
Images of literacy in reference CD-ROMs and search websites for children

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Abstract

In the technologised society, the new information and communication technologies (ICTs) are becoming one of the main areas and tools of literacy activity. ICTs are also becoming one of the active 'participants' of literacy education. In the present paper, I discuss my ongoing doctoral research into the discursive construction of the child as a literate subject in reference CD-ROMs, online encyclopedias and search websites for children.

My research is driven by a number of questions: What notions of literacy are offered to the child user of ICT-based educational products? Whose literacy practices are represented as universal by their producers? Who may and may not benefit from technology-mediated literacy education? How is the child user of ICTs constructed as a literate, social and cultural subject and who is excluded by these constructions?

I am conducting my study within the approaches of social semiotics and discourse analysis. My objects of analysis are both verbal texts and images. Here, I will focus on images as 'participants' in the construction of the notions of literacy and on what the images of literacy in reference CD-ROMs imply about their users as literate, social and cultural subjects.

Literacy in technologised society

Literacy researchers agree that ICT has dramatically changed literacy practices as well as the very idea of being a literate member of society (Cope & Kalantzis 2000; Lankshear et al 1997a; New London Group 1996; Queensland Government 2000; Snyder 1997, 2000). An overview of the most recent works on the purposes of literacy education in the New Times demonstrates that there is a call for educators to develop a 'multidimensional' vision of the new technology-mediated literacy - a vision that includes its operational, cultural and critical aspects. This vision is needed in order to provide the literacy education required for members of society to

become actively involved with the higher kinds of technology-mediated symbolic activity (Gee 2000; Kress 2000a, 2000b; Lankshear et al 1997b).

The attention of some literacy educators has been attracted to those groups of students who are threatened with marginalisation in relation to the kind of literacy required in an information-based society (Bruce 1999; Downes 1997; Comber & Green 1999a, 1999b; Queensland Government 2000). It is, however, possible to point out some educational projects and programs that aim to account for the diversity of students and communities. These programs also aim to translate the skills, knowledges and practices used by the children in their communities and homes into outcomes that will enhance their opportunities and broaden their life pathways.

However, in the technologised society, ICTs are not only changing what counts as literacy; they are also changing who determines what counts as literacy and where and how literacy education takes place. The attention of literacy educators has been attracted to the issue of the 'Nintendo generation' as having literacy experiences different to their teachers and parents (Green et al 1998). Literacy researchers argue that the computerisation of the home as well as the early engagement of children with digital culture has resulted in the formation of significant differences and gaps between school literacies and the use of technology in the school setting and those technology-mediated literacies and uses of technology available to children outside the school setting. Many literacy educators and researchers have become conscious of the fact that

the world is changing all around us, and that our students, our children, are arguably already living and learning in the future, although not necessarily in the context of the nation's classrooms. (Green & Beavis 1998, p i)

One of the characteristic features of the technologised society is that the range of educational 'stakeholders' includes not only governments, teachers and parents but also the producers of educational technology-based products (Bigum & Green 1993; Kenway 1995; Luke 2000). As Carmen Luke (2000, p 71) argues, corporate experts already play a significant role in determining 'how people will learn, what they learn, and what constitutes literacy' in the technologised society. This role is becoming more significant due to the increasing technologisation of the home and the growing domestic use of computer and related technologies for educational purposes (Australian Bureau of Statistics 1998; Downes 1998; Kenway & Bigum 1996).

The issue is no longer who may and may not play the role of the 'literacy authority', but what are the social and cultural implications of the appearance of new 'education providers' and 'literacy authorities'? As Burbules and Callister (2000, p 16) argue, it is necessary to understand ICTs' 'specific benefits for particular kinds of learners; their impact on access and equity issues for learners who do not benefit from them; and so on'. To achieve this understanding, ICT should be approached not as a 'tool' used by the literate subject, but as a 'context and resource' (Bigum & Green 1995) used to change the literate subject:

... IT needs also to be understood as decidedly 'non-neutral', in both respects, in the sense that it is inevitably transformative, amplifying, emphasising and enabling certain possibilities and reducing or shifting the focus away from others. This is as true at the level of the classroom and the school as it is of larger, more inclusive social formations. Appropriate social and educational assessments of the application of new technologies need therefore for such factors to be reckoned explicitly into account. (Comber & Green 1999a, p 38)

In my present research, I suggest that one of the ways to assess the ICT as a 'context and resource' used to change the literate subject is to study the notions of literacy offered to the child user of a range of particular ICT-based educational products. I also suggest that one of the ways to assess the possible impact of ICTs in terms of access and equity of literacy education is to study how the child user is constructed in these products as a literate, social and cultural subject.

ICT products and the user

My research is focused on a range of ICT-based products designed mainly for use at home for educational (school-related) purposes. The corpus includes:

- search websites for children (eg Yahoo!igans - the web guide for kids; Ask Jeeves for kids);
- free online encyclopedias (eg Encyclopedia.com); and
- multimedia reference CD-ROMs (eg Maximedia Australian CD-ROM and Home reference library school projects series; Webster's encyclopedia of Australia 2000; Multimedia Animals Encyclopedia; Hutchinson multimedia encyclopedia).

Why make CD-ROMs, online encyclopedias and search websites the objects in an investigation of the effect of ICTs on the subjectivities and identities of children? Indeed, they seem so 'plain' in comparison to computer simulations, role-playing games, software for the creation of music or animation and networked communities: the usual focus of sociocultural and postmodernist studies on the transforming effects of technology (Johnson-Eilola 1997; Jones 1995, 1998; Star 1995; Turkle 1995). However, as Carmen Luke notes in her recent paper, ideology and power are working through these seemingly neutral CD-ROM encyclopedias:

For instance, a quick look through any of today's most popular CD-ROM encyclopedias (for example, Microsoft *Encarta*) shows how limited entries on, for example, 'Australia' or 'Aborigines' are; how ideas are connected by lateral links and pathways which exclude other knowledge options; and how the software in fact 'teaches' the user-learner certain cognitive mapping strategies. Many of these bestselling American-authored encyclopedias are in use in Australian schools and households. But even Australian-authored educational CD-ROMs reproduce the same old tired narratives on, for instance, bushrangers framed in mythologies of settlement instead of invasion. (Luke 2000, p 71)

Thus, according to Carmen Luke, CD-ROM encyclopedias do not just function as neutral sources of information, but perform a kind of public pedagogy in

the same way as traditional media do (Giroux 1994; Kellner 1995; Luke 1996). They achieve certain educational and pedagogical effects by providing the user with constructions of reality, social identities and values.

The present paper suggests that CD-ROM encyclopedias deserve particular attention as they provide the user with constructions of literacy. There is empirical data on children's use of these kinds of ICT that provide sufficient ground for questioning them as a source of the notion of literacy. For example, according to the study recently conducted in Australia by Toni Downes (1998), children use images from reference CD-ROMs and the Internet mainly for the purposes of designing and decorating a page rather than to add meaning to the overall text. In her study, Downes (1998, p 216) observed a common pattern in the use of images:

Many children also illustrated or decorated school-related texts. Again within these purposeful work-related tasks there were periods of playful activity as children fiddled with borders, backgrounds, fonts, clip art or photographic images. Working with images generally involved 'cutting' and 'pasting' or inserting ready made pictures into their document. It was rare for children to use self-constructed images. There was an overwhelming reliance on clip art and images downloaded from CD-ROM encyclopedias or the Internet. Often clip art and pictures were used even when inappropriate for the text. In fact, the children who spoke about using clip art in projects did not seem to worry about the appropriateness of the image.

Data of this kind raises the question: where might this pattern of literacy activity come from? A lot of factors may influence this, probably including a child's school, social and cultural background, age and gender (Furlong et al 2000). However, surely we should consider if technology, in itself, is one of these factors, and how technology might impose this pattern by suggesting to a child user particular notions of what it means, for example, to create a school project.

So far, reference CD-ROM encyclopedias have not yet been the specific object of such examination. Meanwhile, reference CD-ROMs are introduced not just as a source of information and a tool for creating a school project, but also as a 'participant' of this activity. For example, the text on the CD case of *The encyclopedia of great artists* possesses the following recommendation to the potential consumer:

Great Artists ... is the friendly, likeable teacher who loves their subject and has a genuine desire to share it with you.

Similarly, *Webster's encyclopedia of Australia 2000* is advertised with the following text (the orthography is kept intact):

This CD-ROM contains an exciting collection of intriguing Australian information. It will keep you busy for a long time and is a great "homework helper" for those school projects. It even has it own inbuilt Project Creator!

Reference CD-ROMs may also 'teach' the user how to search for information, to create a project, etc. For example, the text displayed on a back cover of a booklet attached to *Maximedia school project no 1 CD-ROM* informs the user

about the sources necessary for creating a school project as well as the process itself. The text reads:

YOUR COMPLETE PROJECT CREATION KIT!

My School Project

Over 1000 images – simply drag-and-drop onto your page! PLUS a huge library of information to cut, paste and rewrite to create your project

Five easy steps to a great school project

Step 1: Create headings and borders in your wordprocessor.

Step 2: Use powerful search engines to quickly scan through thousands of images and articles on this CD-ROM.

Step 3: Drag, drop and resize the pictures you want.

Step 4: Cut, paste and rewrite information.

Step 5: Print your project in black-and-white or colour!

The text on the booklet informs the user that there are two different kinds of sources that may be used in *School project*. These sources are images (pictures) and information: 'Over 1000 images PLUS a huge library of information'. Does this formula mean that the images are the main element of the project to which information is 'added'; that images are not capable of adding meaning to the information represented verbally? This may be the case, taking into account that operations with images are represented as a material rather than a mental process: 'simply drag-and-drop'; 'drag, drop and resize the pictures you want'. After reading this instruction, one can be hardly surprised by the fact that many children use images from CD-ROM encyclopedias in the way described by Downes (1998).

The producers of reference CD-ROMs include instructions with their products of how to perform certain literacy activities to the widest possible audience. They advertise these products as designed for use by everybody, everywhere:

Great reference tool for every home! (*Who did what in Australia. Australian home reference library CD-ROM*)

Every important event in our history since 1788 is chronicled in this major reference work, making it an essential resource for every Australian home. Students and parents, in particular, will find this CD-ROM invaluable for homework and school projects. (*What happened when in Australia. Australian home reference library CD-ROM*)

This ultimate reference library for your home, your family, and your office! (*Hutchinson multimedia encyclopedia CD-ROM*)

Webster's Concise Interactive Encyclopedia is packed with valuable information for the entire family. (*Webster's concise interactive encyclopedia CD-ROM*)

The producers' intention to reach everybody is not just a claim - it is 'supported financially'; many of these products are offered free (like online encyclopedias) or at very reasonable prices.

I am basing my present research on the idea that these 'homework helpers' - addressed to the widest possible audience and promising instant success for everybody ('Instantly create great school projects - it's as easy as click and paste!') - should be analysed using the following questions:

- What notions of literacy do they bring to the user?
- How do these notions correlate with the notion of 'literacy for the New Times' (the kind of literacy believed necessary to access the higher kinds of symbolic work and be an active and critical member of society)?
- Can everyone benefit from the notions of literacy provided by the producers of reference CD-ROMs and creators of search websites for children?
- Who exactly is the addressee of these products; how is the child user constructed as a literate, social and cultural subject?
- Who is excluded by these constructions?

I aim to address these questions through critical analysis of the discourses of literacy, pedagogy and culture drawn together by these educational products.

A number of researchers have recommended conducting discursive and textual studies of the constructions of subjectivity and identity in multimedia interactive texts via analysis of narratives, interfaces, hypertextual links and interactive structures (Alloway & Gilbert 1997; Burbules 1997; Fuller & Jenkins 1995; Johnson-Eilola 1997; Peters & Lankshear 1996). Here, I will focus my discussion mainly on images – the characteristic features of multimedia CD-ROMs and websites.

The image as an object of literacy research

My choice of images as the object of my study of the construction of the child as a literate subject makes sense in the context of the more general theoretical debate about the recent communicative shift from the linguistic to the multimedia mode of

representation (Kress 1997, 1999, 2000b). Kress and Van Leeuwen (1990) argue that due to this shift, the visual image is becoming one of the most significant factors of cultural influence on children and adults alike. This influence stems from the fact that visual images - like verbal texts - are socially and culturally determined conceptualisations of the reality being represented.

According to Kress and Van Leeuwen (1990, p 73), for example, there are images which tell their viewer something about 'the more or less timeless, stable and constant (visible) essence' of represented objects. They teach their viewer what things are like, what the order of things is. Also, there are images that 'show how participants relate to each other in a given, specific instance and from one of many possible points of view. They deal with actions and events, rather than with a fixed and constant spatial order' (Kress & Van Leeuwen 1990, pp 73-74).

Apart from constructing reality, images also construct the viewer in relation to power and social status. For example, the viewer may be constructed as an active subject or a passive object, belonging either to 'us' or to 'them'. Kress and Van Leeuwen argue that it is therefore essential for educators to be able to understand images as providing particular - and partial - constructions of the reality and the viewer.

I have designed my present research as an application of this general purpose to study the kind of images that may affect the formation of the literate subject. Children encounter these kinds of images in the process of using CD-ROMs or the Internet. These images are amongst icons and graphic symbols in toolbars, menus and webpages as well as in the visualised descriptions of the capabilities of software and the instructions addressed to the user. The function of these images is to tell the user how the article, document or the entire software may be consumed; in what literacy activities each can be involved. In my discussion here, I intend to demonstrate that these images can be approached not just as 'neutral' graphic symbols of various literacy-related activities, but as representations of particular social- and cultural-specific notions of these literacy activities. I later refer to these images as the images of literacy.

I have adopted the term 'images of literacy' from Hamilton (1999), who has applied the Kress and Van Leeuwen approach to the study of literacy as a social practice. The concept of literacy as a social practice emphasises the social relationships and institutions within which literacy is embedded (Gee 1990, 1992; Street 1984, 1995). Having traced the threads of literacy practices throughout contemporary social life, using visual evidence such as newspaper photographs of literacy events, Hamilton (1999) has concluded that these should not be approached as 'neutral' evidence nor as 'documents' of literacy events, but as a socially contextualised way of channelling literacy-related values. Therefore, Hamilton (1999) argues, studying the media images of literacy is a way to study public discourses of literacy and to understand how these can be criticised. This is possible because the media photographs are socially salient, public representations of literacy practices created by photojournalists and editors as a part of constructing newsworthy messages and meanings.

As Hamilton (1999) argues, conceptualisations related to literacy practices are the non-visible constituents of literacy events and may only be inferred from photographs. Therefore, the same elements shown in the photographs - participants, settings, artefacts - may be considered as elements of literacy events or practices. Defined in terms of physical observation, they are the elements of literacy events. Defined in terms of 'folk models of those events and the ideological preconceptions that underpin them' (Street 1995, p 2), they are the elements of literacy practices.

Hamilton suggests these different elements may be interpreted as providing data about the different aspects of literacy practice. Thus, the following images can be interpreted in terms of:

- participants - social relationships of producing, interpreting, circulating and regulating texts;
- settings - sense and social purpose of a literacy event;
- artefacts - non-material values, understandings, ways of thinking, feeling, skills and knowledge; and
- activities - structured routines that regulate actions, as well as the rules of appropriateness and eligibility.

I am suggesting here that the above approach may be used to study the images of literacy in reference CD-ROMs, online encyclopedias and search websites, as some of these images can be considered public representations of literacy practices. This is because these images are produced within certain institutional settings and are a part of the meaningful message that the creators of CD-ROMs and search websites address to the user. This message is based on certain assumptions about literacy practices, their value and essence. From this point of view, the images of literacy used in reference CD-ROMs and search websites can be considered to play the same role as the newspaper images of literacy studied by Hamilton (1999) - ie a way to channel literacy-related notions and values.

Images of literacy: what (or whose) literacy is it?

In reference CD-ROMs and search websites, the majority of images are of literacy artefacts. These are mostly images of reading and writing surfaces, tools and accessories such as books, maps, computer screens, folders, diskettes, sheets of paper, book pages, pens, quills, printers, compact disks, etc. For example, the toolbar of Encyclopedia Australia 2000 CD-ROM contains 12 icons. The following images have been used by the creators of the CD-ROM as icons of available literacy activities:

- sheets of paper = 'Print menu' option
- a page = 'Page layout' option

- a metallic pen = 'Add your own notes' option
- a compass = 'Create your own project' option
- scissors = 'Edit' menu.

Kress and Van Leeuwen (1990) argue that images create represented objects by emphasising some aspects of these objects' that silence or hide others. For example, the choice of the scissors image may indicate that the essence of the literacy practice of editing is 'cutting' the text. The choice of scissors to represent editing encourages understanding this activity as a work at the materiality of text rather than at its meaning. From my personal experience of editing, an image of a blue or red pen would be a more appropriate symbol of editing rather than scissors; scissors as an editing tool seem 'rough'. The compass image also seems an interesting choice for the 'create your own project' option in the CD-ROM encyclopedia introduced to the user as a 'helper' in 'those school projects'. This image - of an instrument used for drawing circles, measuring distances on a map or chart, etc - refers more to the activity of creating a project in a technical field such as engineering, than to the idea of creating school projects usually set out as written assignments.

The images of literacy artefacts in reference CD-ROMs and search websites for children may also bring to the child user particular ideas of the place and function of different literacy technologies in contemporary life. For example, the page of *Yahooligans! The web guide for kids* contains six icons:

- a Globe - used for the topic 'Around the World', which provides links to information on countries, food, holidays;
- a TV set with a musical note on the screen - used for 'Art & Entertainment', eg TV, movies, jokes, music;
- a smiling diskette - used for 'Computers & Games', eg games, web, screensavers;
- a book with an apple - used for 'School Bell', eg language, arts, maths, social studies;
- a magnifying glass and a butterfly – used for 'Science & Nature', eg space, animals, dinosaurs; and
- sport boots - used for 'Sports & Recreation', eg baseball, outdoors, wrestling.

It is possible to interpret these images in terms of the construction of the child user of the present *Web guide* as a literate subject. It is also possible to suggest, for example, that the child user is constructed as someone who is surrounded by different kinds of information and communication technologies: the traditional

(book) and the 'new' (TV set, computer diskette). The 'new' technologies are associated with entertainment and games, while the traditional literacy technologies are associated with schooling. The image of a book as an icon for the topic 'School bell' brings to the user the idea of printed literacy and books as belonging to the field of school-related activities rather than to the field of leisure and recreation activity. This image also possibly suggests schooling is primarily connected with the traditional - print - literacy.

Apart from these literacy artefacts, the user of reference CD-ROMs encounters images of literacy activities. Although there is no animated participant, the activity is nevertheless depicted in these images. Documents, screens, images and interfaces are shown as interacting and changing by means of arrows, sequential arrangement, etc. The creators of reference CD-ROMs use the visualisation of literacy activities quite often. How may the choice of visual means as a way of telling the user about available literacy activities affect the notion of these activities?

A back cover of the booklet attached to the *Maximedia school project no 1 CD-ROM* instructs the user how to create a school project. Earlier in the paper, I have shown that the process of project creation is represented in this instruction as one that involves operations with two kinds of sources - images and information. Operations with images are represented in the instruction as material rather than mental processes (drag, drop, resize), while operations with verbal information are represented as activity of a less material (and mechanical) nature. At least, an activity such as rewriting is mentioned as a stage of the fourth 'easy step to a great school project': 'Cut, paste and rewrite information'. However, the possible effect of having mentioned the rewriting may be significantly reduced due to the fact that the process of the creation of a project is not only described verbally but shown visually.

Visually, creation of a project is represented as a set of images of smaller screens arranged symmetrically on both sides of an image of a larger screen. Parts of texts and pictures on lateral screens are highlighted and arrows show that they have been transferred to the central screen which, in turn, shows the ready project page. This visual representation of the process of the creation of a project is the most dominating and illustrative part of the instruction. As every mode of representation/communication, the visual mode has its advantages as well as limitations. A visual image may be a good means to represent such operations as drag-and-drop or cut-and-paste, but rewriting is difficult to represent visually. That is, the very fact that visual images are employed by the creators of a given CD-ROM to tell students how to use their products may emphasise the material aspects of the literacy practice identified as 'creation of a school project' and reduce its essence as a process of meaning making.

Visual representation of the activity identified in the CD-ROM as the creation of a project may affect the notion of creativity as well. Generally, the use of visual means of representation brings with it 'a shift from the temporal-sequential logic of spoken (and, to a somewhat lesser extent, written) language to the spatial-simultaneous logic of the visual' (Kress 1999, p 68). In the visual mode, therefore, it is easier to represent the activity of creating a project as a set of simultaneously

existing spaces linked to each other, rather than as a process. It is possible to say that the visual representation of the activity of creating a project gives the user a new notion of creativity - legocreativity. Legocreativity presupposes operations with given, ready-made blocks while the traditional notion of creativity emphasises the sense of movement from non-existing to new (Sefton-Green & Buckingham 1998).

However, the notions of literacy offered to the user of reference CD-ROMs are not always so innovative. The same booklet provides an image identifiable as representing the activity of finding information. This activity is visually represented as a series of four images of a screen, from the main menu to a text of an article. These images are linked with arrows. Thus, the process of a searching for information is represented as a step-by-step movement within a hierarchically organised database structure. According to Johnson-Eilola (1997), the representation of information/knowledge as a linear-hierarchical structure helps to develop modernist rather than postmodernist ways of thinking:

Linear-hierarchical structures offer a tree of knowledge, with each specific bit of knowledge possessing its own proper place within the global system. In other words, linear-hierarchical ordering should connote a sense of place, a modernist universal ordering for knowledge.

(Johnson-Eilola 1997, p 199)

On the other hand, Johnson-Eilola argues, the representation of a database as multiple, overlapping hierarchies - a data cloud (not as a coherent structure) - requires the database user to possess the ability to work within a kind of a chaotic environment. Johnson-Eilola (1997) argues that this ability is necessary in order to work productively in a world of global computer networks. The creators of *Maximedia school project* have chosen an image of sequential movement within a hierarchical structure to represent the database of knowledge as well as the activity identified as finding information. Can it be concluded that they provide the child user with the modernist idea of knowledge and make patterns of information processing (if not thinking) obsolete?

The choice of visual means as a way of informing the user about available literacy activities may not only affect the notion of these activities; it may also act as a mechanism of exclusion of some users. For example, images of literacy used in reference CD-ROM toolbars and menus can be described in terms of the division of literacy technologies into old and new technologies. There are images that refer to the technology of handwriting (quill, ancient map, pen); print (book page); and digital technology (diskette, compact disk). The images of the archaic or exquisite literacy (quill, scroll, fundamental volumes, old maps) occupy a surprisingly significant place amongst the images of literacy artefacts in CD-ROM toolbars and menus.

In the context of the software producers' claims that these products are addressed to everybody, this circumstance deserves particular attention. The use of visual images instead of verbal signs is based on the idea that all users share a conventional understanding of images as symbolic representations of certain meanings. Therefore, images of literacy used in the educational products addressed

to the wide audience should be easily recognisable by their users. Those who do not recognise images (for example, due to the absence of prototypes of these images in their everyday experience) may be disadvantaged by their use.

Images of literacy: what do they imply about the child user?

One of the characteristic features of literacy images in reference CD-ROMs, online encyclopedias and search websites (in comparison to the images of literacy in media - see Hamilton 1999) is the absence of images of people-participants in favour of literacy artefacts and/or literacy activities. However, images of artefacts and activities may imply certain ideas about the identities of people-actors using/producing these artefacts and performing these activities. For example, in the main menu of *Multimedia animals encyclopedia*, an image of three solid encyclopedia-like volumes with golden bindings stands as an icon for an option called 'Bookshelf'. This option provides a link to a glossary containing definitions of such words as 'invertebrate'. The image implies that whenever a child user meets an unknown term, she/he (virtually) can stretch the hand to the bookshelf, pick up an encyclopedia or a dictionary and find out what the term means.

This image may be also considered as selective. It may be looked upon as an image of a particular literacy setting characterised by the availability of expensive books used as fundamental, authoritative sources of information. Books of such appearance (with golden bindings) don't exist in every library, let alone every household. That is, the image of this particular literacy setting may presume or create a certain identity of the user - as a person who has access to such literacy artefacts and a particular literacy culture. Turning to a bookshelf upon meeting an unknown word is an action developed within a rather distinct, refined literacy culture. It is possible to expect that this menu option will be used by a child becoming literate in this (bookish, high) literacy culture rather than within a Nintendo technoculture.

I do not completely share the scepticism of a well-known computer heretic Clifford Stoll, who has written the following about the perspectives of the Nintendo generation:

In 1993, Al Gore said, "In the next decade it will be possible for an elementary school student to come home after class and instead of playing Nintendo, plug into the Library of Congress and explore an entire universe of information".

Yep, kids of 2003 will be able to see the catalog of the Library of Congress. But they won't want to. They'll still play Nintendo, watch TV, and when they are on-line, visit the MTV home page. They sure won't be clustered around their terminals merrily plugged into the Library of Congress.

(Stoll 1999, p 115)

I am more inclined to share the ideas of educators who believe that new technology-mediated literacy practices are able to provide wide opportunities for a more enhancing literacy education - eg that it is possible to make computer games a field where complex literacy strategies and notions can be used and developed (see Beavis 2000). Perhaps using the image of a bookshelf will give the 'Nintendo child'

an idea of the existence of such sources of knowledge as printed books and such literacy activity as consulting a book whenever an unknown word is met (luckily, children are capable of learning creatively). At the moment, however, my purpose is simply to show that menu icons in reference CD-ROMs may be rather selective in terms of what they imply about the child-user as a literate and cultural subject.

Specifically, the image considered above constructs the user of this multimedia encyclopedia as someone who belongs to the high literacy culture - that of traditional print. Using a bookshelf image as an icon for the operation of finding the meaning of an unknown word might tell more about the capabilities of the given CD-ROM to one child who belongs to this culture, but the choice may disadvantage another.

Conclusion

Images of literacy in reference CD-ROMs, online encyclopedias and search websites can be approached as channels through which the discourses of literacy and pedagogy work at constructing children as literate subjects. As I have demonstrated, the visual means of representation used by the creators of these products to inform and instruct the user may affect notions of represented literacy activities. Consideration of the essence and value of the different notions of literacy offered to a child user of these products is beyond the scope of my discussion here. Instead, I have focused only on demonstrating that images - seemingly designed as pure 'illustrations' of how to operate these products - may also bring with them particular notions of these practices, hence participating in the formation of the literate subject.

Images of literacy in search websites and reference CD-ROMs can also be seen as constructing the child user as a social and cultural subject. Through my analysis of how the user is constructed in reference CD-ROMs, as implied in the images of literacy, I have shown that these products - seemingly addressing a universal audience - actually address a selected type of user. These products thus bring additional benefits to some and enhance their learning, while disadvantaging or excluding others.

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