New Literacies - New Media:
Mediascapes and Infoscapes

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Introduction
What is literacy in the age of globalization, multimedia, semiotic and information economies? My theoretical position on literacy is framed within within three broad areas: (i) poststructuralism, (ii) theories of cultural globalization and (iii) the history of communication. First, I take a Foucauldian poststructuralist perspective which considers 'truth', knowledge, and the social subject as historical constructs that are enacted and lived in specific socio-cultural sites. By extension, concepts of education, the educated individual, literacy or what counts as schooling or school knowledge are also historical, culturally produced and mediated. Second, I agree with Robertson (1992; 1995), Featherstone (1995), Dirlik (1996), Hall (1996), Appadurai (1990) and others who argue that there is something fundamentally different about the world today and peoples' experience of that world. That different trope and empirical reality now heralded as globalization, as distinct from postwar internationalization, must be analytically and conceptually approached in all its variability: that is, its cultural, economic, philosophical, political, technological, and social dimensions, and the hybrid or 'third space' or 'trans' localities, practices, individual and community identities it gives rise to. Third, new communication media, orders and practices are at the core of globalization trends: that is, they enable and create global networks of ideas, finance, capital, commodity, markets. The book shaped knowledge in certain ways. It foregrounded and legitimated the linear logic of writing – a distinctly European logocentrism – authorized 'the book' as site for 'truth' and the authority 'the word', and created a new economy of power around (book based) knowledge and literacy. Similarly, today's new e-technologies are reshaping the organization of knowledge (from page to screen, from sole reliance on print to text-image fusions), remediating power relations mapped across networks of uneven distribution and access, and remaking literacy and, indeed, language itself.

The history of communication and technology – from the work of Lewis Mumford (1934/1962) to Marshall McLuhan (1962) – has taught us that technologically mediated human experience is as old as civilization itself. The signification system of the alphabet combined with the medium of lightweight papyrus, later the codex, velum then paper, ushered in a new era of standardized script. After romanization, alphabetic script encoded on a portable and lightweight medium would eventually lead to greater 'international' renaissance and exchange of knowledge, the increasing control over space (e.g., expansion of the Holy Roman Empire, 'new world' colonization and territorial administration) through the global transportability of standardized laws, navigational charts, and so forth (cf. Luke, 1989). The (landline) telephone, the car, the train, electric light or hearing aids, pacemakers, or the innumerable medical technologies that sustain, and now create, life have already been with us for a long time. Historical understandings and uses of technology are culturally embedded, never static but always in flux. Importantly, although not a new revelation, culture, language, technology, social organization, as well as the social organization

around knowledge (whether in oral, hieroglyphic, alphabetic, or typographic cultures), co-constitute, cross-reference, and transform each other – often imperceptible over decades or centuries and sometimes, as is the case with the current 'digital revolution', with rapid, catapulting speed. Any previous age – the renaissance, the 'age of discovery' (or, 'age of invasion' when seen from the vantage point of the discovered, the colonized), the industrial revolution, the postwar 1950s or cold war 1960s -- was itself the product of dramatic cultural and language shifts, the blending of new ideas, knowledge, and technological innovations with the old.

Yet, what is historically different and unique about the contemporary moment is the global scope and rapid acceleration of change. In the midst of this 'revolution' it seems that we barely have time to acquire and master one technology and evaluate its social and educational impact before the next wave of technological innovation has made current products and skills obsolete and the social consequences of uptake have leap-frogged ahead. Research is not keeping up and, consequently, much of what goes on in classrooms around ICTs remains a hybrid assemblage of teacher *bricolage* – a teacher constructed mix of established teaching strategies and expected learning outcomes and a range of variable IT pedagogical strategies that teachers make up themselves or else adapt from the occasional in-service workshops. In fact, what I and many of my colleagues teach about IT and new literacy skills, is itself a blind guess although it is based on current research. Nonetheless, it is a mix of what we think we ought to be teaching, framed within the software and hardware limits of what a university provides, in the context of university computer labs with class size limits and protocols in terms of what students can access, and within the (45 minute) time slots of university timetables. We devise course content and pedagogy in line with what we think 'generic knowledge' or 'meta skills' might be for students who may well end up in jobs that don't yet exist, or who may face 'new age' classrooms and technologies not yet developed and for which our current training cannot prepare them.

That said, this paper presents two domains in which to situate a concept of multiliteracy. I use Appadurai's (1990) concept of 'scapes' to track what he and others (Castells, 1996; Kress & Van Leeuwen, 2001) have called a new world order -- a new communications order -- which is both cause and consequence of globalization. I consider mediascapes and technoscapes and to map the multi-faceted dimensions and shifts of traditional (print) and new and emergent literacies. I begin with an introductory overview of current arguments in support of multimodality and multiliteracy in the context of changing definitions of literacy. I then outline the core principles of a pedagogy of multiliteracy before returning to a more detailed exposition of each of the scapes.

Multimodal multiliteracy
Long before the advent of computers, the internet, or debates on multiliteracy, mass media texts such as TV, movies, cartoons, or comic books

have always been children's first curriculum (Luke, 1997, 1999b; Luke & Bishop, 1994). Children learn their "M" from McDonald's golden arches, from the print and imagery of puzzles, games or Happy Meal promotions on McDonald's placemats, "B" stands for Barbie, or the letter "S" brought to you by *Sesame Street*'s Grover, Elmo, or Big Bird. Moreover, all of us – including youngsters long before they start school -- are practicing semioticians who navigate everyday life by decoding and encoding signs. Young children respond to gestural semiotics from a parent's frown, smile or hand clapping to hand gestures signaling 'yes' or 'no', 'come here' or 'don't touch'. Kids learn about red and green traffic signs long before they can write 'stop' or 'go'. When driving, we respond to symbolic information on the dashboard, to traffic signs, we may read billboards, listen to the radio, talk on the cellphone or the person next to us, all the while 'reading' and interpreting the multiple and simultaneous information cues that pass us by in rapid succession. In short, we draw on multiple and simultaneous semiotic information sources and draw on a range of knowledges to manage everyday life.

Historically, definitions of literacy have been book and print based and decidedly monocultural. Normative definitions generally claim that literacy entails competence in a culture's symbol and communication system for productive participation in that culture and society. However, I would argue that competence in one culture's symbol system is no longer sufficient in today's world of globalized consumerist, media, image and information flows. Contrary to Kress's (2003) position that (western) concepts of literacy ought to remain fundamentally linked to the resources of writing (as *the* core practice of meaning making), I would argue that literacy today must be more than writing and reading competence in a culture's script, facility with normative orthography or grammar, or knowledge of a culture's selective tradition of canonical 'great works'. In a global supermarket of transnational 'branded' culture, symbols and so-called information or knowledge economies that 'time-space' travel on global communication networks across 'old' cultural borders, competence in one culture's symbol and communication systems is clearly inadequate. The role of ICTs in mediating language(s), communication, representational modalities of 'text', knowledge, and people's identities and social-communicative relations is crucial and cannot be side-lined as something distinct from literacy *qua* writing. Similarly, the advent of typography and book culture cannot be separated out from the subtle shifts in reading/writing practices that followed (McLuhan, 1962), or the long debated links between 'the word' in print in the book to larger epistemological shifts (Foucault, 1970; Goody, 1987; Hacking, 1982; Luke, 1989).

It is now widely accepted among educational scholars that literacy is historical, social, and developmental. Concepts of literacy have differed historically whether in oral, alphabetic or typographic cultures (Cope & Kalantzis, 2000; Lankshear, Gee, Knobel, & Searle, 1997; Luke, 1989). What counts as literacy in one era invariably changes in another era according to prevailing ideologies and educational ideas. Literacy is not a universal,

ahistorical or asocial artifact of any culture. It is both a social construct and social practice enacted in social networks (of schools and communities) and social relations (among students, teachers, parents). Literacy instruction is a massive schooling effort involving teachers, teacher training, administrators and bureaucrats in educational departments, curriculum developers, policy makers, and not least academic researchers. Beyond the business of schooling is a massive textbook and, more recently, digital publishing industry. It involves parents and caregivers who are part of the social network of schooling, and who not only spend many years engaged in supporting children's literacy development through homework, reading and writing at home, but who are also seen as both the source and solution to the problem of 'illiteracy'. Finally, literacy is developmental, fluid and open-ended. Literacy has no endpoint: one doesn't 'finish' literacy development once the alphabet or other scripts are learned, once one can read past the word, clause, sentence, paragraph, an entire chapter or book. Literacy is a life-long cumulative process. It is applied and modified and conjunction with literacy demands in other contexts, with other media, symbol systems, images and other languages. Literacy develops exponentially across media, modalities and other language and sign systems.

It is fair to argue then, that today much of the over-developed and developing world is transiting from exclusive print literacy to digital multimedia and multimodal literacy. In today's information environment, we draw on multiple sources of information simultaneously – from print and imagery, to a rapidly expanding lexicon of symbols, sounds and acronyms. For instance, we now take for granted the kind of print and iconic literacy required for the most basic transactions at ATMs (automatic teller machines). We increasingly engage in multiple communication exchanges whether we are on-line, communicating via real-time chat or monitor mounted webcams, talking on the cell phone or landline phone, alongside face-to-face talk (while the TV or radio are on in the background). In this mixed media environment we activate literacy in multiple modalities and manage a mix of different symbol systems whether on our software, the interface, the webpage or the cellphone which now transmits 'live' pictures and movie clips. Imagery is embedded in print which is further overlaid with acronyms (http, url, faq, www) or emoticons -- the ubiquitous language of 'smilies' :-) ☺.

Importantly, we have to remember that the generations coming through school today have already grown up with electronic toy discourse, with years of playing hand-held electronic games, video, CD or web-based gaming, and years of TV watching (Luke, 1999b). As traditional entertainment media (e.g., TV, movies) begin to converge with CD-ROM, internet and mobile phone technologies, we need to expand traditional critical media studies to incorporate the new technologies. Many educational scholars have long argued that, as media change, so must our approach to teaching the basics of critical media analysis (Alverman, Moon, & Hagood, 1999; Bruce, 1998; Buckingham, 1998; Buckingham & Sefton-Green, 1994; Gee, 2000; Pailliotet & Mosenthal, 2000; Reinking, McKenna, Labbo, & Kieffer, 1998; Semali, 1999; Watts

Pailliotet & Mosenthal, 2000). As more children each year access the latest Disney versions of children's classic narratives on the web or on CDs, the importance of applying critical media analytic skills to issues of representation should not be underestimated. In other words, kids come to school in many ways already socialized into a multimedia, multimodal literacy (Luke, 1999b, 2001). And yet this may be the very phenomenon of generational difference – of a generational digital divide between students and teachers. It may be the root cause of panic and resistance to new ways of looking at literacy among educators trained in the culture and sanctity of print and the book. In this digital divide, that Green and Bigum (1993) have referred to as "aliens in the classoom", students see their teachers as aliens from another time, trained in the culture of the book, monologic literacy, specialists in one disciplinary content area and many struggling with the new technologies. Teachers, in turn, see today's students as alien digi-kids – wired and plugged in, speaking a 'foreign language' of ICT acronyms and insider technical know-how. And although there is good reason to be mindful of the commercialization and consumerist ideologies embedded in the new e-learning products that are marketed as educational toys and CDs, on websites and search engines (Farbos, 2004), we should not romanticize or fantasize about the alleged objectivity or value-neutrality of the traditional school textbook and book-based pedagogy (deCastell, Luke, & Luke, 1989). I now turn to outline two domains of mediascapes and technoscapes in which to situate a concept of multiliteracy.

Flows and Scapes
Appadurai (1990) argues that globalization can be characterized by accelerated multidirectional, conjunctive flows of people, information, media images and consumer dreams, technologies, ideas and ideologies that connect people, cultures and knowledge in new ways. These flows create new technologically mediated social relationships, new rules of social conduct (e.g., netiquette) and cultural exchange, new workplace environments (where the old distinctions between the public space of work and the private domain of home are melting as more people work electronically from home), and not least new kinds of literate practices. These multidirectional flows (whether of people, ideas/knowledge, signification systems, culture, or finance) generate new combinations, contradictions, and transformations. Such mixing or blending has been variously referred to since the early 1990s by postcolonial and globalization theorists, social geographers and sociologists as hybridization, hybridity (Featherstone, 1995; Pieterse, 1995), or 'third space' (Bhabha, 1994; Soja, 1996). Linguistic and cultural hybridization have been at the forefront of scholarly scrutiny with specific emphasis on identity politics at the level of the subject, community (i.e., ethnocultural groups) or 'nation' – in short, Appadurai's ethnoscapes.

Mediacape generally refers to the global tentacles of mass (*broad*cast) media which, despite convergence (e.g., net TV and radio; movies on demand; CNN weather or stock reports direct to our cellphone or email) and the drift toward interactive narrowcasting, remains the dominant and most accessible

form of entertainment and ideological hegemony for the bulk of the world's population. In the most remote or destitute corners of the world one is sure to find at least one TV screen in villages aglow with Toyota and Coke ads, re-runs of old movies, talk-shows or soap operas. TV genres of old have disappeared in favor of new hybridized genres: news programs maintain audience share as *infotainment*; the historical or social documentary is embellished with fiction and turned into a *docudrama*; the drama is part serious part comedy or *dramedy*; educational programs are produced in the form of other genres (e.g., quiz shows) that provide *edutainment*; the editorial that tacitly advertises a product or service as an *advertorial*. And it is not only the American dream factory that blankets the globe with cultural products in movie theatres, TV, and with local and international versions of *Cosmopolitan*, *Newsweek*, *Time* or *Marie-Claire* and *Elle* on news-stands. The 'west to the rest' media flow mingles with the east to west flow of Hong Kong and Indian 'Bollywood' media products that are international blockbusters, broadcast on local ethnic TV stations in metropolitan centers and available in ethnic neighborhood video rental stores across the globe. Given the substantial amount of time young people everywhere spend with mass media and new media, it is imperative that in a media saturated world kids know how texts, images, and symbol systems position them, shape their worldviews, values and identities, their aspirations and desires. This, then, is the domain of media literacy.

Technoscape refers to the new information and communication technologies (ICTs) that have created historically unprecedented networks of global connectivity. Granted, as in any era, new technologies are initially accessible and affordable only for a small percentage of economically advantaged groups in affluent nations. The book or the telephone, like the automobile or TV, were initially accessible only to the elite. In due course, as the history of communications has taught us, technologies filter down to the masses as mass production makes products more affordable. So too, the latest techno-gadgets remain in the hands of the few while the rest of society settles for less sophisticated, often outmoded computers, limited memory, capacity and connectivity. Nonetheless, ICT diffusion globally has been rapid and unrelenting (Hawisher & Seife, 2000). Computers have been in schools – with various levels of dissemination, use, infrastructure and support – since the late 1980s and kids have had increasing access to computers at school and at home. Changes in teaching to accommodate computers and connectivity – albeit uneven across and within schools – have exposed teachers and students to new media, new ways of accessing and exchanging information, new textual and visual forms, new pedagogies and new problems (Bruce, 1998; Lankshear, Snyder, & Green, 2000; Snyder, 1998).

Today, only twenty years after ICTs began tentative incursions into schools, we have leap-frogged from visions about wired connectivity to the wireless classroom, school or campus. What began as multiple media or multimedia – separate and discrete communication and information hard and software – has converged into information/communication hubs, increasingly more

portable, mobile and miniaturized. The mobile phone now connects to the internet, desktop or laptop, functions as a digital camera, MP3 player, radio, games console, and provides email, chat, and multimedia streaming. A whole new grammar and literacy – alphabetic, iconic, semiotic, multimedia mixes – have sprung up on cellphones and, as usual with new technologies, kids are leading the way in 'writing/tapping' the new literacies, let alone in speed texting. One of the key issues related to ICTs and literacy are newly emerging iconic and symbolic languages of communication which are rapidly replacing traditional orthography and syntax. This, then, as I will argue in a later section, is the domain of techno-literacy.

Together, then, mediascapes and technoscapes, are not only useful conceptual metaphors, but instructive domains for analysis of multiple and emergent literacies that are integral to kids' everyday experiences, at which they are 'experts', and yet which official school curriculum and literacy pedagogy generally ignore. I would argue that it is pedagogically irresponsible to ignore those texts and images which are central to kids' lives today. It is indefensible that educators should fail to give students the critical and analytic tools with which to fully understand the politics of meaning, how text-image positions us and shapes our values and worldviews, especially in this age when social relations, communication, consumption, learning, work and play are situated in and mediated by a dense intertextual network of semiosis, iconography, image and print.

Pedagogy of Multiliteracy
The baseline of a multiliteracy pedagogy insists that educators engage students in a critical dialogue with capitalism, globalization, commodity culture, cultural difference and diversity, patriarchy and gender politics, and so forth (Cope & Kalantzis, 2000). It's about getting students to look at themselves (identity) and others in self-reflexive and critical ways: how text/image creates preferred and counter 'reading' positions; how it teaches us lessons about others (e.g., consider the global roll-out of a virulent 'them' and 'us' discourse following the September 11 terrorist attacks); how we use text/image to position others, to get things done, and so forth. A critical multiliteracy pedagogy, however, is not only about 'deconstruction', about decoding message systems into micro-components, but it is essentially about encoding as well (cf. Unsworth, 2001). That is to say, in an educational context, all teaching invariably ends up as (student) production – whether the test, essay, art work, webpage, or the scientific report. In short, analysis and deconstruction always channel into reconstruction, the production of a project or curricular unit of work that goes beyond the reproduction of normative school knowledge. In that regard, the model runs on five axes of practice: (i) Available Design; (ii) Situated Practice; (iii) Overt Instruction (iv) Critical Framing; (v) Transformed Practice.

We begin by taking available 'designs' or resources (genres, discourses, conventions, codes, etc.), and link those to situated practice which refers to students' local context, environment, experiences and knowledge that are

meaningful to them in their communities of practice. Overt instruction provides students with the microanalytic and metalinguistic or metaconceptual tools for critical analysis after which we then move students to the stage of critical framing. Here they stand back from what they are studying and view it critically in relation to its context. They take theoretical distance in order to critique, to account for its cultural and/or historical location -- its intertextual referent.

Next, students extend and apply their critique and 'new' knowledge and understanding to another context. That is, they innovate and create on their own which is the final stage of transformed practice. This is the stage of designing a 'new product' – it is transformed meaning making practice in a new context, or the application of new knowledge and new meaning making skills to the design of a solution to a new or old problem. All of us including students are in the business of designing – designing answers, a course of action, drawing from a vast cross-disciplinary pool of knowledge (or facts) in the design of solutions to problems, responses to situational demands, and so forth. Even the standard literary essay at the end of a course, end of chapter, or on the test, requires that students design a response, design an argument, design a structure or framework into which to fit the knowledge or facts the teacher is after. In other words, the notion of design underpins (student) text production and (teacher) pedagogy. We teach normative conventions, provide critical tools, and then ask to students to design and create knowledge webs, rather than linear print prose. This approach begins to open up the possibility for the construction of (student) knowledge that is 'web-like', rhizomatic, interdisciplinary and which requires an understanding of meaning as fundamentally polysemic and intertextual (Luke, 2000a). The course content and assessment is based on this model of multiliteracy pedagogy and it is also the first theoretical framework we teach. This is then followed by in-depth explication of the two literacy scapes which I discuss in detail next.

Mediascapes
One of the basic principles of any educational program, any curriculum, is to 'start with the child'. And what better point of entry into young people's background knowledge than to focus on the texts of everyday life that kids grow up with. From infancy, most kids are immersed in the texts of media and popular culture which shapes their understanding of the world and of themselves, of good and evil, heroes and heroines, gender, cultural difference, or social power. Media and popular culture shape the child's early entry into consumption and narrative by being located in the centre of family life, and by assimilating and cross-referencing to other narratives and commodity forms (Luke, 1999a). Consider, for example, that many preschoolers learn their numbers and alphabets from *Sesame Street* TV programs, books and CDs, from McDonald's placemats, from internationally syndicated children's TV programs such as *Bob the Builder*, *Barney* or Australia's *Playschool*, *Bananas in Pyjamas*, or *The Wiggles*. These program's websites sell everything from CDs, sunscreen, t-shirts and pyjamas to

mousemats, watches, sunhats, and an even larger array of these TV program-based toys and gadgets are on offer in globally franchised toystores around the world (Kinder, 1991; Klein, 2001; Kline, 1993; Seiter, 1991). Buying into the media discourse is only a mouse-click away and a virtual shopping cart is always handy. In other words, the jump from narrative to commodities is totally 'natural' and naturalised because it is the everyday fabric in which childhood occurs, and in which parents collude and experience childhood with their children.

Parents are the vital link between media texts and media commodity spin-offs since very young children do not have the financial authority or skills to purchase on-line. It is parents who take their youngsters to, for instance, McDonald's and purchase the latest cups or action figures that are marketed through the fast food chain following the release of the latest blockbuster kiddie movie. It is parents who buy the latest advertised peanut butter or cereal that kids insist on; buying the product that children demand is often an easier option in order to avoid public family battles in the supermarket. Parents, not kids, line up at toy-stores the night before the latest release of new *Playstation* software, the latest *Spiderman*, *Harry Potter* or *Lord of The Rings* action figures or games. McDonald's birthday parties mark important milestones in a child's and family's history and this is a global phenomenon. Parents spend billions on toys, children's entertainment, designer label clothing (GAP, Nike Kids, Barbie, etc.) and these cultural artifacts become integral and 'natural' aspects of childhood and family life (Sefton-Green, 1998). Shopping, mealtimes, birthdays, parent-child relations and interactions, are mediated and structured by an increasingly global commodified media culture which constitutes the lived reality and material relations of everyday life between parents and children. Young children acquire at least part of their early (print and visual) literacy in this global, intertextual network of interconnected media, popular culture and commodity discourse.

In a global universe of intertextual and interconnected media, popular culture and commodity discourse, kids acquire global *and* localized cultural narratives, social values and, not least, literacy in often imperceptible ways. The texts of everyday life provide instructive public pedagogies that shape young people's identities, desires, and worldviews (good vs. evil; cooperation and competition, etc.). For teacher educators inducting new generations of teachers and for educational researchers, these texts provide critical insights into the social construction of childhood and adolescence, literacy, globalization, localization (Kellner, 1995). The texts, images and practices of media and commodity culture are sites of the crosscurrents of mediascapes and technoscapes.

Technoscapes
Arguably, one of the most fascinating new developments in literacy, communication, and language change are the new information and communication technologies (ICTs). For the most part, ICT educational

research and curriculum has fixated on a simplistic pedagogy of front-end user skills: the teaching of web navigational skills, word processing, spreadsheet, or browser search skills. 'Crititical information literacy' skills generally remain limited to data search and collection skills, facility with multimedia software (e.g., Flash Animation) for incorporation into student projects, or rudimentary hypertext evaluation skills (e.g., verifying author source to validate authenticity; checking a webpage's last updating or the number of 'hits' to verify its relevance and currency) (cf. Burbules & Callister, 2000). Contrary to this normative approach to information or technology literacy, I have long argued that we should not merely use ICT to teach, but teach *about* ICT: 'new' media's impact on knowledge, social relations, literacy, pedagogy, identity, and language change (Luke, 1999a, 2000b, 2002).

Consider email – the most ubiquitous form of the new e-communication order. In contrast to claims that email has degraded writing, grammar and social protocol, it has in fact generated an explosion in writing – the biggest boom in letter writing since the 18th century (Kramarae, 1995). While email tends to encourage shorter messages, it also means that we are writing more economically and more often. Communication environments where speaker-writers are invisible – whether chat or email – can be more inclusive because visual cues (of race, gender, physical appearance) and oral cues (of dialect, speech impediments, or second language speakers) are absent (Luke, 1996). Hence, students who are often marginalized in face-to-face classroom encounters because of their visible markers of difference, are more readily included in 'invisible' communications forums where the culturally value-laden habitus of race, gender, age, body shape, speech, or dress don't matter.

A multiliteracies perspective applied to new media looks beyond the obvious, the given text-imagery modalities of flashy web pages, interfaces, and software programs. A whole new web- and software-based vocabulary has emerged which, in itself, constitutes new literacy practices and requires critical attention -- whether one is engaged on-line or talking over coffee about bits or bytes, bauds or bots, squatters or sigfiles. Entirely new symbol systems have emerged in the last decade, developed by front-end users – mostly young people – *not* language experts. These new 'grammars' have become the principal communications mode among young people on email, mobile phones, personal digital assistants or palm pilots. For example:

☺ BDAY. RU XLNT? BCNU, DNT B L8. :-X
[happy birthday. are you excellent? be seeing you. don't be late. kiss].

Consider how quickly and subtly computing discourse has generated language change and infiltrated everyday language use (Shortis, 2000). Acronyms (e.g., ftp, www, http, html, CD, RAM, ROM, etc.) have taken on the function of verbs and nouns. Few of us refer to a CD as a compact disk, or refer to a url web address as 'uniform resource locater'. New words have

emerged (e.g., emoticon, hypertext, email, snailmail, dot.com) that have rapidly become integrated into everyday language use. Netiquette (internet/net + etiquette) is already a well established term with which most people are familiar; indeed, most universities have netiquette policies for staff and students. The term 'cyber' or letter 'e' now prefaces those words that denote activities that have moved online: from 'e'-banking to 'e'-learning, from cyberspace, cyberpunks, cybercafe, to cybercash, cybersex, and cyberschooling (Luke, 1996). At my own university, our library is the *Cybrary* and our librarians are *Cybrarians* (see http://www.library.uq.edu.au/).

New blended terms have emerged (e.g., netiquette, netizen, hardcopy, upload/download, cybernaut) not unlike a raft of new words that describe emergent hybrid genres of mass media (e.g., infomercial, docudrama, advertorial, dramedy, edutainment). New compound words distinguish between types of functions (floppy drive, hard drive, CD-drive, zip drive) and objects (software, shareware, freeware, nagware). The *tele*phone or *tele*vision are earlier forms of lexical hybridization signifying activities conducted from elsewhere, from afar. What is new linguistically in networked ICT discourse is the construction of linguistic hybrids joined by a full stop such as dot.com or net.users.

'Old' words are imbued with new meanings (e.g., browse, browser, bit, boot, button, flame, cache, wired, virus buster, home page, hard drive, etc.). Cookies are not always what we eat, buttons and boots are not necessarily what we wear, bullets aren't only meant for weapons, and a hard drive does not mean 'petal to the metal' on the open road. Some relatively 'new' words work double duty as nouns and verbs. A fax (formerly facsimile) works as a noun and verb (to fax) and email (formerly electronic mail) also functions as noun (an email) and verb (to email). Adjectives have transformed into nouns: we use 'floppy' as noun to denote a soft data disk which used to be known as a 'floppy diskette'. Aside from the familiar 'vocabulary' of emoticons, a whole new symbolic and linguistic code for electronic communication has emerged which has become part of everyday literacy practices for anyone using computers. When we upgrade or buy new computer software or hardware, or peripherals for data transfers (whether phone, camera, or notebooks), we talk of 'bit', 'byte', 'baud', 'mb' or kb'. Iconic symbols for computing functions are part of our everyday semiotic vocabulary:

Although many of these symbols (like global traffic signs 'stop', green for go, red for stop, and amber for caution) are universally recognized, a critical multiliteracy gets students to question the underlying assumptions and epistemologies of what are clearly western signifiers. Electronic reading and writing practices are framed within these meaning systems that suggest not only new symbolic languages – iconic grammars -- but also potentially new

forms of cultural imperialism (Luke, 1996). A critical ICT literacy encourages students to develop critical lenses with which to see and discuss such politics of meaning.

New forms of literate practice are not simply a matter of technology: a kind of hardware and software determinism that prescribes people's communication and information management skills. Rather, technologies always emerge as products of specific cultural practices, literate traditions, and the interests and desires of those groups who design and name them. Just as early mechanised print technology in the 15th century emerged in hybrid form as part scribal part print discourse, so the language of ICTs has developed as a blend of print text, sound and graphic imagery: a hybrid of the language of the book and the language of computer technology. Consider the following hybrid forms of meaning that signify new forms of hypertextuality. Book-based practices and the naming of these practices are changing: "click" or "double-click" is replacing "turn the page". The term "bookmark" is a common menu option for clicking on and recording a world wide web site address (url) -- that is, putting an electronic "bookmark" where there is no book in the traditional sense of the term. The "home page" refers to the opening screen display of a www site or "document". Yet the "document" or hypertext, which consists of "pages" and can be "bookmarked", is itself paperless and pageless. We "scroll" down an electronic page which references to the unfolding of a codex or renaissance scroll. The electronic "desktop" is the interface between the phenomenal and the virtual, the material and the symbolic, from where we launch ourselves through our textual constructs from our "desks" into an electronic realm of pure information. Our 'desktop' is neatly organized with 'files', 'folders', 'scissors' ✄ to cut and paste, binoculars, magnifying glass or spectacles ᛞ to help us find information, trash bins or the more environmentally kosher recycle bins to receive our garbage, and office assistants to sort out our mess.

Issues of language change are always issues of cultural change. A critical media literacy goes beyond ideology critique of a text, a TV program, a software program or website to attend to these larger metadiscourses of historical change. Investigations into ICT imagery and metaphors, and the patterns of linguistic change linked to new and old media can be fascinating projects for students that demand interdisciplinary thinking and linking: from history to science, technology to culture, linguistics to media. Such practical work provides insights into how the development and social uptake of ICTs is shaped by history, socio-cultural contexts, and residual media of scribal-book culture.

A critical multiliteracy challenges students to think about these dramatic changes in representational forms, language, 'textuality', and human communication. Students must be given opportunities to discuss and reflect on whether the new symbolic iconic 'grammars' are a lesser or merely different form of reading and writing. Rather than focus merely on the

teaching of operational skills, students ought to be taught the meta-analytic tools with which to debate what these new communication 'scripts' and social orders (Kress & Van Leeuwen, 2001) imply for literacy education, pedagogy, knowledge, new jobs in new work orders, and intercultural communication (Kymlicka, 2003). A critical socio-cultural and historical perspective on traditional communications media (from oral to alphabetic to typographic culture) in different cultural contexts can enable students to understand more fully the complex changes underway today. As future teachers, it is imperative that education students develop a balanced and informed perspective on the so-called information revolution to avoid falling into an either/or position of blind acceptance or blind resistance to the new technologies and the new realities of upcoming generations of young people who are experiencing the world in radically different ways than their print-generation trained teachers.

Having grown up in a world of connectivity and immediacy, of "digital fun and games" (Nixon, 1998), children's entry into knowledge-in-boxes curriculum, into disciplined "on task" cognition and a school culture of hyperindividualism and deferred gratification (e.g., 'testing', grades) can create the kind of generational divide that Green and Bigum (1993) have referred to as "aliens in the classoom". Students see their teachers as aliens from another time: trained in the culture of the book, monologic literacy, specialists in one disciplinary content area and many struggling with the new technologies. Today's youngster is a savvy citizen of the digital age. She's seen *Harry Potter* the movie, read the book, has the DVD and several *Potter* e-toys, and Hogwarts jump across the screensaver on her kids' size digital organizer or mobile phone. For kids who have grown up with Walkman, Gameboy, cell phones, internet and console gaming, 'real life' is online. Information, ideas, cultural icons, social connections cross-reference and flow into one another in an intertextual multimedia and multimodal network in which (middle class) kids' experience and knowledge of the world, their identities, literacy practices and learning. The point, then, for teacher educators is that it is not solely a question of technology integration into the classroom and developing appropriate teaching and learning strategies to suit the new media. Rather, a critical multimedia and multimodal literacy ask the larger questions of epistemology, the politics of knowledge, new economies, identity politics, (in)equity of access, and historical transformation.

Concluding Comments

In the context of the broader description I have provided here on the incorporation of a multiliteracies pedagogy into one course in a teacher education program, clearly a monomodal, monocultural concept of literacy is untenable in an increasingly globalized social world. To invoke American educational philosopher John Dewey's famous axiom "start with the child", it is in my view a social and educational responsibility to build on the variable background knowledge and resources that children bring to the classroom and to provide all students with the most up-to-date skills, knowledge, and learning strategies informed by current educational theory and research, and to adapt and modify these to suit situated practices in specific cultural

contexts. Hence, the need for 'critical' and functional ICT skills that students will need for jobs in five, ten or twenty years' time – jobs that have yet to be invented – is at minimum an argument for educational policymakers and curriculum developers to move out of 20th century preoccupations with print and the book as the only 'true' and most authentic source of knowledge, meaning, and literacy.

Beyond school, so much of everyday life has already migrated on-line. Clearly educators have a responsibility to teach this and subsequent generations to ask the critical questions of the politics, form and content that mirror the world back to us from our multiple screens. Media of communication, sociality, and information are today and will invariably become more central in all our lives. Students have a right to be equipped with evolving meta-analytic skills with which to consider what they are taught and how they are being positioned and taught by media's public pedagogies, how their consumer-learner identity is crafted, what their consumer and information choices are, how pathways to and the form and content of knowledge are shaped by commercial interests, how *they* are reshaping literacy into new lexico-semiotic grammars, and how connectivity is transforming all our identities into a much more cosmopolitan experience of global citizenship. In that regard, I would argue that we cannot look at literacy, pedagogy, or curriculum independent of issues around the politics of globalization, the rapid metamorphoses of new media and the staying power and hybridization of old media. What this requires is a critical social and cultural literacy – a cultural analysis of the politics of new times.

The conceptual elements of the teacher education course I have described here are but one approach that attempts to teach critical analytic 'reading' and 'writing' skills across a range of media and information sources, and to provide a new generation of teachers with the conceptual and practical learning experiences of a multiliteracies pedagogy. The study of technoscapes and mediascapes is important not only because of their profound influence, global reach, and pervasiveness, but because of their 'naturalness': the ways in which new ICTs and the skills they demand and which we develop, adapt and use, have rapidly become a 'natural' part of our everyday lives. If we accept, in qualified broad terms, the arguments about globalization put forth by, for instance, Appadurai (1990; 1996), Castells (1989; 1996; 1997), or Harvey (1989; 1995), then the kind of multimedia, multiliteracy education that I have advocated here – one that goes beyond functional IT skills and situates literacy, new technologies, social subjects, representation and communication in historical, social, cultural, global and local context -- should be part of the common stock of every person's knowledge. It is an imperative and fundamental part of a responsible education for a new kind of 'glocal' citizenship in an age where

communication and our daily 'reading' of and interaction with the world around us is increasingly digitized, visual, symbolic and, always, political.

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