

HYPERMEDIA, INTERNET COMMUNICATION, AND THE CHALLENGE OF REDEFINING LITERACY IN THE ELECTRONIC AGE

Cameron Richards

National Institute of Education, Nanyang Technological University, Singapore.

ABSTRACT

This paper argues that the dominant hypermedia models of electronic literacy are too limited to do justice to new media and changing views of literacy in the electronic age, especially in terms of their recourse to postmodern theories of representation. Such models tend to interpret the use of digital media in relation to readers or users of information viewed as producers or constructors of their own meaning and identity (e.g., Bolter & Grusin, 1999; Landow, 1992; Poster, 1995). Such a perspective on the move from print to electronic literacy generally does not distinguish between the literal intention of an author or designer and a rhetorical strategy which frames and elicits responses by an audience or the "receivers" of communication, in short, a view of electronic media as ultimately a source of contingent or accidental meaning and discrete texts of information. A critique will be made of the limitations and contradictions of a general hypermedia perspective as a basis for engaging with and going beyond--not rejecting or denying--the often innovative and useful contributions of hypermedia theorists to seek a more integrated, relevant, and grounded theory of electronic literacy in terms of a communications approach. This article thus attempts to practice as well as reflect the kind of "dialogical" approach to knowledge and human interaction advocated by Ricoeur when, for instance, challenging Derrida's poststructuralist delineation of writing and speaking as separate systems of communication (Ricoeur, 1976, 1978)--Derrida being one of the key references for a general hypermedia perspective. On this basis, it suggests that a "rhetoric of design" is perhaps a missing link providing a convergent focus for developing further an inclusive framework of electronic literacy which incorporates Internet communication as well as hypertext and interactive multimedia.

INTRODUCTION: THE CONFLICT OF PARADIGMS FOR EMERGENT NOTIONS OF "ELECTRONIC LITERACY"

The new electronic media of multimedia interfaces and networked computers have provoked much discussion about literacy and cultural transformations comparable to those effected by the printing press (e.g., Birkerts, 1994; Nunberg, 1996). However, in the same way that the term *literacy* may be interpreted as fundamentally either a language process mediating information or one of interactive communication, so too, the Internet may be perceived to represent either an information or communications revolution. Just as emergent popular representations of the Internet were typified by an "information superhighway" metaphor, so too, academic references have tended to focus on the informational uses of the Internet as a great database (Poster, 1995; Roszak, 1994). The facility of the Internet for human communication tended to be seen as secondary and even frivolous--in part because the early synchronous Internet communication programs were mainly for purposes of role-playing games and social chat (e.g., Reid, 1996; Rheingold, 1994). However, as more sophisticated uses of Internet communication were developed in the 1990s for purposes of education, e-commerce, and everyday communication, there was an increased general recognition that informational uses of new electronic media or telecommunications ever involve processes of interaction, communication, and even human community (Castells, 1996; Pavlik, 1998). This is evidenced by how the previously dominant generic

term for interactive electronic media, *Information Technology* (or simply *IT*), is now increasingly being replaced by *Information and Communications Technologies (ICTs)* and even *Communication and Information Technologies (CITs)*.

Extending the concept of "hypertext" to include electronic multimedia effects such as digitized sounds and images, hypermedia models of electronic literacy also began emerging in the 1980s in part as an optimistic riposte to pessimistic projections about the effect of computers, information technology, and electronic media generally on a younger generation (Birkerts, 1994; Postman, 1992; Roszak, 1994). For instance, Richard Lanham's (1993) notions of hypertext directly responded to Neil Postman's (1992) pessimistic notion that new electronic literacies represent a corruption of the typographic mind and an extension of the insidious influences of popular American television culture: new generations of youth growing up as passive consumers of media, and lacking the senses of interiority, depth, and memory held to be a function of print literacy. From the beginning, proponents of the hypermedia model of electronic literacy saw a natural affinity between this model and postmodern theory in general, and the poststructuralist literary and language theories of Derrida in particular. Following Derrida, the networked links of hypertext were seen to be defined in opposition to principles of hierarchy, sequence, and autonomous meanings (Landow, 1992, pp. 8-26). Similarly, the concept of hypermedia reflected the increasing importance of nonverbal signs, and especially electronic images, in the changing semiotic systems of human communication (Bolter, 1991a, pp. 195-206). Thus, the hypermedia model of electronic literacy also represents a range of aesthetic, critical, and subjective agendas which ostensibly counter a narrow "information technology" focus on both data and technological skills in a vacuum. Nevertheless, as suggested by the use of postmodernist frameworks which prefer to focus on images, signs, and representational forms per se rather than actual dialogue or interaction in context, it remains ultimately framed by an *informational* rather than *communications* context for interpreting the literacy, language, and cultural implications of the new electronic media.

This paper will argue that hypermedia models of interaction with, and communication of, information may be innovative and useful in many respects, but tend to be too narrow, too selective, and too self-contradictory in terms of their recourse to postmodern theories of representation to do justice to the concept of "electronic literacy." It will suggest that a general hypermedia framework inadvertently reinforces some of the very traditional print paradigms of disembodied or abstract knowledge and privileged education which it tends to set up as its critical "other." But instead of merely rejecting this framework, the discussion below incorporates it as an important and even crucial platform for a more integrated and relevant theory of electronic literacy in terms of a move from viewing both literacy and electronic media in the context of a communications rather than informational perspective. A communications perspective, it will be suggested, offers a potentially more useful framework for interpreting and accounting for the various implications and uses of Internet "hybridity" encapsulated by both hypertext and hypermedia--in particular, the blurring of relations between reading and writing, and between verbal and visual media of textuality. In terms of a transition from text-based uses of the Internet to graphic and multi-media interfaces, the challenge of developing a more relevant generic typology of Internet communication provides an exemplary focus for articulating a communications framework for electronic literacy and learning in general. Like the hypertext theorists, proponents of Internet communication have usefully challenged those critics who see the Internet and related digital media as inherently alienating and superficial (Johnson, 1997; Turkle, 1996). However, while the hypermedia framework tends to rationalize Internet communication as a sort of secondary or add-on feature of the Internet, often ignoring the "interactive" functions of virtual community and electronic dialogue, this article will further argue that a communications model also incorporates the concepts and functions of hypertext and other aspects or functions of information technology.

THE LIMITATIONS AND CONTRADICTIONS OF HYPERMEDIA MODELS: A BASIS FOR DEVELOPING NEW AND MORE INTEGRATED FRAMEWORKS OF ELECTRONIC LITERACY

As a way of talking generally about new electronic media, the concepts of hypertext and hypermedia need to be exposed as too limited or exclusive--and also contradictory--because they tend to involve sliding definitions and readily allow inappropriate applications. In other words, although initially defined and applied in relation to associated concepts of information units or bits, a logic of association, and a rhetoric of the image, such views and related terms have inevitably been used to discuss general media and specific tools of interaction and communication as if merely secondary or add-on aspects of the use of information technology, rather than the reverse. Thus, although often referred to as a "new" perspective in contrast to "old" modes of literacy and knowledge, like the concept of "postmodernism" the general hypermedia framework does not adequately provide a context for distinguishing different and also self-contradictory agendas, perspectives, and rationalizations for human communication and knowledge. Put another way, some of the most ardent enthusiasts of new modes of literacy and learning in the electronic age are perhaps still reinforcing the very "industrial age" assumptions, logic, and, most importantly, practices they purport to reject or go beyond. For instance, educational policy-makers and administrators who enthusiastically advocate on-line and "flexible" modes of teaching and learning for commercial or opportunistic reasons often fail to realize the support and strategies needed for CITs to be integrated rather than mere add-ons in education--because their starting point is a traditional "transmission" view that education is basically about the transfer of information (e.g., Healy, 1999; Oppenheimer, 1997). The greatest failure of the hypermedia framework has been its inability to provide a balanced context for dialogue or discussion about the opportunities and limitations of new electronic media and technologies. This is typified by the uncritical polarization between optimistic and pessimistic perspectives.

In his response to Neil Postman's pessimistic dismissal of electronic literacy, Lanham (1993, pp. 243-246) argued that the paradigm of electronic words and texts has an inherent potential to promote democratic discourse and human thinking. However, the basis for Lanham's optimistic view of the digital age--a notion that electronic textuality makes "no invidious distinctions between high and low culture, commercial and pure usage, talented or chance creation, visual or auditory stimulus, iconic or alphabetic information" (1993, p. 14)--is beset by some fundamental contradictions which not only imply but reinforce all these oppositions. Reflecting the internal tension of *elitism versus populism* inherent in distinct *ludic* and *resistance* versions of postmodern theory (Poster, 1995), Lanham's digital rhetoric epitomizes an ambivalent oscillation between critical and aesthetic approaches to hypertext on one hand, and a more popular "democratic" appreciation of electronic media, the sub-cultural intertextuality of global culture, and hypermedia on the other. Moreover, as Tuman (1993) has pointed out, new generations of students and youth may yet embody as well as perceive electronic literacy differently from theorists like Lanham and Tuman himself who, in similar fashion to many other well-known hypertext theorists such as Bolter and Landow, have humanistic, literary, and even classical interests well-grounded in the tradition of print literacy.

As Lanham exemplifies, many of the hypermedia theorists and critics retained their privileged literary and critical assumptions, undermining claimed connections to the popular cultural extensions of electronic media. This is perhaps because of the contradictory and arbitrary ways in which a general hypermedia model (a) alternates between focusing on designed interactive narratives and the act of reading or reception as an inherently "accidental" process, and (b) reduces human language and communication generally to the terms of discrete images and information--thus also reinforcing an underlying opposition between print-age paradigms of language-use and the new and ubiquitous popular electronic culture. The incorporation of hypertext theory into a general hypermedia framework of electronic literacy is more than simply a matter of defining hypermedia as hypertext (i.e., "the arrangement of information in a non-linear manner with the computer automating the process of connecting one piece of information to another");

Snyder, 1997, p. 126) extended to include electronic multimedia effects such as digitized sound and graphics. Postmodern literary models of meaning as a contingent product and play of open-ended narratives, language games, and reader-response clearly lent themselves to theorizing about hypertext as, for instance, exemplified by Michael Joyce's "Afternoon, a Story," Stuart Moulthrop's "Victory Garden," and other literary hypertexts associated with [Eastgate Systems](#) and the program [Storyspace](#) (Douglas, 2000; Snyder, 1996). Such privileged models of textuality, reception, and aesthetic process or objects were implicitly at odds with the semiotic move to go from the subtle and intricate textual allusions of open-ended narratives mediated as verbal language-use to include the media of electronic popular culture in terms of language reduced to and even replaced by electronic imagery obsessed with the transitory fixations of human memory and desire.

The residual print assumptions of a convergence between the hypermedia model of electronic literacy and postmodern critical theories or practices is perhaps most effectively analysed in terms of how, as Johnson-Eilola (cited in Snyder, 1997, p. 134) points out, hypertext "encourages both writers and readers ... to confront and work consciously and concretely with deconstruction, intertextuality, the decentering of the author, and the reader's complicity with the construction of the text." In other words, the notion of hypertext usefully reinforces the postmodernist assumptions of such theorists as Barthes, Derrida, and Baudrillard that natural languages and other systems of representation--especially those involving electronic visual media--are autonomous in relation to the diverse and contingent contexts of individual language users, specific language events, and discrete forms of verbal or visual representation. Snyder's (1997, p. 126) admission that "hypertexts are constructed partly by the writers who create the links, and partly by readers who decide which threads to follow" implicitly acknowledges the contradictory use of the term to refer to both the internal links of designed texts (e.g., an open-ended Storyspace narrative) and the meandering "accidental" traces of someone surfing the Net. As Tuman (1993, p. 75) sums up the non-literary perspective: "hypertexts are not really texts at all. They are systems for retrieving information."

In similar fashion to both Landow (1992) and Lanham (1993), Bolter's (1991a, 1991b) use of a Derridean framework to outline his hypermedia paradigm represents a useful focus for unpacking some of the resulting contradictions arising from this implicit framing of electronic literacy in a binary oppositional relation to print literacy. Bolter's understanding of hypertext may be distinguished from, say, that of Landow in terms of being more an open-ended strategy of *writing* than an accidental one of *reading*. Whereas Landow & Delaney (1991) used the term *hypertext* in a plural sense to refer primarily to a reading process, Bolter uses it in the singular sense to refer to a literary model of experimental fictions and post-modernist narratives which involve "forking paths" and recursive games of identity as if in a labyrinth or maze--a model of hypertext epitomized by the program Storyspace, which he helped develop. Bolter refers to hypertext as a kind of "spatial writing" or "topographic writing," and the media of an "electronic writing space." These spatial metaphors for electronic literacy resemble Derrida's account of textual mimesis but refer to an "oscillation of transparency and opaqueness" (with *opaqueness* later reconceptualised by Bolter as *hypermediacy*), which is not quite synonymous with the oscillation of *resemblance* and *difference* described by Derrida.

Derrida's (1980, 1981, 1984) critique of "linear writing" (and associated notions of textual meaning and authorship) was mainly aimed at identifying the rich associative potential of the omissions, margins, and unstable meanings or categories--as distinct from stable genres--represented by texts, and remained basically a theory of linguistic and discursive "supplementation." However, Bolter (1991b, p. 116) interpreted Derrida's reference to "the end of the book" literally in a different way as the signal for electronic media to supplant printed texts in terms of visual aspects of language-use overriding modes of print literacy. As Bolter (1996) recently put it, just as "hypertext calls into question the future of the printed book, digital graphics call into question the future of alphabetic writing" (p. 256). Thus, as Johnson (1997) laments, like other textual imperatives in the electronic age, the dominant paradigm of

Internet design goes "too far" in using images as substitute for language and meaning: "the role of text--letter and words, rather than images and animations--has come to seem like an afterthought" (p. 149).

From the outset, the hypertext model of electronic literacy as a departure from typographic or print literacy was typically represented in terms of an opposition between a linear, sequential, and hierarchical mode of thinking, and open-ended associative thought (Bolter, 1991a, p. 109). The oppositional view of the relation between print and electronic literacy is further typified by Lanham's (1993, p. 16) "metaphorical" use of the split brain hypothesis to discuss how hypertext encourages the associative, holistic, and visual tendencies of right-brained people which have long been dominated and repressed by the linear, hierarchical, and literal-minded aspects of the "left-brain." Likewise, Landow (1992) connected hypertext with a poststructuralist tradition of critical theory to make a distinction between the *hierarchical* nature of modernist culture and the *associative* and *de-centered* principles of postmodernist culture. Similarly, Turkle (1997b) has also interpreted the use of graphic interface and associated visual metaphors on the Internet or in interactive multimedia CD-ROM programs as the critical transition from a modernist computer-mediated culture of "calculation" to a postmodernist one of "simulation." The importance of the graphic computer interface for an "informational" framework of electronic literacy is also usefully summed up by Johnson (1997, p. 149): it helps "us imagine our information, envision it all in one comprehensible vista, in a well-ordered landscape of data scrolling across our screen."

As is the case with Lanham, Bolter's understanding of electronic literacy moves from an almost aesthetic appreciation of literary hypertext to a somewhat abstract embracing of popular electronic visual media (including television) in the public sphere. A related theory of autonomous mediation provides the point of connection between the two main contradictions of the hypermedia model. Thus, Bolter and Grusin's (1999) conception of "remediation" describes a perpetual oscillation between *immediacy* (i.e., actual contexts of the "here and now") and *hypermediacy* (i.e., contexts of communication virtually detached from, or autonomous in relation to, the human experience of the here and now) which also usefully refers to the kind of domain of electronic media imagery depicted by Baudrillard (1983) as a "simulacrum" detached from reality--a mirror of the play of images. Baudrillard's pessimistic portrayal of the electronic media interface as both an entrapment and seduction of society--as well as a reduction of human language-use to terms of mere imagery--compares with the similarly ambivalent views of the Internet in terms, for example, of a great "datasphere" (Rushkoff, 1994) and a "culture of simulation" (Turkle, 1997b). While older generations often feel trapped in this new order, Rushkoff argues that new generations of youth--whom he refers to as "generation Xers"--are feeling quite at home with new electronic media (i.e., have generally come to terms with their ambivalence or love-hate of this medium), and increasingly tend to be interactive users and not just passive consumers. Thus, in ways related to the critical pedagogies of Henri Giroux and Peter McLaren, Rushkoff recognises that young people are able to simultaneously resist yet playfully subvert and creatively reconstruct the new media in terms of how all forms of language-use are open to use and abuse, and are not innately oppressive.

More than Derrida, Baudrillard's postmodernist framework is perhaps the main influence behind Poster's (1995) model of the Internet as part of a digital revolution in mass media that has overtaken the "broadcast" model of radio, film, and television in terms of the interactive possibilities of "two-way, decentralized communication" (p. 18). As a sophisticated theorization of hypertext and hypermedia models of electronic literacy, Poster's model of a "second media age" emphasizes the role of readers, viewers, and consumers as producers or constructors of their own meaning and identity. However, likening the Internet to a great database, it similarly makes no distinction between the production and reception of electronic media as either purposeful design or accidental construction (1995, p. 69). Rather, Poster discusses how the more informal and visual uses of language in the electronic age represent, work on, and play around with the ambivalences of human desire--representing sources of pleasure, but perhaps to be resisted as inevitable ideological distortion and manipulation.

The hypermedia-cum-postmodern ideal of two-way, decentralized communication in the electronic age does not effectively recognize the importance of communication strategies and contexts because it remains informed by the reductionist implications of an underlying informational framework--the reduction of human communication to terms of either mere subjective impression or objective fragments of human reality as data. For instance, conceptions of hypertext as "spatial" writing and hypermedia as a play of digital bits both reflect a reductionist view of the processes and media of electronic literacy in a vacuum as self-fulfilling prophecies of chaos and irrelevance. A popular condition of "infomania" thus is the implicit counterpoint to the privileged "ludic" emphasis of some hypermedia models. As Heim (1992) uses the term, *infomania* refers to the tendency for people to pursue fragmented units or bits of information and to get lost in insignificance: "[I]n the information age, some people even believe that literacy or culture is a matter of having the right facts at our fingertips."

Hypermedia provides a useful focus beginning to talk about designs for interactions between writers and readers as language users. But, reflecting the alternate *ludic* and *resistance* perspectives of postmodern theory, a methodological sleight of hand conceals and confuses the connection between privileged narrative and language games played by writers and the popular reception of electronic imagery and the multimedia interface as a play of desire to be either indulged in, in the pursuit of pleasure or to be critically resisted, as mere seduction or some form of oppression. In other words, hypermedia theorists take a limited view of the literacy implications of electronic media and texts because they recapitulate the failure of postmodern theory to *interpret* (and not merely *describe*) the inherent ambivalence of both privileged and popular forms of representation in the electronic age from a "communication" literacy perspective of designed interactions involving the dialogues of specific strategies and different contexts of relevance. A model of electronic literacy is thus needed which also recognizes how "users" are able to come to terms with their ambivalence towards new electronic media--their ambivalence about the facility of visual, verbal, or hybrid texts to provide pleasure and construct knowledge as well as seduction, propaganda, and, information as an end in itself.

THE NEW HYBRID FORMS OF INTERNET COMMUNICATION: TO WHAT EXTENT STILL "CONNECTED" TO SPOKEN AND WRITTEN MODES OF LITERACY?

In the early development of the Internet, human communications mediated by computers tended to be regarded as a secondary phenomenon in relation to vast databases of networked computers as information technology. Such impressions were perhaps often reinforced by the recreational and popular ludic nature of early text-based synchronous programs--that is, the use of MUDS and Internet Relay Chat for role-playing games, social chat, and the development of virtual communities (Bromberg, 1996; Reid, 1996). As indicated at the outset, this view has begun to change in recent years with the development of more sophisticated versions of computer-mediated communication (CMC) and related functions of Internet conferencing for business and educational purposes as well as for social interaction.

Just as the graphic interface became the impetus for popular dissemination of the World Wide Web, the increased flexibility and sophistication of CMC has contributed to this changing perception of computer mediation and virtual interaction. In recent years, new forms of CMC have integrated both synchronous and asynchronous modes (e.g., [ICQ](#)), the graphic interface (e.g., [Palace](#)), and even aspects of "virtual reality" (e.g., [Worlds](#)). Hybrid programs have been devised which convert text into synchronized animations and voice (e.g., [Masquerade](#)) or allow a range of options for textual chat and audio-visual conferencing (e.g., [NetMeeting](#)). As epitomised by those programs which alternate or blur the distinction between mediated and immediate communication, CMC thus provides a crucial context and focus for appreciating how the hybrid connections between words or text and the multimedia graphic interface represented in hypermedia theory need to be appreciated in the greater cultural and communal contexts of how time and language ever inform and transform the dialogues of human communication, and the

interaction between authors and audiences. In other words, even Web sites are a form of CMC before anything else (information, ecommerce, entertainment, advocacy, etc.) and are being increasingly recognised as such by designers.

CMC includes several additional aspects of Internet hybridity which suggest that a communications framework might appropriate an information perspective on electronic literacy, rather than vice versa. As many commentators have observed, all forms of text-based CMC from asynchronous email through to synchronous Internet chat have tended to represent informal and even playful modes of language-use which incorporate aspects of both speaking and writing, and thus also aspects of *immediate* as well as obviously *mediated* communication across distance in time or space (i.e., aspects of print literacy; Fanderclai, 1995; Rheingold, 1994; Turkle, 1996). Most recreational CMC programs require people to take on a nickname or even an avatar (i.e., a virtual body or graphical icon). Yet this intrinsic formality makes many critics think that CMC must be an inherently superficial and alienating mode of interaction (e.g., Stoll, 1995)--recognizably a permutation of the "pessimistic" view of electronic media and the Internet. As ostensible support for their perspective, they point to the fact that it is easy to fool others by pretending to be someone else or a different gender because the obvious contextual and nonverbal cues of either voice or being face-to-face are lacking especially in text-based chat.

Indeed, as illustrated by the widespread if varied use of the terms *virtual reality* and *cyberspace*, Internet communications do exemplify the rhetorical functions of computer mediation generally to *familiarize* and *de-familiarize* reality, ambivalently and simultaneously. For this reason, postmodern approaches to Internet communication focus mostly on its alternately "resistance" and "ludic" facilities for de-centering or de-stabilizing fixed identities and meanings and promoting experimental diversity, a sense of "multiple selves," and reading as a mode of re-writing. Poster's (1995) discussions about the implications of Internet communication as "public spheres of discourse" thus converge with, say, Rushkoff's (1994) descriptions of CMC used as media "viruses" to resist and challenge hidden agendas in popular culture (p. 239). Likewise, Sherry Turkle's (1997a) view that CMC can simulate, transform, and even augment people's identity has a particular, if ambivalent, resonance for people who feel marginalized or dispossessed. Thus, for instance, in terms of a feminist agenda of self-autonomy, Stone (1999) argues that the virtual interface of computer-mediated communication is an inherently erotic mode because it allows people to imagine transformations of self as "virtual bodies" (see also Argyle & Shields, 1996). However, postmodernist perspectives of ambivalence often end up merely reinforcing a "hall of mirrors" view of electronic media as perpetual processes of either narcissism or entrapment and seduction. Even when such views refer to the celebrated claims of people like Howard Rheingold that CMC can engender new senses of community or society, they tend to selectively focus on effects of identification rather than on processes of communication per se (Bolter & Grusin, 1999; Poster, 1995).

In order to get beyond the contradictions associated with postmodern models of electronic media discussed earlier, a framework of electronic literacy is required that distinguishes between the facility of digital media and virtual interfaces to promote conditions of community and intimacy on one hand, but also to reinforce a sense of alienation and distancing for some people on the other. If CMC is more than just a contradictory mixture of speaking and writing (also, oral and print literacies) then we need to consider how electronic media do involve human imagination, dialogue, and socialization--elements that tend to be ignored or selectively addressed by postmodernist models (Yates, 1996). Although CMC is quickly evolving to allow audio-visual conferencing for business and educational purposes, it is not only recreational users who recognize that *text-based* CMC is better able to productively mediate human imagination, dialogue, and socialization (Collins, 1996; Kollack & Smith, 1999; Wellman & Gulia, 1999). There is significant research as well as anecdotal evidence in the educational contexts of CMC to support this claim (e.g., Berge & Collins, 1995).

Studies done of the educational implications of CMC emphasize its potential to encourage a more active voice in students who may feel intimidated in face-to-face classroom situations--in terms of either racial,

class, or gender difference, or issues of physical appearance and ability (e.g., Pemberton & Zenhausern, 1995). Other studies have emphasized the facility of CMC to encourage collaborative, independent, and generally "constructivist" modes of learning that counter the traditional "transmission" assumptions inherent in views that distance education is simply a matter of putting information or content up on the World Wide Web for access at people's convenience (Columb & Simutis, 1996). The facility of CMC to provide an "authentic" context of interaction or publication has also been well documented--especially in relation to the exemplary possibilities of second language learning (e.g., Warschauer, 1996, 1999). As Berge and Collins (1995) put it so well, the various modes of CMC "are enabling and promoting several paradigmatic shifts in teaching and learning, including the shift from instructor-centered distance education to student-centered distance education, and the merging of informal dialogues, invisible colleges, oral presentations, and scholarly publications into a kind of dialogic virtual university" (p. 2).

While the mediated aspects of CMC tend to defavor prejudice and to empower students, so too the more "immediate" aspects of CMC allow greater focus on a multiplicity of voices. Because of the relative absence of contextual and nonverbal cues, text-based CMC is a mode of interaction that involves reciprocating role-play and informal interaction. If used productively, CMC is able to promote both personal intimacy and a group etiquette or ethics in communication. However, as I have argued elsewhere (Richards, 1998), this very fact also allows people to focus on the organizing or convergent voice behind the sense of multiple selves and virtual bodies, which is a precondition of genuinely reciprocating dialogue.

In contrast to the paradigmatic notion of communication as face-to-face or spoken dialogue, asynchronous CMC is the more fundamental mode in distance education because it allows flexibility in time as well as in space (Bates, 1995). Yet, "realtime" modes of Internet chat exemplify the capacity of text-based CMC to integrate immediate aspects of human communication and interaction as a hybrid of speaking and writing. This might be approached in two distinct ways. Firstly, the obvious mediated aspects of CMC that encourage imaginative play and projections are also a useful reminder that in face-to-face situations, human communication is ever mediated by personal and social or ideological filters of prejudice, fantasy, and various preconceptions generally. Indeed, the postmodern theories of such people as Derrida and Baudrillard provide useful contexts for recognizing and discussing how this process informs or, rather, distorts people's perceptions and language use, but not for recognizing how people are ever potentially active agents of transformation through imagination, dialogue, and socialization. Secondly, the uses of CMC emphasize how immediate aspects of communication and oral literacy are ever implicit in mediated communication, including print texts. The various functions and processes of computer-mediated communication do not provide support for Derrida's arbitrary separations between speaking and writing as systems of communication that challenge traditional models of unitary meaning and linear texts. However, they are consistent with Paul Ricoeur's (1978) dialogical reversal of Derrida's rhetorical model.

Ricoeur's (1976) theory of interpretation approaches every kind of text (this would include electronic as well as oral and print texts) as both immediate and mediated. That is to say, communication is always grounded somehow in the here and now, but also involves what Ricoeur refers to as the function of "distanciation" (which is exemplified by the written text). Like Derrida, Ricoeur makes the mediated aspects of written texts and thus print literacy the starting point for his framework of interpretation. However, Ricoeur's framework differs from and goes beyond Derrida by focusing on the immediate dimensions of printed texts or distantly-mediated language-use in terms of the representations of words and images as rhetorical strategies and effects which are activated and embodied by readers and audiences. Just as metaphor represents a transformation of reality for Ricoeur, the narrative functions of stories involve, for instance, the use of linguistic tenses which invite or even seduce readers to suspend disbelief and view the world in an "as if" mode (e.g., the effect of starting fairytales with "once upon a time..."; Ricoeur, 1980). Ricoeur reminds us that all kinds of human writing and representation involve metaphorical and narrative functions which either reinforce expectations and prejudices, or can actually

serve to change the way people actually see and how they interact with other people and the world in general. In this way, Ricoeur outlines a critical context for interpreting face-to-face communication as a subtle process of mediation. Whereas Derrida dismisses the notion of immediacy in mediated texts as merely the residue of metaphysical "presence," Ricoeur distinguishes a sense of immediacy that connects with the grounded contexts of time reconfigured in the here and now of human action by audiences and readers. Hypertext models of digital texts reflect a postmodern view of culture and literacy dominated by a sense of the "immediate present" (e.g., Hesse, 1996) or what Bolter & Grusin (1999) refers to as "hypermediacy." Yet as Heim (1987, p. 89) argues, the inherent temporality of language in use represents an embodied, pragmatic reference-point for communication, even when using "electric language."

In short, Ricoeur's model approaches all human communication as a *virtual* (in the sense of "imaginative") process linked to and inevitably grounded in *actual* human realities. In relation to the reception of hypertext or the interaction of text-based CMC, it suggests that people should imagine themselves engaged in dialogue with rhetorical personas, masks, and strategies of representation that are mediated through, but not confined or determined by, social and cultural filters of pre-conception and expectation. This is in contrast to the view of disembodied subjects, deconstructed objects of knowledge, and autonomous signs projected by Derrida and other postmodernists. Ricoeur recognizes a potentially transformative (but still causal) relation between an organizing sense of self and the multiple selves, roles, or "designs" that people take on or enact. In other words, human identity and reality are neither objectively fixed or subjectively contingent and should be understood, rather, as ever self-organising and interactive representations, that is, as a *sufficient* rather than a *necessary* or merely *contingent* relation. In similar fashion to the "dialogism" of Russian philosopher M. M. Bakhtin, Ricoeur's framework recognizes processes of interpretation, communication, and knowledge as a dialogue of voices in which meaning is implicitly negotiated, reconstructed, and ultimately imagined both in the here and now and across time and space.

Ricoeur's dialogical framework for interpreting the interaction of immediate and mediated aspects of communication provides a useful context for appropriating Levinson's (1990) somewhat deterministic model of computer-mediated communication as a third age in the historical development of human media. Levinson's model approaches emergent distinctions between speaking and writing--and thus orality (or oral literacy) and print literacy--in terms of an initial communication age defined by the immediate here and now followed by a second age of mediated communication exemplified by print texts. Like Poster's second media age, Levinson's third communication age also focuses on the role of readers or users in the process of mediated electronic communication. However, whereas Poster's model views people as caught up or entrapped in autonomous systems of representation (i.e., disembodied "simulacrum," "dataspheres," or electronic "mediascapes"), Levinson's third age of communication recognizes the new convergences between immediate and mediated human interaction. From a dialogical perspective, immediate aspects of Internet communication remain somehow grounded in or connected to local and immediate elements of interaction in the here and now of participants.

The preceding discussion has attempted to sketch a framework of electronic literacy that includes, but goes beyond, the limitations and contradictions of hypertext and hypermedia models. It has done so in the context of addressing the challenge of developing a relevant typology of digitally networked communication that accounts for various aspects of Internet hybridity and the issue of responding to charges that this is an inherently superficial and alienating mode of interaction. The sliding definitions of hypertext and hypermedia as both "open-ended design" and "enclosed chaos" discussed earlier have been provisionally reconciled and appropriated here in terms of a proposal for an integrated model of literacy. This integrated model views the connection between *oral*, *print*, and *electronic* literacies as progressive stages or aspects of communication, rather than as simplistic binary oppositions (e.g., *associative vs. linear* modes of thinking and writing).

ELECTRONIC IMAGERY AND CHANGING NOTIONS OF LITERACY: THE NEED FOR AN INTEGRATED FRAMEWORK

In his penetrating study *Interface Culture: How new technology transforms the way we create and communicate*, Steven Johnson (1997) argues that the "top-sided paradigm" of words or text being regarded as inferior to images is a temporary aberration. As suggested earlier, a simplistic distinction between print and electronic literacy in terms of a binary opposition of *text versus images* is implicit in both the pessimistic and optimistic projections of a historical move "from book to screen" as touted by hypertext and hypermedia theorists. In their contributions to the recent anthology of essays *The Future of the Book* (Nunberg, 1996), both Landow (1996) and Bolter (1996) support the notion that a visual paradigm of communication--epitomized by the electronic image--is replacing the print paradigm of verbal representation. Following Lanham (1993, p. 76), Bolter & Grusin (1999, p. 264) also invokes the notion of an inverse form of *ecphrasis* (a rhetorical term for attempting to capture the visual in words) to describe recent tendencies in electronic media to replace text with images. Adapting the terminology of Marshall McLuhan (1967), Lanham (1993) refers to the projected transition from book to screen--and a corresponding transition from verbal to visual literacy--as "a major readjustment of the alphabet/image ratio in ordinary communication" (p. 125).

The preceding section of this paper has discussed how a communication framework is required to develop an integrated model of electronic literacy that incorporates oral and print literacies, and that recognizes the imaginative, dialogical, and social dimensions of textual communication as an interaction between poles of *design* and *reception in time*. This understanding provides a context for appropriating hypertext notions that literacy is essentially a process of constructing information visually and spatially. That is, the processes of reading and writing may be "spatially" deconstructed as separate poles of meaning-making. Like Lanham, Bolter credits the Ong-Havelock thesis as a crucial basis for hypertext and hypermedia models of how the electronic image and a multimedia interface will dethrone the word and the properties of print literacy (Bolter, 1991a, p. 239; Lanham, 1993, p. 235). A brief analysis of the further contradictory and selective use of a thesis about the transition from oral to print literacy by the hypertext theorists will provide an additional context for further suggesting an integrated model of electronic literacy within a communications framework. The discussion below will thus provide a basis for describing, yet also interpreting, the changing hybrid relation of word and image on the Internet and in associated interactive electronic media.

As Bolter and Lanham represent it, the Ong-Havelock thesis holds that various developments in the transition from oral to print literacy (i.e., visual transformation of alphabetic literacy into writing and later print texts) are technologies of the mind which represent a progressive "spatialization" of human consciousness that is almost synonymous with, and a precondition of, reason, memory, and individual identity. Hence, the hypertext and hypermedia theorists have typically used oral theory transported into a postmodern framework to portray electronic literacy as the culmination of an essentially spatial notion of textuality and a primarily "visual" model of literacy in human history--and yet, at the same time, a repudiation of the logic of mechanization informing print literacy (Bolter 1991a, p. 64). As Bolter (1991a, p. 241) acknowledges, "Havelock and Ong on one side and the postmodernists on the other have shown us the implications of the technology of writing for literature, for all kinds of cultural communication, and ultimately for our notion of the human mind." The basic contradiction of this manoeuvre can be identified in terms of Lanham's selective appropriation of McLuhan's notion of a modern electronic literacy revolution equivalent to the typographic revolution of the printing press in the fifteenth-century. Indeed, in similar fashion to the "oral theorists," McLuhan held that progressive technologies of alphabetic, chirographic, and typographic literacy did represent a "spatialization" of consciousness--but not in the way a changing "verbal/visual" ratio is framed by postmodern theories of hypertext and hypermedia. References made by McLuhan (1967) to a changing "ratio of human senses" relate to symbolic extensions

of the human body and its sensory systems (p. 5), and not simply to the opposition of *word versus image* suggested by Bolter's appropriation.

Both Bolter and Lanham freely admit to a selective use of Ong's oral theory--appropriating his view of the connection between oral-aural communication and both chirographic and typographic modes of literacy, but also dismissing his emphasis on writing as a basis for individual "interiority" as a humanistic resistance to "the changing icon/alphabet ratio" (Lanham, 1993, p. 78). Notwithstanding the selective appropriations of his work, Ong views orality as not only the precondition of print literacy but also electronic literacy. His notion of a "secondary orality" (historically made possible by writing as a "secondary modeling system") associated with electronic media or the "technologising of the word" thus distinguishes between a cultural orality grounded symbolically, if not literally, in time in relation to acting bodies and local communities, and the textualist reduction of time to space represented by Derridean theory (Ong, 1982, pp. 75-77). Ong's implicit charge here is that Derrida's theory represents the logical culmination of, not a radical departure from, a European tradition of print literacy. As Ong goes on to discuss, the key difference between the "immediate" communication of orality and the "mediated" kinds of literacy represented by print and electronic texts is that face-to-face speakers are more obviously--and by no means exclusively--senders and receivers at the same time, and thus engaged in a perpetual process of dialogue (p. 176). Ong's notion that dialogical communication might also include any significant interaction of self which produces feedback supports Berge & Collins' (1995) move to extend the concept of computer-mediated communication in educational contexts to include any "computer-assisted instruction" involving interactive learning.

The virtual interface of the Internet and other interactive electronic media has been a crucial factor in the hypermedia argument that visual literacy is in the process of supplanting verbal literacy. Turkle (1996) has identified how the visual metaphors of the graphic interface typify a postmodernist culture of simulation. Bolter (1991a, p. 226) distinguishes between the "semiosis" of the graphic interface and the primary use of television as a mere "perceptual" medium. Yet, his use of semiotics as the basis of a *visual* rather than *verbal* rhetoric fails to further distinguish between the cognitive and perceptual uses of metaphor in the graphic interface. Thus, for instance, he remains oblivious to the extent that his own spatial metaphors of electronic literacy selectively inform a view that "both cultural and computer literacy simply mean access to information and the ability to add to the store of information" (Bolter 1991a, p. 237). His adaptation of Lanham's notion that electronic reading should be an oscillation between "looking at" and "looking through" a text into a hypermedia theory of "remediation" recalls Derrida's notion that language is a series of dead verbal metaphors which remain as pale images of the clash between familiarity and difference. To the extent that metaphors indeed represent a convergence between verbal and visual literacy (i.e., in contrast to Derrida, Ricoeur's cognitive theory of metaphor refers to the process, not forms *per se*, of representation), Lanham (1993, p. xii) is right to refer to the electronic screen as "a deeply rhetorical medium".

THE RHETORIC OF DESIGN: ELECTRONIC LITERACY'S "MISSING LINK"?

Despite the inherent contradictions of the framework applied, Lanham's admirable goal to sketch out a digital rhetoric was based on a recognition that electronic textuality represents a much more democratic medium than books and associated print literacies. One explanation for this--a basis for applying a communications rather than informational framework--is that electronic literacy recapitulates elements of oral as well as print literacy, and traditional functions of popular culture, as well as privileged or elitist language use. The most "democratic" aspect of electronic media is the requirement as well as facility for people to "design" their communications--not only when, say, they develop their own Web pages to express themselves or publish information on the Internet, but also when they "rework" linguistic and cultural forms of representation to construct or express meaning for specific purposes in particular contexts of interaction. The need to *select* and *combine* images, words, and increasingly other multimedia

components of textuality in electronic media should make us aware that *design* is, and has always has been, a generic if often implicit function of literacy. As reflected by Kress's (1996) extended notion of design in a literacy context, the design process remakes and transforms past production into new forms and ideas. Insofar as a rhetoric of design addresses some of the key contradictions of hypermedia theory, it provides a crucial missing link in the development of a more integrated and inclusive framework of electronic literacy.

The kind of rhetoric of design articulated by Kress and others associated with the New London Group's (1996) vision of literacy education in the electronic age addresses two of the main contradictions informing the nexus between postmodern theory and a hypermedia framework of electronic literacy. With its obvious debt to Halliday's text-context model of language study, this model does not intrinsically privilege the spoken or written word over nonverbal, graphic, and multi-media modes of textuality. It also stresses the democratic possibilities of learners and anyone using language to communicate by "redesigning" typical purposes and structures for specific contexts of application--in terms of *design* not only being a function of both writing and reading, but *reading* as a kind "rewriting" and thus a process of "redesigning." As Kress (1996) suggests, an applied and futures-orientated concept of *design*, which includes but goes beyond mere critique per se (i.e., "distanced analytic understanding" which tends to be backward-looking), might inform a new theory of literacy which more effectively recognizes the "interaction of verbal and visual modes of representation" and the ambivalent "interested actions" of young individuals of a new generation (pp. 74-79). However, such a theory needs to be refined further to reconcile critique and design in practice and overcome the postmodern contradiction typified by binary oppositions between ludic and resistance models, and between privileged or elitist and popular forms of linguistic and cultural representation.

Just as Halliday's communication theory of language has often been reduced to a mere grammar or notions of critical reception as ends in themselves, the concept of design as both process and product, and both potential and structure, needs to be recognized as a dialogical relation in order to avoid the kind of sliding definitions, reductionism, and methodological sleight of hand evidenced in postmodern theory. Versions of genre theory associated with Halliday's text-context model of language study often reflect the same sliding definition of genre as outlined by Derrida (1980): the confusion of *genre* as both a type of text and a unique act of language-use. As Kern (2000) suggests in his adaptation and development of the New London Group model, the concept of genre might productively be understood in terms of the linguistic pool of "available designs" by which learners "interpret, express, and negotiate meaning within a variety of contexts" (p. 54).

The concept of design was conventionally defined in the past in terms of the planning and construction of material products. The widespread use of computer simulation and various modes of virtual reality demonstrates the need to extend the concept to include linguistic and cultural materials. A rhetoric of design is suggested by how the verb *to design* refers to the convergent process by which people construct things and situations as essentially a process of visualization or imagination mediated by language and transformed into either virtual or actual reality. Although the New London Group model of design ostensibly recognizes the transformative agency of text and language users, its exclusive focus on socio-cultural contexts for language as an open system of change tends to ignore individual performance and personal creativity as factors of linguistic and cultural transformation. As well as implicitly projecting language as an inherent and relativist flux (merely "translated" by individual agents), this model might be developed further to recognize the dialogical relation between *design* as a transformative act and a pool of conventional resources and forms open to "redesigning." In other words, the act or performance of designing either language or material products is inevitably set in, but not determined by, a cultural context and social repertoire of typical design models, habits, and practices. As Ricoeur (1979) has further articulated in terms of a non-romantic theory of imagination, human activity is always a process transformed and embodied (either virtually or actually) by individuals who express their desires, values,

and self-knowledge in terms of the interaction between "personal" and "social" horizons of expectation, experience, and taste. The acts of *selecting* and *combining* visual as well as verbal elements of textuality or production thus represents a "surplus of meaning" which reflects the distinction between design as a mere process of *translation* and an embodied one of *transformation* and interactive communication.

In this view, the postmodern opposition between thinking as logical classification or linear sequence and a subjective play of associations is seen as a part of a dialogical process of complementary stages, and an oscillation between the personal and social horizons of language use. *Design* may be recognized as alternately a spatial and temporal metaphor of how language mediates human learning, thinking, and knowledge. In similar fashion to traditional oral cultures, the originality of creative imagination once again becomes understood as more than either romantic genius and unique designs or accidental pastiche and superficial "bricolage," but the ability to rework a plethora of cultural materials and "available designs" (i.e., an intertextual diversity of language-use) in relation to a particular context of application or actual performance. As Kaufer and Butler (1996) suggest, a rhetoric of design grounded in new requirements of electronic literacy will recover some of the traditional "oral" and "cultural" functions of rhetoric as a generic discipline of knowledge.

A rhetoric of design provides a useful context for arguing that an integrated model of electronic literacy should include a notion of "critical literacy" which represents a practical strategy for dealing with the inherent ambivalence of electronic media generally (Burbules, 1997; Lunenfeld, 1999). As Rushkoff (1994, pp. 3-16) suggests, reflecting a general recognition that electronic literacy inevitably involves new cultural literacies, educators should harness the practical understanding and applied knowledge of new generations of youth growing up to be familiar with digital interfaces, as well as the cultural content of electronic intertextuality. Younger generations may be better able to deal with ambivalent clashes of familiarity and newness or difference than their parents. However, Rushkoff's exhortation to people to resist the hegemonies of electronic media as public discourse by engaging in media viruses or provocative media events does not really distinguish between individual or collective acts of mere narcissism which reinforce the status quo and effective transformative engagement. In other words, it does not distinguish between informational anarchy and strategies of dialogue. Again, a communications framework will be needed to make such distinctions. A rhetoric of design thus addresses the crucial pedagogical challenge of education in the electronic age. In other words, it provides a context for encouraging students and language-users generally to practice an appropriate balance between skepticism and suspicion towards the media of digital communications on one hand, and confidence to extend the social repertoire of available designs and typical practices by experimenting with and applying new skills, modes, and designs of electronic literacy on the other (Brent, 1997; Bigum & Green, 1993; Peters & Lankshear, 1996).

As Ricoeur (1976) has outlined, a dialogical framework of knowledge represents the interplay and connection (i.e., "hermeneutic arch") between initial *naïve* understandings or popular practices and subsequent *critical* explanation or reflective stances towards the world of actuality. The transformational methodology of *naïve*, *critical*, and *dialogical* modes of knowledge corresponds to the progressive interplay of acting bodies, social conventions, and cultural worlds at the intersection between actuality and imagined virtuality (also, the intersection between the mind in time and the body in space; Richards, 1996). Thus, critique and a rhetoric of design grounded in diverse rather than merely privileged or abstracted contexts of language-use are provisionally reconciled as complementary functions and progressive stages of the literacy process--just like any other virtual or material design process. Such a perspective provides the basis for a more integrated framework for electronic literacy which overcomes the inherent contradictions and self-fulfilling prophecies of postmodernist perspectives in terms of recognizing how culture and language in the general sense not only mediate but ever transform human actions, interactions, and communication generally (Fornas, 1999; Scollon, 1998). The restraints of this paper preclude a more detailed articulation here of a dialogical rhetoric of design than that sketched above (but is presently being refined in a work-in-progress titled "Electronic Literacy: An integrated approach").

However, the discussion has attempted to practice its own theoretical perspective. It has applied a dialogical approach to the challenge of redefining literacy in the electronic age in terms of an engagement with the hypermedia framework--an appropriation that respects and distinguishes the productive contributions of the hypermedia (and postmodern) theorists discussed, and recognizes that "knowledge" (and even "truth") are functions of, and stages in, an implicit oscillation between different and even ostensibly opposing perspectives.

CONCLUSION

This article has engaged some influential hypermedia models as a context for considering an integrated framework of electronic literacy which accounts for Internet hybridity and the inherent ambivalence of interactive electronic media from a "communication" rather than "information" perspective. The related challenge of developing a relevant typology of Internet communication has provided a further and more integrated perspective on how new modes and media of electronic literacy--especially those involving the use of a graphic interface and virtual interaction--relate to both oral and print paradigms of mediated discourse and human interaction. The main argument developed here is that it is not only possible, but necessary and important, to frame the rhetorical use and abuse of inherently ambivalent electronic media in terms of (a) a distinction between accidental or contingent and strategic or designed meanings, and (b) a recognition that literacy is ever a *dialogical* process whatever the mode and medium of communication between authors and audiences. As discussed above, the inherent contradictions and limitations of the kind of postmodernist frameworks employed by many hypertext and hypermedia theorists have resulted in selective, limited notions of electronic literacy--the antidote for which, it has been suggested here, is a communications framework for a dialogical "rhetoric of design."

ABOUT THE AUTHOR

Cameron Richards teaches instructional technology in teacher education at the Singapore National Institute of Education. Prior to this he worked for 6 years in the School of Language and Literacy Education at Queensland University of Technology, Australia, where he developed his practical as well as theoretical interest in the problem of relevant frameworks for new electronic literacies.

E-mail: crichards@nie.edu.sg

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Lateral Literacy: Hypermedia and thinking Lateral literacy and the world of hypermedia represent a lateral environment which is described as a non-linear way to assess and use information—unlike the linear skills needed to read and analyze a book. Thinking laterally allows users to perform multi-level tasks and to synthesize disparate pieces of information for greater understanding or knowledge. Definitions include computer literacy, library literacy, network literacy, internet literacy, and hyper literacy. 5 The roots of hypermedia and the Internet in military culture are significant in contemplating their socio-cultural implications. Bush wrote “As We May Think” while Chairman of the National Defense Research Committee under Roosevelt. Engelbart’s report on the augmentation of intellect (Engelbart, 1962) was prepared for the U.S. Air Force Office of Scientific Research during the post-Sputnik period of educational reform legislated by the U.S. National Defense Education Act (1958). To get at the question of which literacy processes are facilitated or challenged in hypermedia, Salmerón et al (2005) suggest that it is worth framing the literature on. 8.