Critical Cyber Pedagogy: Doing Multiliteracies in the Singapore Classrooms

AARON KOH
School of Education, The University of Queensland

The Ministry of Education in Singapore has embarked on the ambitious project of introducing IT in schools. The IT Masterplan, budgeted at a cost of $2 billion, aims to wire up all schools by the year 2002. While the well-funded IT Masterplan is seeing the project in its final phase of implementation, this paper argues for a "critical cyber pedagogy" along with the acquisition of the functional and operational skills of technology. Drawing on theories of critical multiliteracies (Burbules & Callister, 2000; Luke, 2000b; New London Group, 1996), this paper explores and suggests how an instructional design of two classroom activities can be utilized as new forms of cyber and technoliteracies. Through the critical evaluation of websites and hypertext construction, students will be equipped with a new literacy that extends reading and writing by incorporating new blended forms of hybrid textualities. This technology-assisted pedagogy can achieve the desired outcome of self-directed learning, teamwork, critical thinking and problem solving strategies necessary for a knowledge-based society.

Introduction

Singapore education has taken another big leap in curriculum reform with the implementation of information technology (IT) in schools. The IT Masterplan initiated in early 1997 is now seeing its final stages of wiring up all schools in Singapore. Costing the Ministry of Education a total of $2 billion, this is by far one of the most expensive projects that involves all schools in Singapore. The primary objective of the IT Masterplan is to equip students with the knowledge and skills of IT so as to prepare students

(as human capital) for a competitive global economy. In a Bourdieuian sense, knowledge and competence in IT is translated as ownership of individual cultural capital in the exchange value (Bourdieu, 1986). This can pave the way for one's success but more importantly, for Singapore as a nation to continue to sustain its competitiveness in the global economy.

Given that IT constitutes an important aspect of the overall economic planning in Singapore, and that the IT Masterplan has already made its headway in schools, there is now a need to focus on developing effective pedagogies to complement the use of new information technologies in classrooms. By effective pedagogy I mean a critical oriented dimension to the use of technology and not the mere mastery of the operational skills of technology (Lankshear, Snyder & Green, 2000; Luke, 2000a). This is one crucial direction that the IT Masterplan has overlooked. The focus of the IT Masterplan can summarily be said to be heading towards two directions: one, the acquisition of hardware and software for schools and secondly, developing IT competencies for teachers and students. A recent article, "Proposed IT Competencies for Singapore Teachers" by Williams and Wong (1999), exemplifies the kind of research on IT that is currently taking place. It also sheds light on the narrow emphasis on developing the operational and functional use of IT at the expense of a more critical orientation. While a critique of the paper for its limited perspective on the use of IT is not within the scope of this paper, I would like to point out that researchers, teachers and curriculum specialists should capitalize on the provision of hardware and software and develop cyber pedagogies that reconceptualize teaching and learning with a critical framework. We must bear in mind that it is not technology *per se* that brings about change, but the use of technologies must be accompanied by a change in educational practices (Burbules & Callister, 2000).

In this context, this paper will first provide a conceptual definition of "critical cyber pedagogy" which I draw from the seminal works on critical pedagogy developed by Paulo Freire (1972, 1973) and Henry Giroux (1988). The multiliteracies framework developed by The New London Group (1996) also provides a trenchant theoretical discussion on the educational issues related to cyber-literacy pedagogy in view of the growing variety of text forms associated with information and multimedia technologies. Next, my paper will shift from theoretical discussions to practical strategies for new kinds of IT literacies that will be requisite in emergent IT environments of a knowledge-based society. In the paper, I

will suggest how an instructional design of two classroom activities, namely, the critical evaluation of websites and hypertext construction, can be utilized as new forms of cyber and technoliteracies. The instructional design of these two classroom activities are adapted from one preservice teacher education course that I have taught in an Australia university. The pedagogical outcome of these two theory-grounded practical strategies have already been in a sense "tried and tested." The research found that through the critical evaluation of websites and hypertext construction, students are not only exposed to a new literacy that extends reading and writing by incorporating new, blended forms of hybrid textualities, they are also forming new spatialities, multiliteracies, and identities of communication and learning (Kapitzke, 2000a). Hence, this technology-assisted online pedagogy can achieve the desired outcome of self-directed learning, teamwork, critical thinking and problem-solving strategies necessary for productive and skilled citizens in a knowledge-based society.

Some Educational Issues on Cyber Pedagogy

The raison d'être of critical cyber pedagogy is the transformation of classroom pedagogy that directs at student-to-student learning. That is to say, students are actively engaged in the construction and production of knowledge while the teacher's role is to design and structure the learning environment (Kapitzke, 2000a). In such classroom pedagogy, in particular online pedagogies, the teacher is no longer the authority to transmit knowledge, and the student as empty vessels to be filled (akin to Freire's notion of "the "banking" concept of education" (1972, p. 58).) It is through a process of investigative learning that students develop what Freire (1972) calls a "critical consciousness" (p. 20). As I will elucidate in the latter part of the paper, the instructional design of the two online activities aims to bring about such a learning benefit.

The agenda of critical cyber pedagogy also works against the notion that all texts are neutral and given, but are situated within larger discourses that construct a version of the world. The key to the "criticality" of cyber pedagogy is to deconstruct this world and begin to question and critique its representation for its inherent biases and the ideological interests that it serves. In this way, students are empowered and not manipulated by texts that work to position them. They are instead in a position to validate and investigate the production of differential readings through an active construction and production of knowledge (Giroux, 1987). The focus of

critical cyber pedagogy therefore entails a "transformative pedagogy around technology through the *shift* from knowledge transmission through instruction *to* knowledge production through construction" (Kapitzke, 2000a, p. 227). The outcome of which can lead to self and societal transformation. This is, in essence, the tradition of critical pedagogy that Friere and Giroux espouse and promulgate.

While I argue that teachers focus on the critical aspect of online pedagogies, they must also be informed of new literacy practices, now that new information technologies are creating new forms of digitalized texts and other variants that are yet to be invented. To this end, the challenge for teachers is to design effective pedagogies to deal with new forms of texts and by implication their attendant literacy practices.

I. Multi-semiotic Textual Practice

Teachers can no longer treat new forms of texts within the same spaces of educational enclosure. With the use of new information and communication technologies in the classroom, one of the educational implications for teachers is the need to re-shape approaches to teach new digitalized texts and to re-invent new literacy practices so as to avoid educational trappings of traditional classroom practices. Chalk and talk pedagogies may become obsolete and dysfunctional in emergent digital environment in the near future. An understanding that new information and communication technologies have created new forms of texts calls for new reading and writing practices. The traditional print-based texts that teachers use as teaching resources in the classroom must now include other digitalized texts such as educational software that come in CD-ROMs and hypertexts. In terms of design and mode, these texts are composed of "hybrid textualities" (Luke, 2000b, p. 83) and are multimodal. That is to say, unlike traditional print-texts which are logocentric, digitalized texts are composed of blended textual forms of linguistic codes, audio and visual semiotics with sophisticated designs of pictures and moving images. The interactive nature and composition of digitalized texts therefore demand new literacy practices.

Take for instance the reading practices associated with hypertexts. It calls for a whole complex range of new textual reading practices that are necessarily multiliteracy: the written text, graphics and sound all add to the semiotic richness of the text. The multimodality of hypertext does not merely reflect a matter of taste or aesthetic design; it is a coded practice

that represents the world/knowledge on screen. This presupposes the cyberspace navigator to have a range of knowledge pertaining to the symbolic, textual and semiotic codes that are used in the production/ making and in consumption/reading of hypertext (Luke, 2000b). In addition, the reading practice of hypertexts is further complicated by the rhizomatic structure of the texts which does not follow the conventional linear progression of reading as it is done with traditional print-based texts (Snyder, 1996). The cyberspace navigator is involved in a choice of selections to hyperlinks which branch out in many directions to other links/ sites, giving rise to new configurations of textual meanings. The nodal links are also not arbitrarily connected. They create significations themselves (Burbules, 1997). Given the plurality and multi-layed richness of hypertexts, it will no longer suffice to regard computer literacy as mere functional and operational skills, as Kellner (1998) argues:

> Genuine computer literacy involves not just technical knowledge and skills, but refined reading, writing, and communicating abilities that involve heightened capacities for critically analysing, interpreting, and processing print, image, sound, and multimedia material. Computer literacy involves intensified abilities to read, to scan texts and information, to put together in meaningful patterns mosaics of information, to construct meanings and significance, to contextualize and evaluate, and to discuss and articulate one's own views (p. 116).

The "multiliteracies" framework as proposed by The New London Group (1996) is primarily concerned with developing such a pedagogy — a pedagogy that integrates the written with the visual, and with other modes of symbolic representations.

However, such a critical slant to the use of technology is far from reality in the schools in Singapore just as it is reported elsewhere in the classroom settings in North America and Australia (Peters & Lankshear, 1996). My conjecture is that there is a tendency to domesticate IT as tools; its use is either to support the classroom status quo or it is confined only to the margins of education (i.e. as enrichment or classes for the gifted). Therefore, one other aspect of the pedagogic implication for educators insofar as the use of IT is concerned is to avoid the trappings of confining pedagogy to merely operational and functional skills. This perspective on IT is synonymous to the instrumentalist view of IT that concerns itself with *what* IT can do at the expense of asking *how* IT can be used. To develop cyber-pedagogy, educators need to take a more informed perspective on IT that begins to explore the potential of IT as "instruments of normalisation,

marginalisation or empowerment" (Kapitzke, 2000b, p. 59). This non-neutral perspective on IT corrects the view that IT does things for people, without IT doing things to them. In other words, technologies *per se* are not inscribed with power, but power largely rests on who is using them, how they are being used, and to what end they are being used (Kapitzke, 2000b). In short, it is not what IT is used for but how it is used that educators should be concerned with.

II. Critical Multiliteracies

A pedagogy that is concerned with *how to* rather than *what* IT can do begins to interrogate issues of representation (i.e. How bodies of knowledge or institutions are represented on screen?), reader position (i.e. How is the reader positioned by the text?) and social justice (i.e. How is the reader advantaged or disadvantaged?). By asking how instead of what, the IT/cyberspace navigator begins to challenge the many taken-for-granted meanings and "truths" about a way of thinking, reading and writing the world on screen. A critical perspective on IT in effect recognizes that all texts are mediated and that they are about representations. This critical perspective on IT however needs to be taught. Just like learning the operational functions of computer, students have to be taught explicitly how to think and use IT as a critical tool. The ability to use IT as a critical tool is a metaknowledge demanding metacongnitive skills — the very skills considered "core" in critical thinking pedagogy.

The critical literacy framework developed by Luke (1996) can be applied to train students to be technology critics and not just front end users. Peters and Lankshear (1996), Kellner (1998), Luke (2000a, 2000b), Burbules and Callister (2000) have all extended this critical framework to reading critically in cyberspace. This framework is particularly useful when dealing with a corpus of written texts on the screen. With such a framework, one can ask whose interests are being served by a particular piece of information? This question provokes the reader to think about the ideology and the power relations within social relations and institutions that are embedded and mediated in a seemingly neutral text. While the information presented on the screen can be credible, its credibility however can also be biased as the information presented can be ideologically constructed to serve a certain interest or a certain group (Burbules & Callister, 2000). The cyber navigator can further question the gaps and silences on the World Wide Web. No matter how the information on the

Internet is treated as "World Wide," its formation is far from complete; information will often be omitted and for most of the time this is done intentionally for ideological reasons. In this way, the information contained on a web page privileges certain voices and perspectives (Burbules, 1997). There is also a need for critical users of the Internet to re-create a context of reading with the information gathered from the Internet. Instead of treating the bits of information on the Internet in isolation, by re-creating the context of information, the cyber navigator can construct a narrative about the information in greater depth and complexity. This will enable critical users of the Internet to question the apparent neutrality and decontextualized meaning systems and the socio-cultural context in which the text is situated.

The multi-semiotic composition of digital texts further requires the cyber navigator to engage in an analysis of the symbolic modes of representations on the screen. There is a meaningful system in place with the textual composition of hypertext. The use of colors, graphics, sound and moving images are textual elements that combine with the written text to produce a semiosis. A theory of language will not be able to explain these other semiotic modes. Therefore, the cyber navigator needs to develop a "metalangauge" to describe and analyse these semiotic elements beyond seeing them as "decorative" or as aesthetic designs. The cyber reader can begin by asking why the Web juxtaposes images, music and text? Do these textual elements carry independent meanings or do they reinforce each other to construct meanings? Why is a particular combination of semiotic codes used in relation to others? Is there a reading path set up with the use of graphics, images or video? How does this position the reader? Is there a narrative/symbolic meaning to the nodal links? All these questions will develop a critical practice that questions the non-neutrality of texts. That the choice of visual and textual composition of digital text is not an innocent practice calls for a new textual practice that necessarily demands multiliteracy and critical skills.

III. Critical Reading on the Internet

The Click Culture is touted to be a potential educational space for teaching and learning. The traditional role of the teacher as the dispenser of knowledge has changed with the vast information that students can access from the World Wide Web. Students are granted greater learning autonomy as they engage in an exploratory and discovery process of

constructing knowledge. They learn to be independent and active learners. Such an approach to learning is known as constructivism. In addition to the constructivist approach to learning, the use of IT in classrooms also encourages group learning or collaborative learning. In collaborative learning, students learn to share their ideas, trouble-shoot problems that arise, and also make decisions and take risks together. In the process of working together as a team, they pick up skills such as negotiation, teamwork and communication skills. These are the very skills deemed as valuable and indispensible in today's work place.

While the advantages of cyber pedagogy abound, there are also inherent "dangers" that confront cyber navigators. The easy access to the many unsavory websites is a constant consternation for parents and educators. Burbules and Callister (2000, p. 96) identify four "troublesome content" areas that manifest in cyberspace. The first is "misinformation." This occurs as misleading, false and out-of-date information put up on the Web. As there is no control over what can be put on the Internet, misinformation, if not carefully evaluated, can be potentially harmful and circulated widely in the form of hoax, rumors, gossips and detrimental conspiracy theories. The second type of information is "malinformation." The source of such information includes pornographic websites, sites that contain harmful materials such as bomb-making instructions, bigoted political and religious views, and so on. There is a moral panic over the easy availability and accessibility of such information since the arrival of the Internet as kids of the Internet culture are very savvy when it comes to accessing such information, even with censorship barriers. The third type of information that has no educational value is "messed-up information." In terms of information and functional design, websites that are poorly organized and presented fall into this category. Instead of presenting useful and valuable information, messed-up information can prove to be a source of frustration and confusion. Finally, the last type of information is "useless information." This occurs as isolated and de-contextualized information that appears to have no educational use at all. However, the seeming triviality of useless information may make sense for another user in another context. This indicates that the information obtained from the Internet does not guarantee absolute reliability and credibility.

I have dwelt at great length to explain the different types of information that one can obtain on the Internet to elucidate two very important points that educators should be aware of. The first is that

censorship is not the solution to stop students from stumbling on unsavory websites, whether by choice or accident. On the contrary, over-regulation on the access to such websites can encourage an even greater curiosity; students will be even more tempted to taste the forbidden fruit. Censorship of various means will only deny students the opportunity to learn to discern, discriminate and evaluate their choices (Burbules & Callister, 2000). Hence, it is necessary and important for educators to teach students critical skills rather than solely navigational skills so that students know how to discriminate "misinformation (what to believe); malinformation (what is worthwhile); messed-up information (what makes sense); and mostly useless information (what is relevant)" (Burbules & Callister, 2000, p. 102). The following activity is designed to develop students' critical evaluative skills.

From Theory to Practice

Activity 1: Critical Evaluation of Websites

With project work now incorporated as an important assessment component in the Singapore school system, students are relying more on the Internet as their "library" and source of information. In the process of amassing information, it is very likely that students stumble on mal-, mis-, and/or messed-up as well as useless information which I have discussed in the preceding paragraphs. The rationale for the activity on evaluating of websites is to develop in students a critical awareness of the validity, accuracy and authenticity of the information that students gather in their process of doing research. This activity is a broad framework that can be used across all levels and curriculum areas. As a starting point, the teacher can take students through some useful sites that provide general evaluation criteria. Some of these useful websites are:

http://www2.widener.edu/Wolfgram-Memorial-Library/webevaluation/webeval.htm
http://lib.nmsu.edu/instruction/eval.html
http://www.albany.edu/library/internet/evaluate.html
http://www.library.uq.edu.au/internet/inteval.html

Having browsed through some of these websites, the teacher can instruct students to compile a checklist for the evaluation of websites.

Using the above Internet resources which are taken from university library websites (see reference list for citation details), I have developed a general framework for evaluating websites.

ANALYTIC CATEGORIES	WHAT TO FOCUS ON
Purpose	Who is the intended audience?
	Does it support an official group?
	Is the page trying to sell something?
	Is it for entertainment?
	Is the information what you are looking for?
Source	Who is the author?
	What are the author's credentials?
	Is the author also credited to an established institution?
	Can the author be reached via email or other contacts?
	Does an educational institution/commercial site/ government department host the site?
Content:	
1. Accuracy	Look for point of view.
	Are the claims made in the information well supported?
	Is the information bias or misrepresented?
2. Comprehensiveness	Is there breath and depth in the information given?
	Is the information well organized and clearly presented?
	Is there clarity in the style of writing?
	Is there consistency in the argument?
3. Currency	When was the information produced and last updated?
4. Links	Are the links relevant and appropriate?
	Is there a narrative to the links?
	Are the links meaningful?
	Are the links reliable?
	Are there blind links?
Language	Is the language used appropriate to the genre?
	Is the language used inflammatory, sensational or emotional?
Semiotics	Are the images salient?
	Do they set up a reading path?
	Are the images symbolic?
	Do the use of graphics, sound and semiotics serve a function?
	Do the icons clearly represent what is presented?
	Do the semiotics have meanings independent of their own?

After explaining the criteria, the teacher can take students through examples of bogus websites without telling them much about the authencity of the websites. The examples will provide students with an understanding of the need to critically evaluate the information they find on the Internet. The following URL provides web evaluation materials and examples:

http://www2.widener.edu/Wolfgram-Memorial-Library/
webevaluation/webeval.htm

As a follow-up activity, students can be grouped in pairs to evaluate other commercial websites using the proposed criteria.

Activity 2: Hypertext Construction

In order to understand the complex composition of hypertexts and the dynamics of meanings embedded in the multi-semiotic composition of hypertexts, a hands-on experience in constructing a webpage of their own will help students develop three levels of skills. The first has to do with the mechanics of Web design/authoring skill and the second, critical multiliteracies skills that this paper has discussed in the preceding section. Lastly, hypertext construction provides students the opportunity to engage in collaborative learning. Students learn to work as a team, negotiate their contributions and take risk collectively.

Where critical skills are concerned, when students have had the hands-on experience in constructing a webpage of their own or in groups, they will be more critically aware that what goes into the selection of materials for a webpage is not arbitrarily determined. The choices made in terms of information and functional design, the use of images, visuals, links, colors, sound, video and moving images work on the principle of inclusion and exclusion. That is to say, one can choose to include or exclude certain information on the Web for ideological reasons. After students have had the opportunity to construct a webpage of their own, not only will they become aware of how a webpage can be constructed, but also more importantly, they will know how it could have been constructed otherwise. This first-hand experience of hypertext construction will illuminate the apparent "naturalness" or invisibility of designer/author choices. It gives the cyber navigator an insider's knowledge to question, criticize, and imagine alternatives (Burbules, 1997).

In traditional classroom practice, students hand in their project work in bound copies. This classroom activity on hypertext construction can replace the traditional way of doing project work. The activity of critically evaluating websites will also complement the use of hypertext construction for project work. Once students have decided on a research topic for their project work, the teacher can further define the scope of the topic for them. Students will then brainstorm for ideas and allocate tasks. The tasks range from collecting information on the Internet, designing the webpage, searching for interesting wallpapers and images, scanning them to the eventual writing of the project. Students must be taught explicitly how to write and publish on the Internet as there is a tendency for students to pilfer ideas from different sources and do a cut-and-paste collage and submit it as their own work. Issues on copyright and plagiarism need to be addressed, especially when project work is an important assessment component in the Singapore classrooms. Once the project work is completed, students can save their document as html files in a floppy disk or publish their work on free Internet sites such as Geocities, which are easily available on the Internet. Apart from the advantage of saving printing cost for their project work, students can also obtain feedback from cyber navigators all over the world on their project work, other than the teacher's feedback.

In sum, from a pedagogical point of view, using hypertext construction to do projects provides students the opportunity to acquire hypermedia and technological skills, while they also learn to apply critical multiliteracies skills. An even more important pedagogical principle that underpins using hypertext to do project work is that students learn to construct knowledge rather than treat knowledge as information. This, in essence, is what The New London Group (1996) means when they refer to "knowledge as design."

Conclusion

There is no denying that IT with its attendant celebratory rhetoric has infiltrated schools. Teachers are nervously confronted with a supposedly "new tool" which is touted to bring about more innovative and effective classroom pedagogies. While IT is enthusiastically promoted in schools, there is a need for researchers, teachers and teacher-education programmes to take a cautionary stance and not jump onto the bandwagon of the IT hype. I have argued in the paper that a focus on the operational use of IT is limiting in terms of classroom pedagogy and that a utilitarian approach

to IT will not bring about educational reform in the true sense. What needs to change along with the use of IT is educational practice. A critical multiliteracies approach to the use of IT will provide students with the critical analytical tools to address the sociocultural and political consequence of technological change (Luke, 2000b). In the age of Information Technology, students must have a mastery of both technical and critical skills which will be requisite in emergent IT environments of the knowledge-based economy. Cyber-pedagogy must begin to head in the direction of a critical multiliteracies framework so that information technology as cultural capital will benefit Singapore students and the nation as a whole.

Acknowledgments

References

Alexander, J., & Tate, M. *Evaluating web resources*. Wolfgram Memorial Library, Widener University. Last updated on 21 July 2000. Accessed on 17 December 2000 from http://www2.widener.edu/Wolfgram-Memorial-Library/webevaluation/webeval.htm

Beck, S. *The good, the bad & the ugly: Or, why it's a good idea to evaluate web sources*. New Mexico State University Library. Last updated on 16 November 2000. Accessed on 17 December 2000 from http://lib.nmsu.edu/instruction/eval.html

Bourdieu, P. (1986). Forms of capital. In J. G. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). New York: Greenwood Press.

Burbules, N. (1997). Rhetorics of the Web: Hyperreading and critical literacy. In I. Snyder (Ed.), *Page to screen: Taking literacy into the electronic era* (pp. 102–122). St. Leonards, NSW: Allen & Unwin.

Burbules, N., & Callister, T. (2000) *Watch IT: The risks and promises of information technologies for education*. Boulder: Westview Press.

Freire, P. (1972). *Pedagogy of the oppressed*. New York: Herder & Herder.

Freire, P. (1973). *Education for critical conscious*. New York: Seabury.

Giroux, H. (1987). Introduction: Literacy and the pedagogy of political empowerment. In P. Freire & D. Macedo, *Literacy: Reading the word and the world* (pp. 1–30). South Hadley, MA: Bergin & Garvey.

Giroux, H. (1988). *Teachers as intellectuals: Toward a critical pedagogy of learning*. New York: Bergin & Garvey.

Jacobson, T., & Cohen, L. *Evaluating internet resources*. University at Albany Libraries. Last updated on April 1996. Accessed on 17 December 2000 from http://www.albany.edu/library/internet/evaluate.html

Kapitzke, C. (2000a) Cyber pedagogy as critical social practice in teacher education program. *Teaching Education, 11*(2), 211–229.

Kapitzke, C. (2000b). Information Technology as cultural capital: Shifting the boundaries of power. *Education and Information Technologies, 5*(1), 49–62.

Kellner, D. (1998) Multiple literacies and critical pedagogy in a multicultural society. *Educational Theory, 48*(1), 103–122.

Lankshear, C., Snyder, I., & Green, B. (Eds.). (2000). *Teachers and technoliteracy: Managing literacy, technology and learning in schools*. St. Leonards, NSW: Allen & Unwin.

Luke, A. (1996). Text and discourse in education: An introduction to critical discourse analysis. In M. W. Apple (Ed.), *Review of research in education* (pp. 3–48). Washington, DC: Amercian Educational Research Association.

Luke, C. (2000a). New literacies in teacher education. *Journal of Adolescent & Adult Literacy, 43*(5), 424–435.

Luke, C. (2000b). Cyber-schooling and technological change: Multiliteracies for new times. In B. Cope & M. Kalantzis (Eds.), *Multiliteracies: Literacy learning and the design of social futures* (pp. 69–91). South Melbourne, Australia: Macmillan.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review, 66*(1), 60–92.

Peters, M., & Lankshear, C. (1996). Critical literacy and digital texts. *Educational Theory, 46*(1), 51–70.

Snyder, I. (1996). *Hypertext: The electronic labyrinth*. Carlton South, Vic.: Melbourne University Press.

The University of Queensland Library. *Internet resource evaluation*. Last updated on 20 October 2000. Accessed on 17 December 2000 from http://www.library.uq.edu.au/internet/inteval.html

Williams, M., & Wong, P. (1999). Proposed IT competencies for Singapore teachers. *Education Journal, 27*(2), 125–144.