue that digital production is part of a more general 'empowerment' of media users. By offering greater democratic access to complex forms of media production, digital technology can enable students to become writers as well as readers of visual and audio-visual media – and indeed, begins to blur these settled distinctions. School could play an important role in terms of broadening access to technology, particularly among disadvantaged groups, although there is a need for some caution in this respect. Research suggests that there is a danger of what Attewell & Battle (1999) call a '*Sesame Street* effect' here: that is, an intervention designed to enable poorer children to 'catch up' educationally with their more affluent counterparts may end up widening existing inequalities based on social class, ethnicity and gender, since it is boys, middle-class children and whites (who enjoy greater access outside school) who are likely to benefit most from it.

Yet even where young people do have access to digital production technology in their homes, research suggests that relatively few of them are using it in this way (Facer et al, 2003; Livingstone & Bober, 2004). The reasons for this may be partly to do with the difficulty of acquiring the relevant skills, although they are also, crucially, to do with the social context. Our research in this area suggested that, in most cases, the home context did not provide children with sufficient social motivation to want to engage in such activities in the first place, even where they had the necessary access (Sefton-Green & Buckingham, 1996).

The social setting of the school would seem to provide important opportunities in this respect, although this will depend upon the pedagogy that is adopted. For example, it seems particularly important to insist on the need for *collaboration* in digital production. In the era of analogue technology, media education tended to rely on group work, not just for pragmatic reasons (to do with the shortage of technology), but also for educational ones. These arguments do not easily apply to production work with digital media. Indeed, the use of digital technology often tends to *individualise* the process of production. A computer room, even one set up for creative artwork, tends to involve students working individually at screens, and the teacher often has a more one-to-one relationship with individuals – although students may also work together as peer-tutors, especially to solve software problems. Attempts to build in group work often appear somewhat artificial, and students will sometimes seek to avoid dialogue and debate by dividing their labour into specialised functions that can be taken on by individuals. Particularly where there is a high level of access to the technology, the benefits of working together need to be made explicit and actively promoted. Group work provides important opportunities for reflection, deliberation and dialogue; and it is only through these processes that connections can be made between hands-on practice and the broader conceptual concerns of media education.

Finally, there is the question of audience. Most of the creative work that students undertake in school is designed for an audience of one: the teacher-as-examiner. The existence, or even the potential existence, of a real audience can qualitatively change how students conceptualise production work, and what they learn from it (Buckingham et al, 1995). The Internet provides – or may in future provide – significant opportunities for young people's work to find a wider audience. There is now a growing number of sites that feature images, video and audio material produced by young people. Nevertheless, it would be wrong to overstate this. The task of bringing students' work to the point of 'publication' is often quite time-consuming, and the work often looks and feels very different from 'professional' products. In reality, few schools have published their students' multimedia work, or made it more generally available via the Internet, although this probably

reflects schools' growing concerns about their 'public image'. Of course, finding an audience – even a relatively small and local one – is just a stage in the process, rather than an end point; but, if seen in this way, it can have significant benefits in terms of students' motivation and their willingness to reflect upon their work.

As this implies, the value of digital technology depends to a large extent on the *pedagogic* relationships that are established around it – for example, on how students are given access to the skills and competencies they need, how far they can control the process, and how far they can enter into a dialogue with their peers and teachers. It also depends, more broadly, on the *social* contexts that surround it – on the motivations of the students, on the ways in which cultural production relates to other aspects of their lives, on the audience for their productions, and so on. In all these respects, I would argue that the school has an absolutely vital role to play.

Conclusion

The kind of work I have been discussing here is already well developed in many schools, and in some informal, out-of-school settings as well, and this has been the focus of a good deal of research at our research centre over the past 10 years.[1] Of course, significant difficulties and challenges remain. As in any other area of education, there is both good and bad practice in media education; and there is a great deal more we need to know about its effectiveness and its limitations. In particular, we need to know more about how schools can redress the inequalities in access between different social and cultural groups – again, not merely in terms of physical access to equipment, but also in terms of relevant cultural capital.

Ultimately, however, my argument is much broader than simply a call for media education. The metaphor of literacy – while not without its problems – provides one means of imagining a more coherent, and more ambitious, approach. The increasing convergence of contemporary media means that we need to be addressing the skills and competencies – the multiple literacies – that are required by the whole range of contemporary forms of communication. Rather than simply adding media or digital literacy to the curriculum menu, or hiving off 'information and communication technology' into a separate subject, we need a much broader reconceptualisation of what we mean by literacy in a world that is increasingly dominated by electronic media. This is not by any means to suggest that verbal literacy is no longer relevant, or that books should be discarded. However, it is to imply that the curriculum can no longer be confined to a narrow conception of literacy that is defined solely in terms of the medium of print.

This approach to digital literacy also provides a more compelling rationale for the use of technology in education. Most uses of computers in schools signally fail to engage with the complex technological and media-saturated environment in which children are now growing up. For the most part, they are narrowly defined, mechanical and unimaginative. The answer to this problem is not to import ever more fashionable or 'child-friendly' devices, or to sugar the pill of learning with a superficial dose of digital entertainment. Digital media literacy represents a more rigorous – but also more enjoyable and motivating – way of addressing the educational challenges of the digital age.

Note

[1] See <http://www.childrenyouthandmediacentre.co.uk>

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