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## **Literacies and libraries – Archives and cybaries**

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### **Introduction**

Although literacy-related educational policy and practice in the “West” has been dominated by the disciplinary knowledges and practices of educational psychology, in the last decade there has been a notable move towards social approaches to literacy. Such approaches in part have been based on American research and development in ethnography of communication and Vygotskian psychology, but as well through the development of critical sociological models in the UK, Australia and other countries that draw broadly and eclectically from Frankfurt School sociology, French poststructuralism, feminist and postcolonial theory (Fairclough, 1992; Muspratt, Luke and Freebody, 1997).

Given the specific and complex nation-state and regional spatial locations, social histories and community ecologies of literacy (Barton, Hamilton and Ivanic, 1994), it would be erroneous to attribute such paradigm shifts principally to academic discovery, or disciplinary and sub-disciplinary change. It is only the most politically naïve reading of the practices of policy and knowledge formation in schools that would suggest that change in literacy education has its basis in the emergence of new “truths” about literacy or in correct and “efficient” approaches to literacy pedagogy. This is, of course, the self-congratulatory “great man” or “great theory” account of change that, not surprisingly, complements well the corporate commodification of “method” and the seemingly endless government searches for final solutions to the literacy problem. Yet change in literacy education is no matter of personal genius or scientific truth. It is an historical process, located within shifts in local political economies of language, textual practice, and text-based social relations. From this perspective, it is our central claim that the advent of new technologies, new globalised cultures, and the shift towards transnational economies, based on information, semiotics and, indeed, textual and linguistic markets have, at the least, set out new conditions for the reconstruction of the institutions and practices of literacy education.

Whatever openings for social approaches to literacy that have arisen are due, in large part, to postwar and what we might term the “post-postwar” sociocultural, economic and technological changes of “New Times” (Hall, 1996). Given the continued salience and ossification of what we might call the print-based, industrial model of schooling, the present is an historical moment of considerable strategic significance in terms of the remaking of educational policy and curriculum. Despite the efforts of ‘basics movements’ to reinvoke postwar models of print literacy, any educational project of postmodernity must address quite explicitly the design and construction of individuals’ life trajectories and the social futures of communities, regions and, indeed, the remnants of nation states (New London Group, 1996; Kress, 1995). And it now seems clear that, as the current convection of social and economic conditions, including structural underemployment and unemployment, shifts towards service-based economies, the development of alternative, non-traditional pathways to universities and

colleges, has, at the least, led to new patterns of life choices, agency and ‘at riskness’ that researchers are only now beginning to document.

Without slipping into the ubiquitous technological determinist arguments that the millennium seems to invite, we would remind readers that only thrice before have developments in communications technologies of similar magnitude occurred. The first was the breakthrough to alphabetic literacy some 3,500 years ago; the second was the invention of the printing press in the fifteenth century; and the third, of which current developments could be seen as an extension, involved the inter and postwar development of what McLuhan (1962) called “electronic” technologies of radio and television.

Particular technologies enable reconfigurations of the communicative practices of everyday life, of the social relations of such practices, and, eventually, of the invention of various institutional apparatus for the regulation, control, production and mediation of such practices. As Goody (1987) argues in his anthropological account of the transition from oral to literate cultures, such transitions are not marked by simple epochal change. Binary explanations of change fail to capture the complexities of the material and social processes by which new hybrid forms of textual and social relations, institutional practices, and systems of commerce and government emerge. Consider, for example, the remediation of the epic oral poem of Homeric culture into the written, governmentally-commissioned epic poem of Virgil; the transition from the classic “fifth estate” genres of the *New York Times* to the TV emulating text forms of *USA Today*; the emergence of forms of rap music and street poetry that are at once extensions of longstanding African-American oral and musical genres, blended with new digitised “sampling” from the historical archive of rock n’ roll. In each case, these texts, their affiliated social relations and institutional communities, producers and audiences blend complex textual traditions and practices of technologies old and new.

All human messages—including spoken and written text, sound, graphics, photos, video and animation—now can be (re)presented, stored and reproduced in strings of ones and zeros, called binary digits (i.e., bits), and processed, sent and received at lightening speed by machines. This transformation is commonly referred to as the shift from “atoms” to “bits” (Negroponte, 1995). Within the technologisation of language and literacy in cyberspace and hypermedia, notions of “literacy” and of being “literate” are being reinvented. Critical literacy, visual literacy, electronic literacy, digital literacy, internet literacy, media literacy, technological literacy and multiliteracies (Craver, 1997; Gilster, 1997; Kubey, 1997; Kress and Van Leeuwen, 1995; A. Luke, 1997; C. Luke, 1997a, 1997b; Martin, 1997; New London Group, 1996) are but some of the hybridised forms of textual practices that have been devised in response to, *inter alia*, digitised technologies. To begin assessing the implications for education and literacy, consider this simple historical vignette.

For millions of us in American schools of the 1950s, one of the canonical textual genres was the preparation of the social studies “report” in upper primary school and secondary school. For a report on, say, Korea, our actual strategies for textual construction typically involved: consulting the library card catalogue, locating the 3 or 4 monographs in the library that might have sections on Korea, and identifying the *World Book* or *Encyclopaedia Britannica* passages on Korea. Whilst our teachers cautioned many of us about the veracity of what we saw on TV, critique of the dictionary and encyclopaedia was far more rare. Prior to the Xerox machine, our actual textual practice involved a curious admixture of paraphrasing and rewording passages from books of canonical knowledge. Encyclopaedias, dictionaries and monographs were indeed situated “beyond criticism” (de Castell, Luke and Luke, 1989).

If one were mischievous or ambitious, a scissored picture or map from *National Geographic* might have provided the icing on the report. From either a cognitive, information-processing perspective or an ethnographic perspective, we could characterise the repertoire of textual practices, cognitive operations and engagements with the culture of the

library that we might have learned: navigation of the Dewey Decimal System; paraphrase and lexical substitution – textual skills never mentioned in syllabus documents; copy-matching and note-taking from written sources. Clearly, these are pre-Xerox writing practices that are less prevalent today. But note that the critique of sources did not figure prominently in most of our reports, which consisted of chunked textual representations of facts derived from other sources. Note also the limited volume of the archive that we had to deal with. The school library's holdings (of perhaps 500-3000 books, depending on where one grew up) might have yielded 6 to 8 monographs and textbooks of various vintages, designed for specific age/grade ranges. Redundancy and diversity were hardly the problem in a print-based, canonical orientation to school-based literacy training and where it did occur, librarians and teachers provided us with clear operational criteria for selection. For example, many of us learned to rely implicitly upon the 'latest' sources; and, without any formal training in readability formulae or the semiotic layout of children's books, all of us learned to differentiate books by the target age of their readership.

In a lineage reaching from Alexandria to the small school library in any postwar *Pleasantville* primary school to the new university cybrary, the archive of human knowledge—its physical medium and spatial location, its size and sources—have changed immeasurably. Today an upper primary student interested in Korea might log online and use a commercial search engine to chart 1000 citations on various aspects of Korea. Narrowing down her/his search, she might manage to cull several hundred. Engaged in associative cognitive processes and reading practices that have yet to be fully documented or explained by research, that same student will construct critical criteria, navigation and search strategies, sifting, filtering, recursively clicking backwards and forwards, critically and acritically deciphering visual cues. Other than rather crude bars to particular websites deemed by adult authorities as of dubious moral content, these new textual practices with the archive are beyond immediate teacher or librarian control and surveillance – particularly in those contexts where a generation of teachers' navigational skills lag behind those of the students. Unlike the procedures with traditional school libraries, this process is characterised by diversity and redundancy of information. Hence, the challenges for critical reading practices—much less the recomposition, writing, referencing and delivery of the report via, for example, a website or multimodal pastiche cut to CD ROM—have changed fundamentally.

Here we want to take up another naming and reframing of literacies old and new, one that is not widely known outside the context of libraries and information services, viz., "information literacy." Our claim here is that traditional print literacies – which schools have developed elaborate curricular and pedagogic technologies to produce – are not sufficient for students immersed in the mediascapes and infospheres of classrooms and libraries, homes, cafes and new civic spaces. We begin, then, from what now is a cliché: that the shift from print to digital culture requires a revisioning of the entire concept of schooling. But our particular spin on this theme is how the technological and information revolutions have transformed not only classrooms, but also the spatial design and function of academic and school libraries. Our argument here is that, far from rendering the library obsolete, the position and significance of the library, and of emergent concepts and critical literacy, are central to digital forms of teaching and learning. At the same time, we want to show how the current attempts by librarians to define "information literacy" have fallen short of an engagement with the critical demands and potential of new technologies and media.

## Literacy and the Library in New Times

Francis Bacon called libraries "... shrines where all the relics of the ancient saints, full of true virtue and that without delusion or imposture, are preserved and reposed" (cited in Bacon, 1955, p. 223). For his part, Bolter (1991, p. 101) elegantly refers to libraries as "a kind of monumental writing, a writing and reading space in stone." With a powerful iconicity of tradition - "Justice, Truth and Liberty" carved above imposing pseudo-Oxbridge sandstone entrances or emblazoned across interwar WPA murals - libraries purportedly represent all that is materially and symbolically venerable, valuable and meaningful to institutions of learning.

How do standstone and socialist realism, leather binding and paper, Dewey Decimal and the card catalogue stand up to the postmodern? Just as McLuhan's proclamation of the "death of the book" was premature, the heralded postmodern demise of grand theory remains, we observe without irony, institutionally counterfactual. Most academic departments, most school staff rooms, and indeed most school libraries are not sites for the expression of an "incredulity toward metanarratives" (Lyotard, 1984). Quite the contrary: modernist disciplinary assumptions continue operationally unchanged as curriculum foundations in schools and universities. In many everyday curriculum debates, even hints of "inter", "cross" and "trans" disciplinarity tread dangerously on longstanding intellectual and industrial divisions of labour between teachers, departments, schools and entire institutions. The very order of training for *homo academicus* in schools and higher education thus remains founded on Cartesian and Newtonian rationalism and objectivism. This extends beyond the confines of scientific training to include trainings in the social sciences and the arts that continue to privilege structure, function, systematicity and empirical method to the exclusion of alternative and emergent ways of knowing, seeing and saying.<sup>1</sup>

Our point here is that despite the moral panic of 'back to basics' movements in populist educational politics and political backlashes against minority and women's movements in universities, educational fields of disciplinary knowledge and power have shown a remarkable stability and tenacity in the face of radical social, cultural and economic change. The codex book is a key instrument in this process of codification, stabilisation and, indeed, potential ossification of knowledge. As a technology, its revolutionary characteristic was that it could be used to encode messages in a semi-permanent, portable and, with the advent of the printing press, economically and industrially reproducible artefact (Goody, 1987). Within the pedagogic regimes of modernism, the book moved from its status as a medium of divine, spiritual "truth" to a detached and immutable artefact that embodied irrefutable "fact" (Kapitzke, 1995). From the advent of mass literacy, secular schooling and the foundation of the biological and human sciences, the book was transformed from a technology of spirituality to a technology for the empirical objectification of the world (Halliday and Martin, 1993). Pedagogy with and through the authority of text thus has emphasised the discovery and acquisition of scientific, historical and even moral "facts," a focus that often has militated against various curriculum reform movements of the last twenty years that have attempted to reinstill student agency in knowledge construction.<sup>2</sup>

Since the Enlightenment, the social and spatial organisation of textual knowledge in libraries has historically been a key aspect of the institutionalisation of scientific knowledge and method (Hubbard, 1995). Models and taxonomies of scientism infiltrated library "science" to the extent that disciplinary collections were conceived as reifications of objective, natural and social realities, and of the research practices for objectifying and defining those realities (Frick, 1975). The classification and physical arrangement of collections into orders of hierarchised materials - the encyclopaedia being the apogee of factual knowledge - privileged and reinforced disciplinary boundaries.<sup>3</sup> The very historical structure and organisation of the library thus expresses a will towards permanence and

canonicity. Librarians throughout the last century have often been trained to see their role as “custodians”, archivists, even curators, which are metaphors drawn from Arnoldian and Levisite models of high culture. As any acquisitions librarian would know, it is the responsibility of the modern librarian to select and catalogue the “best that has been thought and written”, the “true” – not just the popular, and certainly never before the redundant, the arbitrary, the diasporic.

The digitisation of textual knowledge has put all this up for grabs. As well, major shifts have occurred in epistemological assumptions across the social sciences, humanities, and, not incidentally, in many traditional ‘hard’ sciences. Though affiliated with postmodernism, these are also artefacts of: the “linguistic turn” in the social sciences that began in the early 1960s; work in neomarxian sociology of knowledge in the late 1960s; the emergence of women’s, postcolonial and minority knowledge claims, across three decades; new social movements and alliances, and other demographic and cultural configurations affiliated with New Times. Among the more provocative claims of these new epistemologies:

- ◆ knowledge is already and always mediated by cultural and subcultural systems of signs and symbols;
- ◆ knowledges and truths are localised and partial, contested and dynamic social constructions;
- ◆ corpi of knowledge and their affiliated social fields and disciplinary communities are, like cultures and subcultures, heterogeneous and heteroglossic, multiple and diverse; and
- ◆ the formation, production, regulation and critique of knowledge necessarily entails relations of power and capital.

Our point here is that these epistemological perspectives actually reshape authorship and readership, text and knowledge in quite divergent ways from those that currently underlie the institution of the library – no less the practices of print literacies. Such a shift has the potential to destabilise notions of the library *qua* collections of canonised and codified epistemological and cultural artefacts (Barber, 1995). It also queries the authority of the teacher/librarian as arbiter of what might count as legitimate knowledge.

Since prototypes for cybernetic systems theory in the early work of Shannon and Weaver (Wilden, 1980), “information” has become a privileged term in the postwar period (Poster, 1990, p. 7). Their notions of communication, information and “feedback”, founded as they were on radio transmission metaphors, proved of significant value to both military operations and the development of missile and satellite systems (Wilden, 1987). Indeed many of the early postwar breakthroughs in the “information revolution” were produced through a Cold War military/industrial complex, including, of course, the original conceptualisation and design of the Internet, the miniaturisation of transistors and later, microchips for aerospace guidance systems. Much of the technological, systemic and conceptual architecture for globalised economies and fast capitalist culture was based on the commercialisation of early military and governmental hardware, and on the software and infrastructure of transnational corporations. Of course, this paradigm of “information” has spawned disciplinary fields and with them, flagship publishers, journals, research centres and “research parks”. It was during the 1960s that cognitive science defined as its object “information processing,” which in turn became a central metaphor for the reorganisation of work, institutional systems and, ultimately, economic exchange. It enables the reframing of literacy and education, cognition and consciousness, in ways that epitomise the goals of secular, capitalist nation-states: “information processing” renders texts and textuality neutral and technical, secular and scientific, ostensibly divorced from moral or political normativity.

In the postwar political economy, work, leisure and culture have been reconstituted as “information processing”. Subsequent technical developments have brought together satellite technology, digitisation and computerisation into converging economic and technical fields (Stevenson, 1994). Technophiles and technophobes concede that information technologies have radically transformed everyday life. Defenders of the Internet from governmental control and censorship declare that “wiring up” will give human beings “the power to begin the world over again” (*Wired*, 1995). Cyberphiles present visions of utopia (Benedikt, 1991; Dertouzos, 1997), while neoluddites describe dystopias of alienated social relations, intellectual and cultural poverty, and deteriorating ecological and material relations (Hirschl and Stack, 1997; Postman, 1993; Roszak, 1986).

Australian literacy educator Bill Green (1997) is one of several critical commentators who has documented significant shifts in education and classrooms. The following figure (see Figure 1), based *inter alia* on Green’s work, is a hermeneutic framework for potential changes in schooling.

<u>FROM</u>	<u>TO</u>
book	screen
school	media
standalone	networked world
social logic of place	social logic of flow
teacher directed	student centred
classroom based	resource based
teaching	learning to learn
instruction	construction
subject centred	interdisciplinary
knowledge as information	knowledge as design
passivity	interactivity

Figure 1: The Shift from Industrial to Information-based Schooling (based on Green, 1997)

As we noted in our introduction, binary description of epochal change is potentially misleading; the narrative historical obsession with periodisation leads to what are ultimately arbitrary and random ‘cut off’ points of prewar/interwar/postwar, BCE/ACE, etc. Green’s approach is useful nonetheless in highlighting evolutionary possibilities and discursive discontinuities. One such shift has been the move in language and literacy teaching from the teacher to the social logic of “exteriorised” information through the “partial replacement of teachers by machines” (Lyotard, 1984, p. 51). The loci of learning and teaching have moved from the book to the screen, from instruction to construction, and, potentially, may move from the classroom to the virtual and phenomenological space of the library/cybrary/IT lab (Smith, 1993). In the production of knowledge, the interface of the school with emergent forms of social organisation, the teacher with the curriculum, the learner with learning materials, and reading with the act of research could now be relocated in the library. Yet even as such, technology potentially recentres the library in educational institutions, these same changes are slowly unravelling the foundations of the library as an institution, physical structure, and, indeed, for all of us print creatures who found the library an ‘eye in the storm’

of school culture, as a comfortable way of being and non-violent form of life. The ontology and teleology of the library are coming to bits.

The technologisation of information organisation and management has destabilised the centrality of library work. Consider this metaphor: libraries have historically constituted a dynamic cultural centre, a social nexus, a physical meeting place, and indeed, an ethical and intellectual ‘heart’ to educational institutions. To test the metaphor against the library’s own canon, let’s check a school dictionary. *The World Book Dictionary* (1995) offers us three relevant definitions for the term “heart”. They are: an organ that is central to the functioning and well-being of the body; a middle or centre; and the main part or essence of something. Libraries may constitute a means of the information flow that keep the bodies of educational institutions functioning. Technically, once wired, they are the loci of the dominant “modes of information” (Poster, 1990) that have replaced industrial means of production as the focus of intellectual and semiotic economies. Libraries are often architecturally at the centre of university campuses and school grounds. In the classical interwar American High School, the library typically was located adjacent to the administrative zone. In some 1980s and 1990s Canadian school design’s, libraries were located centrally, separated from corridors only by glass partitions – constituting both a transparent ‘centre’ and a panoptic position for monitoring student movement in corridors. In the last two decades in particular, the functional provision of libraries, their actual holdings, and technological and service capacities have become ‘essential’ markers of when schools reach threshold sizes for funding, student support, and the provision of particular subjects for study.

Yet this notion that libraries might constitute a textual ‘heart’ or a ‘core’ corpus of texts and knowledge, wisdom and fact also is problematic. In more free-flowing, localised economies of knowledge and power within semiotic based economies, knowledge spreads and diffuses in capillary and rhizomatic patterns, often without a central official source, core or origin. These metaphors certainly better account for the operation of the internet, the ‘hollowing out’ of the bureaucratic state and central office of the corporation, and, likewise, might offer a better metaphor for the potentially diffuse character of the library in new times:

- ◆ a library that is geographically everywhere and nowhere (in no single place);
- ◆ a library of flows of information across disciplinary and territorial boundaries, rather than a library of delimited and pre-catalogued disciplinary spaces;
- ◆ a library that is diffused across a campus and campuses with diverse architectural locations, physical sites, and alternative environments of social relations for access by student bodies;
- ◆ a library that offers access to both a centrally-housed (or perhaps ‘just in time’ printed and delivered) print archive, and as well to virtual space and connectivity that exists only in highly compressed space and time;
- ◆ a library that may have an infinite number of user/librarians who can classify and catalogue, include and omit in agentive ways previously unavailable to ‘cardholders’ and ‘users’;
- ◆ a library where librarians become more critical commentators, mediators and mentors – and perhaps nomadic intellectuals and cultural tourists - rather than traditional archivists and monitors.

The discourses of “library science” – the term itself a statement of the disciplinary capture of libraries – have begun to change. In the last decade, the “librarian” was reinvented as an information manager, media specialist, resource consultant, knowledge navigator, virtual librarian and cybrarian. Within the context of “smart” classrooms and the flexible delivery of courses, their roles changed from that of materials custodians to information brokers and

facilitators. Current duties include those of database interface designer and consultant, electronic and virtual materials publisher, reviewer and monitor of the quality and integrity of online resources, metadata specialist, software consultant, and intellectual property and copyright advisor. The physical sites for their work have been rechristened resource centres, information services centres, hybrid libraries, virtual libraries and cybraries. Some of the more sophisticated and cyber savvy institutions refer to themselves as “electronic portals” or “gateways” for information “clients”.

The emphasis has shifted, then, from the library as a bounded place confined within walls to its being a (web)site that acts as an entry point to the boundless space of an information highway. Online information is available via a computer, a modem and a phone line from “any place, any space, any pace, any time.” As nodes of information and communication, they are now places *and* (virtual) spaces, systems of networks and flows.

In such an environment, knowledge counts, but with consequential and inconsequential, systematic and arbitrary effects, organised and chaotic flows. Here students are recast and, quite literally, relocated as information producers and consumers in a fast capitalist linguistic and semiotic marketplace. What the learner, the novice, the information apprentice faces is a complex and unprecedented constellation of texts, information and signs characterised not by lack, not by limitation, but rather by surfeit, by redundancy, by infoglut. Attempting to reposition the library and the librarian in this milieu, one library expert commented, “The new literacy is information literacy, and the people best positioned in our schools to develop the skills our students will need for the new millennium are the information specialists—teacher librarians” (Jagger, 1998). But in the midst of this kind of major institutional and professional change: How is the pedagogic and textual work of the library to be reframed? What follows is a critical analysis of the librarian’s new *modus operandi*: the framework of “information literacy.”

### **Information Literacy: Paradigm Regained or Lost?**

Since the 1960s, the activity of information education via library skills instruction programs has evolved through several paradigmatic frameworks (Arp, 1994). These programs have included Study Skills, Bibliographic Instruction and Information Skills. The most recent shift to “information literacy” occurred during the 1980s and, as with any paradigm shift within a professional/educational field, was the object of fierce resistance and debate (cf., Arp, 1990; Foster, 1993). In the new common parlance of librarians and library educators, information literacy is about being knowledgeable about information. In key policy and textbook statements, its consequences spiral out into a series of foundational goals that could characterise any number of literacy-related policy initiatives: these include, notably, “independent and lifelong learning” (California Media and Library Educators Association, 1997; Farmer and Mech, 1992). With the move in many state curricula towards problem solving through resource-based learning, these goals appear relevant. But, given the more general claims we have made here about the social, cognitive and intellectual consequences of information-based economies, fast capitalism and the new technologies, we would ask: What are the epistemological elements of such approaches to information literacy?

Despite residues of a first wave technologism in some of the literature (Eisenberg and Johnson, 1996; Mendrinis, 1994), its advocates among the community of librarians and library researchers assert that information literacy is “more than computer literacy” (Valenza, 1996). Clearly, many librarians are making a concerted effort to distinguish learning technology, from learning with technology, from learning through technology – a key distinction forwarded in a landmark Australian government sponsored study, *Digital Rhetorics*, undertaken by Chris Bigum, Cal Durrant, Bill Green, Eileen Honan, Colin Lankshear, Wendy Morgan, Joy Murray, Ilana Snyder and Martyn Wild (Department of

Education, Employment, Training and Youth Affairs, 1997)<sup>4</sup>. For that research team, the distinction was a strategic move towards redefining and reappropriating the relationships between information technology, literacy and the cultural politics of education, from current positions in technocratic ‘button pushing’ approaches, still dominant in many teacher education programs, and from cognitive scientific definitions of person/machine interactions that, to date, have dominated research and development in information technology education.

Given its legacies in cognitive science, and its practical ‘ownership’ by a principally male group of converted maths and science educators in many schools and teacher training programs, it shouldn’t be particularly surprising that approaches to information literacy taken in curriculum studies tend to reproduce the presuppositions of print-literacy *qua* individual psychological skill (cf. A. Luke, 1997). Similarly among librarians: the standard text quoted and used by many school librarians in the US and Australia is Eisenberg and Berkowitz’s (1996), *Information Problem-Solving: The Big Six Skills® Approach to Library and Information Skills Instruction*. As defined by the authors, information literacy comprises a trademarked six steps in a “hierarchy of skills.” The skills are to: define the task or problem; select the resources that will solve the problem; locate the sources; engage with and use the materials; synthesise the information; and evaluate the product and the problem-solving process. Figure 2 presents a more detailed outline of the framework.

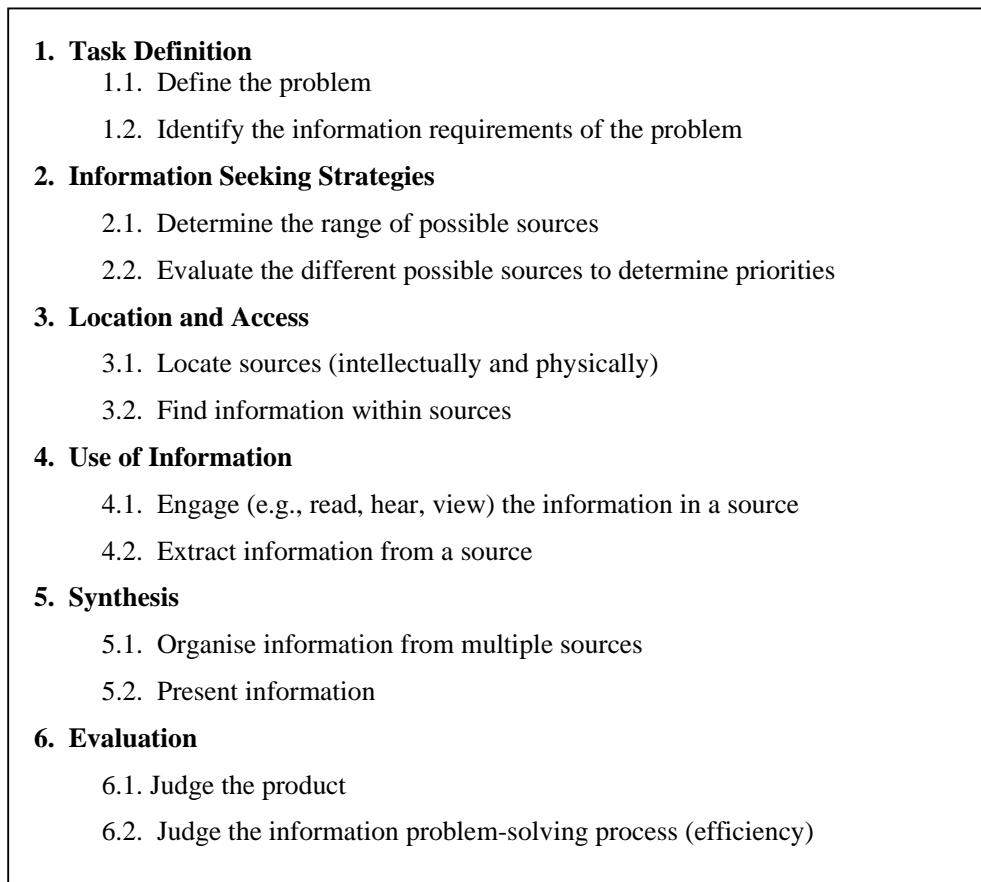


Figure 2: Eisenberg and Berkowitz’ (1996, p. 24) “Big Six Skills Approach” to Information Literacy

What is interesting about this hierarchy is that its approach to information literacy is oriented around industrial metaphors of an “efficient” generation of a “product”. Linear skills

hierarchies tend to be very useful in generating teachable instructional sequences for students. However, common uses of the Internet tend to be non-linear, recursive, and, taking a leaf out of McLuhan's book, "simultaneous". In this way, problems and tasks encountered by Internet users tend to be defined and redefined in dynamic, reflexive practices that, quite literally, second guess and critique each decision as it is being made. In this way, Internet use tends to model the kinds of destabilisation of traditional "figure-ground" relationships between knowledge, its objects, and its graphic/semiotic representation that, we argued earlier in this piece, were at the heart of enlightenment knowledge. Internet use is an "underdetermined" semiotic process (Poster, 1999), where the fixity of sources, the apriori definition of problems – the very canonical moves of scientific method that are represented in linear taxonomies like Eisenberg and Berkowitz's – may be neither the most "productive" nor most "efficient" strategies.

The notion of "underdetermination" was recently developed by American cultural theorist, Mark Poster (1999). Drawing from the Althusserian concept of ideological "overdetermination", Poster begins by arguing that print culture and the book operate on the basis of longstanding, though by no means static, relationships (between, say, figure and ground; authors and readers; and, to take another example, between 'truth' and 'fact' and 'fiction'). In consequence, the actual agency enabled by print (and other media) is extremely conventionalised: depending on our training and reading histories, we tend to fall into the semantic and social rules of the language games of how to make sense of a text. Thanks to centuries of institutionalising print and its affiliated kinds of labor, we have strong senses of what is possible for readers, what kinds of disruptive and transgressive readings are possible, what kinds of 'blanks' are to be filled in for print, but also spoken, cinema and televisual texts. In this regard, print, like TV, has become, in McLuhan's (1968) terms a "hot medium", which tends to be "high definition", leaving less immediate room and latitude for intersubjective agency by readers, viewers, and so forth. But we disagree with McLuhan that whether a medium is high or low definition, hot or cool is the result of its intrinsic characteristics as a technology, a claim developed by McLuhan from the prototypical Canadian communications theory of Harold Innis (1951). How and to what extent readers/viewers/users can and will assert agency has to do greatly with the degree to which the social practices and uses of the communications technology have been officially codified and controlled. This is a key lesson from the history of literacy education: that we can institutionally shape practices, constructing developmental hierarchies and skill taxonomies that are as much about disabling and constraining the use of a technology of inscription as they are about enabling new and innovative uses (Muspratt et al. 1997).

Drawing on Jean Baudrillard's (1988) concept of the *simulacrum*, Poster (1999) goes on to argue that new technologies disrupt traditional figure/ground, truth/representation, signifier/signified relations. In consequence, and because of the rhizomatic character of knowledge and related power relations, the Internet is a medium that enables a great deal of agency and free play among its users. This agency entails both new capacities to juxtapose, to ignore, to elide, to silence, and, to critique information that doesn't appear to be relevant or valuable or interesting – but as well new capacities to produce, change, alter, relocate and transform these messages. At this historical moment – given the current political economies and technological constraints of the Internet – the conventions for such literacies haven't been set in sandstone, or formalised in instructional events. Yet.

The kind of information processing and literacy described by Eisenberg and Berkowitz lacks strongly articulated practices of critique, and, relatedly, a strong sense of knowledge constructive agency. In terms of the former critique the American Library Association (ALA) fared a little better. Working in conjunction with the Association for Educational Communications and Technology, ALA developed a set of nine "information literacy

standards for student learning” (American Library Association, 1998). These standards are an attempt to define “best practice” for librarians and teachers. As excerpted from Chapter 2, “Information Literacy Standards for Student Learning,” the standards are divided into three separate categories: Information Literacy, Independent Learning, and Social Responsibility (see Figure 3).

<p><b>Information Literacy</b></p> <p>Standard 1: The student who is information literate accesses information efficiently and effectively.</p> <p>Standard 2: The student who is information literate evaluates information critically and competently.</p> <p>Standard 3: The student who is information literate uses information accurately and creatively.</p> <p><b>Independent Learning</b></p> <p>Standard 4: The student who is an independent learner is information literate and pursues information related to personal interests.</p> <p>Standard 5: The student who is an independent learner is information literate and appreciates literature and other creative expressions of information.</p> <p>Standard 6: The student who is an independent learner is information literate and strives for excellence in information seeking and knowledge generation.</p> <p><b>Social Responsibility</b></p> <p>Standard 7: The student who contributes positively to the learning community and to society is information literate and recognizes the importance of information to a democratic society.</p> <p>Standard 8: The student who contributes positively to the learning community and to society is information literate and practices ethical behaviour in regard to information and information technology.</p> <p>Standard 9: The student who contributes positively to the learning community and to society is information literate and participates effectively in groups to pursue and generate information.</p>
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Figure 3: ALA/AECT Nine Information Literacy Standards for Student Learning

The standards inform the reader that the student who is information literate “accesses”, “evaluates” and “uses” information “efficiently”, “accurately,” “competently” and “creatively.” Yet the statements are tautological and hence unhelpful as guidelines for either teaching or learning outcomes. Whilst there are references here to the possibility of critique and an appropriate recognition of issues of “social responsibility” and “ethics”, the learner is conceptualised as the passive recipient of information. No mention is made of students as active agents in the production of knowledge. The assumption that a student who “contributes positively to the learning community and to society is information literate and recognises the importance of information to a democratic society” is meaningless, if not dangerous, without some explicit recognition of the social, political and ideological construction of knowledge.

Despite the adoption of approaches to “critical literacy” in several Australian states in the 1990s (Muspratt et al. 1997), approaches to literacy of teacher librarians have lagged behind. In Australia, teacher librarians use the “Learning for the Future” document (Bennetto and Manning, 1995) as a blueprint for information literacy practice. Contrary to Eisenberg and

Berkowitz’s framework, this approach specifies that, though the steps are sequential, they are not linear (Bennetto and Manning, 1995, p. 20). Yet by comparison, the ALA document looks like a radical document. Accompanied by a teacher resource kit, the Australian approach utilises Eisenberg and Berkowitz’s “Big Six Skills” (see Figure 4).

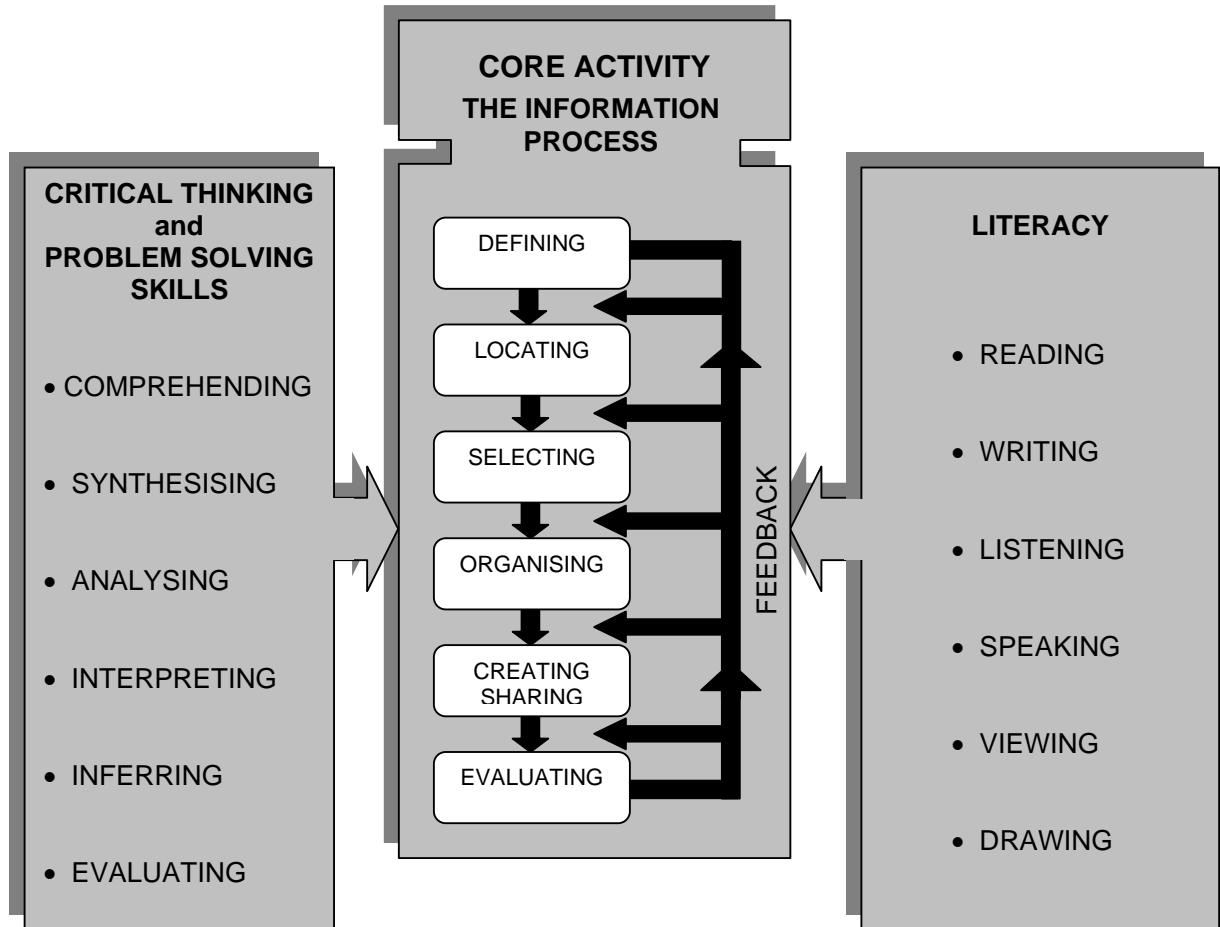


Figure 4: The Information Process (Bennetto and Manning, 1995, p. 20)

This framework reads very much like a list of higher order thinking skills derived from research on reading comprehension in the early 1980s. In this way, it fails utterly to come to grips with the new kinds of cognition, social relations and representations of new technologies – as well as reproducing a retrograde approach to print literacy. The matching column descriptions of reading, writing, etc. on the right predate attempts to describe the interrelationships of textual modalities, a challenge taken up by the construction of models of “multiliteracies” (New London Group, 1997). Nonetheless, it is this approach to information literacy that has shaped the curriculum and pedagogy of resource-based learning in Australian schools (cf., Booker, 1995, 1996; Cheek, Doskatsch, Hill and Walsh, 1995). Through conferences, workshops, multimedia professional development resources and library education programs, librarians are inducted into this method of information problem solving. They, in turn, train other librarians, members of staff and students how to use the “Information Process” as a strategy for information problem solving.

Australian librarians have affirmed that “the emergence of electronic information technologies and associated resources ... has required a change from the strategies traditionally associated with print resources” (Bonanno, 1997). Their attempts to envisage libraries of the future have drawn widely from discourses of business, neoliberal economics and government policy, and popular psychology. For example, in her revisioning of the teacher of the future, the National President of the Australian School Library Association claimed that “teacher professionalism” should be “maintained” through:

- ◆ exploring one’s unique human endowments as an educator;
- ◆ active professional networking;
- ◆ absorbing and digesting new knowledge;
- ◆ establishing an educational focus;
- ◆ establishing short, medium and long-term goals;
- ◆ developing a “self-employed” attitude;
- ◆ becoming “client” oriented;
- ◆ adding “value” to each educational experience;
- ◆ being enthusiastic, optimistic and persistent; and
- ◆ becoming a lifelong learner. (Bonanno, 1997, p. 10)

These strategies fall something short of a coherent educational response to the challenges of new technologies. The notion of “exploring one’s unique human endowments,” of being “enthusiastic” and “optimistic,” are echoed across the self-help and new age management literature. The librarian, like the student, is constrained merely to “absorbing” and “digesting” knowledge; the librarian is transformed into a “networking”, mobile professional. The formulation of short, medium and long-term goals, a “self-employed”, “client oriented” attitude, and “adding value” to the product reflect the principles and practices of managerialist discourses. Librarianship here is reconstituted as a service-sector, entrepreneurial form of labor. While such a redefinition is an understandable professional response to neoliberal educational and social service policies and practices, it sidesteps the fundamental challenge and possibility of the postindustrial reorganisation of librarianship as work. There is no mention here of the production of new knowledge and, crucially, of a critical practices of mentoring, teaching, and apprenticing others into engagements with technology, knowledge and power.

Many librarians, information media specialists and teachers would argue vehemently with us, claiming that the application of these skills will provide an “accurate” understanding and “effective” use of the contents of print and electronic resource materials. Across all of these frameworks is the view of information literacy as the foundation of resource-based learning. The approach is illustrated in Breivik and Gee’s (1989) influential text, *Information Literacy: Revolution in the Library*. The authors argue that learners must be able to distinguish “information” from “knowledge”. Their definition of information is as follows:

Information is but the raw material, the precursor of knowledge. Knowledge emerges from the distilling, shaping, and integrating of the raw material into concepts and rules, and in the process of condensation and generalisation, the number of bits of detailed information dwindles, rather than mounts. (Breivik & Gee, 1989, pp. 19-20)

This is Newton’s science. “Raw material,” “distilling,” “rules,” “condensation” and “generalisation” are the language of chemistry. In this particular schema for science, knowledge is external to the knower, existing as a thing-in-itself, independent of mediation

and interpretation. Seekers of “Truth” can track it down and capture it either in the confines of the library or in a limitless cyberspace.

We would argue that these emergent information literacy frameworks are part of the problem – at best anachronistic and dysfunctional, at worst counter-productive in their avoidance of the central questions facing students, teachers and librarians about:

- ◆ the social construction and cultural authority of knowledge;
- ◆ the political economies of knowledge ownership and control; and
- ◆ the development of local communities’ and cultures’ capacities to critique and construct knowledge.

These epistemological issues are not indigenous to new technologies, but hold as well in relation to print-based pedagogies and the framing and classification of school knowledge. They are indeed the persistent questions about ‘what should count as knowledge’, ‘for whom’ and ‘in whose interests’ raised by the new sociology of education almost three decades ago.

We have shown here that dominant approaches within library science draw their construction of the human technology-using subject, of her/his capacities and practices from cognitive, developmental and behavioural psychologies. Predicated on models of decontextualised, hierarchical and generic thinking skills, these versions of information literacy fail to consider the inherently social and political nature of language, text and the complex political organisation and distribution of information (Burbules and Berk, 1997). In so doing, such frameworks unintentionally perpetuate the epistemological positions and economic relations of students in relations to both dominant modes of information and official modes of school knowledge (Paechter, 1998). In consequence, students are being taught to ‘do’ a research methodology that, at best, is out of sync with cultural change and technological capacities and, at worst, lags behind their relatively unfettered agency at surfing the Net selectively and, perhaps, quite critically and cynically, away from the gaze of the teacher, the librarian and the assignment. It would appear to stand as yet another of the ubiquitous cases where students’ everyday competence with new information technologies is running in advance of our textbook paradigms for curriculum and instruction.

With regard to the technological genesis of the frameworks we have reviewed here, their print-based origins render them incompatible with the cognitive strategies of associative map-making and the nonlinear navigation of electronic materials. Our position is simple: that the “The Big Six” are obsolete because they embody assumptions of print culture and of a linear scientific method that are being superseded by other modes of inquiry, thinking and analysis currently being invented by, among others, students, researchers and scientists, teachers and librarians. The frameworks described here do not and cannot accommodate digital culture.

### **What is to be Done?**

Educational theorists, policy-makers and researchers have neglected the material and symbolic role of the library in the structures and economies of schooling. The epistemologies of New Times and the emergence of new technologies raise serious challenges for educational institutions, challenges that affect foundational assumptions about libraries. In an era characterised by the radical compression of space and time through digitised technologies (Harvey, 1989), it may seem anachronistic to speak of information and semiosis as “housed” somewhere. Yet the free floating signs and symbols, texts and discourses of the Internet, and of youth ‘World Culture’ in relation to education must come to material ground somewhere. There are still political economies, institutional sites, and face-to-face social relations where readers read, surfers surf, and programmers program. The school, the classroom and the

library continue to act as those institutional sites for the intersubjective mediation and regulation of the use of those texts.

We have argued here, that the new electronic communications and information technologies represent a radical shift in the way that knowledge is sought and taught, applied and re/produced in schools and institutions of higher learning. For the moment – and barring any radical changes in access, affordability, control, censorship for the next few minutes at least - these changes present challenges and new opportunities for educators. The window could close very quickly. The first principle of the current paradigm for libraries is “information”, and the time has come for the critical study of text and information to be integrated to the teaching and learning of subject areas and scholarly disciplines. Many of the theories and debates about and around New Times that we have raised may provide the grounds for a reframing of information science and informatics.

Computer mediated communication (CMC) already has had a significant impact on how we read, write, and think. Hypermedia and electronic information are changing what it means to know and what constitutes knowledge (Lanham, 1993). Electronic text mixes sound, music and image with print to the extent that the language/image ratio has changed altogether. At the same time, oral and visual traditions and conventions are being reinvented and hybridised. For example, text in forums such as email, internet relay chat, listservs and newsgroups exhibit many characteristics of oral culture. Furthermore, as Bolter (1991, p. 60) notes, “forgotten or demoted” technologies such as picture writing, mnemonics and oral poetry are moving back to the centre of writing, while what has been central for 500 years, viz., the “fixed and monumental page of print, (and) the book that exists in thousands of identical copies” are, in turn, taking a secondary role in many learners’ lives. At the same time, there is evidence that the iconography, interactivity and immediacy of hypermedia and CMC lend themselves to an inclusivity and the construction of new forms of community.

In the face of this, it isn’t as if teachers and librarians lack prescriptive models. Teachers’ manuals abound on how to have a “Web presence”, how to teach using the Internet, how to design electronic classrooms, and how to run information literacy workshops (e.g., Barclay, 1995; Metz and Junion-Metz, 1996; Mendrinós, 1994). Lists of websites and listservs, the ubiquitous FAQs and tips on Net searching and publishing, the subtleties of Boolean logic and proximity operators, and censorship and copyright issues are readily available. Yet the proliferation of such pedagogic techniques for searching, identifying and evaluating the authenticity, accuracy and validity of online materials described in the frameworks and textbooks reviewed here are at best necessary, though not sufficient. There is an emergent chasm between the information retrieval models currently used in libraries and a critical analysis of the emergent configurations of knowledge, discourses and social relations.

The professional literatures of the information sciences have yet to engage with critical literacies, and with the larger epistemological questions raised by new technologies and postmodern reconstructions of discipline, knowledge and identity. A critical approach to library research would appear to require a daunting paradigm shift within a professional group which, like the teaching profession at large, is generationally the product of a baby-boom, late print training. Yet both time and student agency are on the side of such a shift. Specifically, whether it is the children described at the beginning of this paper engaged in using the Web to write today’s research report on the Koreans, or the at-risk readers participating in computer-based ‘Fifth Dimension’ programs in libraries and community centres (Cole, 1998) – the critical potential of the media are being explored in ways that will force a reconnoitring of linear, print-based, pedagogical sequences in libraries and classrooms. What is needed is a critical information literacy training that begins from three core assumptions:

- ◆ that the texts and knowledges of the new technologies are potentially powerful sources for shaping students' beliefs, practices and identities, and indeed that students will require critical perspectives and strategies for repositioning themselves in relation to these texts and knowledges;
- ◆ these texts and knowledges are not pre-existing, waiting to be discovered and documented through library work. Rather, they can be co-constructed by the student in a mediated dialogue with other times and spaces, texts and identities – both real and virtual. In this way, libraries can be sites where students can use these same technologies to actively and critically construct, shape and negotiate knowledge, practices and identities; and
- ◆ in so doing, a critical information literacy can encourage and enable learners to systematically reposition themselves in relation to dominant and non-dominant modes and sources of information.

These are the assumptions that would underlie a 'new basics' – and they provide us with means by which critical literacies and multiliteracies can be presented to parents, community organisations and employers, who are as concerned as educators that their children have the capacity to use information technology in dialogic, agentive ways that enable them to critique and create knowledge. The very assumption that secular schooling systems and educational policy requires canonical, acritical approaches to the press and to dominant textual cultures is but one of the assumptions that has been, quite productively, destabilised by new technologies. The notions of 'critique for all' and 'dialogue for all' as new basics have significant appeal when the object of critique is not necessarily, but could be, *Pride and Prejudice*, but rather the nutty political webpage that anybody can access at home, or the 1000 versions of Korean history that the student reporter must navigate.

Our analytic focus here is on one key spatial and institutional location where new literacies are being constructed, negotiated and regulated: the library. Whether and how the library continues to exist in educational policy and pedagogic practice as a physical site for the archiving of texts or the teaching of literacy events is not our worry. We are concerned with how these new digitised literacies are redefining the library. The educational challenge is nothing short of the digital reconfiguration, relocation and critique of the textual archive.

## Notes

- [1] We make this claim in spite of the ostensible "backlash" in American universities that claims that armies of feminists, postcolonialists, multiculturalists and poststructuralists have somehow grasped control of the modes of information and means of production of knowledge. A simple perusal of any university catalogue, high school syllabus, or attendance at an academic senate or school board meeting of most institutions in the English-speaking "West" would indicate that such claims are political artefacts rather than immediate responses to any substantive shifts in knowledge and power within institutions. Postmodernism certainly hasn't influenced high school training in physiology, or most university training in foreign languages, engineering or chemistry. Nor has it deconstructed the Dewey Decimal System.
- [2] Specifically, these include various attempts at curriculum negotiation including constructivism in science and mathematics education; problem-based learning in the social, physical and biological sciences; and critical thinking and radical pedagogy.
- [3] The arbitrariness of the alphabetic organisation of world knowledge, and of the authority granted to that knowledge was the object of Flaubert's late satires, *The Dictionary of Accepted Ideas* (1968) and *Bouvard and Pecuchet* (1979). It is notable and relevant to

contemporary debates over the power of elite, popular and scientific cultures, that Flaubert's later work shifted from a critique of the power of popular romantic fiction to the critique of the power of science, pseudo-science and academic knowledge over peoples' everyday lives and conceptions of the world.

[4] See *Literacies and Technologies in School Settings* in this issue.

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