DIGITAL CRITICAL LITERACY FOR GENERATION 1.5 AND EVERYONE ELSE

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Abstract

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The whole "information economy" relies on literacy, and increasingly, on the expansion of these skills to a level of critical literacy on paper as well as on screens. My definition of this needed critical literacy as the ability to produce and perceive meaning in these venues and use that meaning to analyze, synthesize and evaluate information shows its reliance on a common core of abilities and features. The underlying cognitive abilities and four levels of literacy are not any different for Generation 1.5 learners than for other individuals, whether they are developing critical literacy in their native language or a second language. And while there may be some additional features (like sounds and images) in a digital environment, the essential cognitive skills and levels of language are also constant. Despite these shared features, there are currently far too many illiterate people on the planet, and the problem of illiteracy in both print and digital contexts appears in developed and developing countries, in American college classrooms and in the Third World. However, if critical literacy is appropriately defined, then language users who achieve it are at the summit of human language ability, regardless of whether the venue is print or electronic.

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Introduction

One would think illiteracy would be a straightforward topic to research and study. Conventional definitions make illiteracy seem simple: lack of ability to read and write, or more generally, lack of education (Blake & Blake, 2002, p. 10-11). But if statistics and a fuller explanation are needed to support these definitions, the situation becomes much more difficult. Surely, for example, there are degrees of literacy: it's not just being able to recognize the letters on a page or screen, or create them, so the definition needs much further explication and support.

What is needed is a full, rigorous, vigorous definition of contemporary critical literacy that captures its essence in terms of the cognitive and linguistic skills it entails. A proper definition demonstrates that literacy is the summit of human linguistic achievement for everyone, reaching beyond the development of spoken language. A carefully wrought definition also shows that literacy draws on a core set of processes whether it is practiced on printed pages or electronic screens, and whether it is practiced by learners of L1, L2 or those described as Generation 1.5.

Definitions of Critical Literacy

The word "literacy" is so often used with modifiers of various kinds. So, a person can be musically literate or illiterate, computer literate, or math literate—and actually for this last phrase there is a new term, numeracy, (Paulos, 1990) meant to parallel literacy but to describe basic mathematical abilities. Literacy seems to be used generically to refer to skilled capacity in some specific area, i.e., education in that area. A number of modifiers are used, including emergent literacy (Teale & Sulzby, 1986), extended literacy (Blake & Blake, 2002), functional literacy (Blake & Blake, 2002, p. 11-12), multicultural literacy (Street, 1993), cultural literacy (Hirsch, 1987) and, perhaps to capture them all, multiple literacies (Huot et al., 2004).

In any case, with modifiers or without, defining and pinning down the exact nature of literacy and illiteracy is a real problem. Moreover, all the extant definitions seem to fall short on four dimensions: first, the definitions do not generally make clear the importance of critical thinking in defining true literacy. Second, no definition I have been able to find addresses the precise nature of literacy in contemporary society given the role of the World Wide Web in our lives. Virtually none of the definitions that appear in published books, in journal articles online or on paper, or on websites address these matters. Furthermore, definitions given for literacy and illiteracy also do not deal with the meanings of these terms in particular for second language learners, though there is some discussion of literacy development for learners of English as a second language. Finally, there is virtually no discussion of literacy development among those in the U.S. group described by the term Generation 1.5, though the scholar who defined the group, Linda Harklau, (2003) notes that one of their distinguishing characteristics is their frequent lack of literacy in either L1 or L2, to be discussed below.

Here's one definition of critical literacy, derived from my earlier work on readable writing:

> Critical literacy is best defined as the psycholinguistic processes of getting meaning from print and putting meaning into print, used for the purposes of analysis, synthesis and evaluation; these processes develop through formal schooling and beyond it, at home and at work, in childhood and across the lifespan and are essential to human functioning in a democratic society.
> (Horning, 1999, p. 21)

As I noted at the outset, this definition sets up critical literacy as not a single static entity but rather as a series of processes people use to send or receive meanings and to analyze, synthesize and evaluate information. The claim I want to make now, however, changes this definition slightly: first, critical literacy represents the highest level of human linguistic ability, and second that critical literacy is the same phenomenon whether people, regardless of language background, engage in it through print on paper or pixels on a screen, with or without pictures, graphics, sound and movement.

The changes in the definition of critical literacy to accommodate electronic venues are relatively minor. If "on the screen" or "in electronic form" is added everywhere that the word "print" occurs, and a few other minor adjustments are made, the resulting definition looks only slightly different from the one stated above:

> Critical literacy is best defined as the psycholinguistic processes of getting meaning from or putting meaning into print and/or sound, images, and movement, on a page or screen, used for the purposes of analysis, synthesis and evaluation;

these processes develop through formal schooling and beyond it, at home and at work, in childhood and across the lifespan and are essential to human functioning in a democratic society.

The capacity of web pages to use not only written language but also images, graphics, color and the juxtaposition of elements to make meaning does not significantly alter the underlying processes that constitute critical literacy. If Frank Smith is right that we process text (including print and now, images) in whole meaningful units rather than as individual elements (2004), the fundamental processes are unaltered in electronic form.

The definition is meant to capture a variety of aspects of what is sometimes called "information literacy." Usually, this phrase is used to describe computer users' abilities to navigate the Web, such as the use of search engines to find information. In addition, it refers to users' abilities with email and other forms of Web-based communication and their understanding of the structure of the Web itself. In the definition proposed here, these kinds of abilities are integral to the capacity to analyze, synthesize and evaluate information in print or on the screen. Just as the ability to use an index in a book is assumed in the ability to locate specific information there, the ability to use search engines or to follow hyperlinks on a website is assumed for Web-based information.

Finally, this definition is intended to suggest that critical literacy is broader than academic literacy, the ability to use these kinds of skills in classroom situations; critical literacy is essential to every facet of contemporary life, within the classroom and more importantly beyond it. Critical literacy occurs naturally in a variety of contexts, and the particular context, whether it is academic or community-based has an impact on how people learn and develop the abilities involved, as argued by Adler-Kassner and Harrington (2002, p. 99-101). Thus, the broad definition of critical literacy proposed here is meant to address a wide array of contexts, academic and otherwise.

Defining Illiteracy

If this definition fairly captures the nature of critical literacy, then defining illiteracy becomes a more straightforward task. Illiteracy is simply the inability to use the various psycholinguistic processes to produce or perceive meaning and make judgments based on that meaning in print or digital form. Just as the survey of adult literacy found a relatively high level of illiteracy in the population at large in terms of ability to process complex printed texts and make judgments (Kirsch, et al., 1993), so too would a similar survey based on this new definition find widespread illiteracy in both print and electronic formats.

A number of other definitions of illiteracy have been offered. It is very difficult to get a clear definition of illiteracy, even though dozens of books on literacy have been published. Some define literacy and some don't; definitions of illiteracy are nearly nonexistent. To address this problem, Blake and Blake (2002, p. 8-11) review the history of the word literacy from Greek times to the present. They come to the conclusion that literacy should be simply defined as the ability to read and write. Discussing the pejorative connotations of "illiteracy," Blake and Blake note that other terms like "nonliterate" or "preliterate" (2002, p. 8) drawn from classical studies may be more neutral but do not change the essential character of illiteracy, an inability to read and write.

They expand their definitions to include the phrase "functional literacy" by which they mean "an acceptable grasp of the skills of reading and writing for functioning in the society as a young adult" (Blake & Blake, 2002, p. 13). Functional literacy has been widely described and is often what is measured in surveys of literacy such as the survey of <u>Adult Literacy in America</u> (Kirsch, et al., 1993) and the international literacy survey (<u>Literacy in the information age</u>, 2000). These surveys entail measurement of the performance of a sample population on a variety of literacy and numeracy tasks. One result of these surveys and other measures of literacy is a clear description of those who are functionally illiterate:

> They are able to read a recipe, follow a map, and work the keys of a McDonald's cash register. On the other hand, they have trouble filling out a job application, typing data into a computer, using standard punctuation in a paragraph, getting their checkbooks to balance, or taking a written test for a driver's license. (Blake & Blake, 2002, p. 2)

Thus, those who are functionally illiterate cannot, as I have suggested, perceive or produce meaning in written form whether on paper or on a screen.

Some more broadly based definitions come from literacy.org (http://www.literacy.org/), a website on the Internet, that

> is a gateway to electronic resources and tools for the national and international youth and adult literacy communities. This site is jointly sponsored by the International Literacy Institute (ILI) and the National Center on Adult Literacy (NCAL) at the University of Pennsylvania Graduate School of Education.

According to the website, the International Literacy Institute is a joint project of UNESCO and Penn's Graduate School of Education to work on international literacy issues. The site's other sponsor, the National Center on Adult Literacy (NCAL) was set up by a federal grant and is supported by public and private funds to research learning, support basic education and literacy development and be a resource for literacy information (http://www.literacy.org/about_us.html). This website offers an array of definitions and other information about literacy.

The website points out that defining literacy and illiteracy goes beyond "ability to read and write." However, in terms of international statistics and measurement of literacy, many countries report only schooling data as a basis for their claims of literacy rates in the population at large. So, for example, a country may say 80% of its citizens have completed 5 or more years of school and hence are literate. Such claims are flawed since schooling and literacy are not necessarily connected and since such descriptions say nothing about the role of critical thinking abilities or ability to use the web. The website draws on the United Nations' UNESCO statistics to describe the problems with reporting information about literacy. It shows clearly that getting good information about literacy and illiteracy is a difficult and complex process, partly because of the problems with definitions, but also partly because of some underlying issues of assessment strategy:

> In order to provide worldwide statistical comparisons, UNESCO (the UN agency charged with gathering educational statistics) has relied to date almost entirely on data provided by its member countries. These countries, in turn, typically depend on national census information, which most often determines literacy ability by the proxy variable of self-stated years of primary schooling or through self-assessment questionnaires. Many specialists would agree that such

> measures are likely to be unreliable indicators of literacy ability. Nonetheless, up to the present, systematic national or regional surveys which measure literacy skills have only just begun in few industrialized countries while little progress at all has been forthcoming in developing countries. (literacy.org)

The website notes that the information that is available may not accurately report illiteracy rates among females in many countries, as well as rural populations, minorities and indigenous peoples. Even if the statistics provided were current and accurately reflected some appropriate literacy characteristics that were directly measured or assessed, there would still be the problem of definition.

Here's a brief example of why the issue of definition of literacy is so central to assessing literacy across all learners. I think of myself as a highly literate individual, reading and writing an array of types of documents in print. However, I was essentially illiterate with respect to web sites. I didn't even know the most basic vocabulary, such as the distinction between web *pages* and web *sites*, that sites are compilations of pages. In becoming web literate, I learned these distinctions and other aspects of reading and writing in a digital form. I realized I was illiterate when I started thinking about creating my own web site, so I got help from a technology staff member at the university. He got me started and showed me the basics of using HTML (hypertext markup language, a programming tool) to create a site.

But I really started to move toward web literacy when an instructor in a "how to make a website" class began demonstrating the web authoring software called Fusion, a product of NetObjects.com. He opened the software to a grid-like page that resembled a piece of graph paper. The tools for drawing and creating buttons, choosing colors and so on reminded me a little of Power Point, with its bullet point lists, and a little of using clip art to place an image in a document, and a little of some drawing functions I have used, to create Venn diagrams and other visual images. Choose a color and a type style, set up your buttons to link the various pages of the site together and you've got a website.

Knowing how to create a website has changed my reading of them. That is, I have become web literate, able to produce and perceive meaning on web sites, including text, pictures, sounds, movements and use those meanings to analyze, synthesize and judge material. My abilities, admittedly still somewhat limited, illustrate that web literacy builds on print literacy, but calls on the same array of cognitive and linguistic skills and goes beyond them. It is important to keep in mind, also, that I am a native speaker of English, approaching the web in English. The situation is more complicated, but not fundamentally different for L2 learners.

Expanding Literacy: Generation 1.5 and L2 Learners

There is, thus, a further problem of definition, having to do with the language base for literacy. Suppose, in my web learning scenario just discussed, I described a person who was not just lacking critical literacy in a digital environment but who didn't even know the language. Or who did know the language well enough to understand and speak to the needs of daily life but had little or no written language ability or academic writing ability. This situation describes the position of members of the group now referred to as Generation 1.5 (Harklau, 2003). An examination of this group in terms of critical literacy issues provides another dimension of support for the two claims that

critical literacy is the summit of human linguistic ability and that it entails the same set of skills and features whether the material being processed appears on a page or a screen.

Linda Harklau, a second language researcher at the University of Georgia, describes this population as follows:

> An increasing number of U.S. high school graduates enter college while still in the process of learning English. Referred to as generation 1.5 students because they share characteristics of both first- and second-generation immigrants, they do not fit into any of the traditional categories of nonnative English speakers enrolled in college writing courses, nor have they been the focus of much research on students learning to write in English as a second language. …There is great diversity among them in terms of their prior educational experience, native and English language proficiency, language dominance, and academic literacy.
> …One of the most common traits among generation 1.5 students is limited or no literacy in the first language. (Harklau, 2003)

In terms of critical literacy, these students are one of the most challenging groups because of their complex characteristics and varied learning needs. They make an interesting test case for the development of critical literacy because of their widespread illiteracy in either their native language or their second language (English or any other).

As Harklau (2003) points out, the key point is that these students are distinct from both international ESL students and immigrant ESL students. International second language students are those who come to the U.S. to earn a college degree with the intention of returning to their native countries to live and work. They are usually literate in their L1, though perhaps not critically literate, and have often had extensive instruction in English in their native countries as well as intensive ESL instruction in special programs prior to or concurrent with their U.S. college enrollment. They have had ample instruction and practice in literacy development in both their native language and in English.

By contrast, immigrant second language students are those who may have had public education in their native countries to some level but now live in the U.S. and may be American high school graduates and/or American college students. They expect to spend the rest of their lives in the U.S. They may or may not be literate in any sense of the term in their native language. Generation 1.5 students are different from both of these groups, especially with regard to literacy; they are, according to the definition established by Harklau above, most likely not literate in either L1 or L2. Thus, they might be seen as having special literacy needs, but in fact, careful examination shows that like others, they develop critical literacy skills from the same base of cognitive and linguistic capacities. Critical literacy, I have been arguing, is the summit of human linguistic ability. Their critical literacy is the same on paper as it is on the web, as is true for all people. An exploration critical literacy for Generation 1.5 provides further support for my two major claims.

Generation 1.5 and Common Cognitive Skills

For Generation 1.5 learners, critical literacy entails the same base of fundamental abilities I have constructed. There are, then, the cognitive abilities required that are part of human beings' fundamental capacities, and the four levels of language ability. This

entire array of cognitive and linguistic abilities is the base on which critical literacy rests. To review the definition here, then, critical literacy for Generation 1.5 learners is

> best defined as the psycholinguistic processes of getting meaning from or putting meaning into print and/or sound, images, and movement, on a page or screen, used for the purposes of analysis, synthesis and evaluation; these processes develop through formal schooling and beyond it, at home and at work, in childhood and across the lifespan and are essential to human functioning in a democratic society.

Like others, critically literate Generation 1.5 learners should be able to read and write in ways that allow them to analyze, synthesize and evaluate information they get from print or in digital form.

The development of critical literacy among Generation 1.5 learners begins, then, with the fundamental cognitive abilities described previously, the abilities to identify, categorize, discriminate and to use redundancy. As Pinker's (1997) work suggests, all human beings have these basic cognitive capabilities. Identification means being able to label particular items with their conventional names, a fundamental linguistic task. Anyone who can speak and understand language (i.e. all normal human beings) must be able to do identify sounds and words in order to use the language. To categorize elements is also an essential cognitive ability relevant to language learning and use. There are many variations in sound, for instance, that arise as a by-product of dialect variation, and speakers must be able to categorize those sounds in order to understand spoken forms. There is substantial evidence that human beings come into the world with a specific ability to categorize sounds into phonemes; the data on categorical perception of sound among infants across languages and cultures is well established (Eimas, et al., 1971; Carroll, 2004, p. 75-80).

The ability to discriminate entails saying whether two elements are the same or different from one another. Here again, linguistically, it is necessary to be able to do this in order to sort sounds and words to use the language. Finally, the use of the inherent psycholinguistic redundancy of language helps insure that the message one person sends is the same as the message another person receives. Redundancy, the information overlap that naturally occurs in language, exists in sound patterns, orthographic structure, word form and usage, syntactic structure and in meaning. Successful language users are always capitalizing on redundancy even though they are not often aware of it. These cognitive abilities are the building blocks of human language capacity. Pinker (1997) suggests that all people have them, regardless of what language they speak. And they form the base for the development of critical literacy.

Generation 1.5 and Levels of Literacy

Critical literacy requires people to interact with printed or electronic texts on various levels. I have argued elsewhere that there are four key levels of language on which people may have the linguistic abilities essential to critical literacy. They are rudimentary, basic, intermediate and advanced. For each level, the description of the abilities at that level suggests the specific challenges faced by Generation 1.5. Learners in this group provide a lens through which to view the more generic problem of contemporary critical literacy and illiteracy.

At the rudimentary level, literate individuals can make use of orthography and graphology to put meaning into written form and to perceive meaning. The ability to do so operates in a similar fashion whether on the page or on the screen and there are surely similar basic components of graphics, images and so on. Generation 1.5 learners must know the writing system of the language in which they are trying to become literate; it may or may not be the same as that of their native language. And, as Harklau (2003) points out, Generation 1.5 students may not be literate in their native language anyway, even at this rudimentary level. Teaching the writing system, then, is one early essential step for these students.

Letters and words fall into basic patterns that literate users can recognize, identify, discriminate and notice redundancy in. Literate users of English know such patterns and will quickly say that after 'q' comes 'u' and that words like 'czar' or 'Ngo' are not English. They can sort 'c' from 'o' and 'b' from 'd' from 'p' from 'q' quickly and easily, often at blinding speeds if they are reading meaningful text. They know the differences that make a difference to meaning, such as those between 'E' and 'F' and the differences of a similar order, say between 'A' and 'a' that are not significant to meaning.

Generation 1.5 faces the challenge of learning the orthography and graphology, spelling patterns and writing conventions of whatever language they are learning, English or another. However, having skills at this rudimentary level is essential to critical literacy and is an achievement common to all learners, whether children developing L1, adults developing L2, Generation 1.5 developing a new language, and whether the critical literacy is developing on paper or on the screen. Undoubtedly, there are rudimentary forms for graphics, pictures, movements and sound patterns that might appear on a website as well. Perhaps teaching Generation 1.5 learners to create websites will allow them to see how the basic elements are combined and can be understood, just as learning to create a page did for me.

At the basic level, literate individuals can capitalize on morphological patterns and basic word and symbol meanings to produce and perceive ideas. Morphology deals with the minimal units of meaning in language, commonly identified as words, and also includes root forms, affixes and their patterns. Literate individuals can, again, recognize, identify and discriminate among words in a language and know the array of bound morphemes that convey meanings and rules for how they work. Language learners must learn the word structure of the language in which they wish to become literate and must also master the basic forms of graphic representation, pictures and so on if they are going to use the web. The common patterns and structures are an essential feature of basic language skill.

Learners of Generation 1.5 along with both immigrant and international second language learners will have to master the word structure of the language they are learning, English or any other. If they are already literate in one language, the underlying cognitive abilities and use of redundancy are already in use for reading and writing in L1. If not, they face additional work to master the word structure, along with the basic patterns of graphics, pictures and so on. Again, both text and image have basic forms and patterns available for study. Generation 1.5 learners are not distinct from other L2 learners in the need for these abilities to attain critical literacy, but certainly they may face additional challenges if they have not developed literacy in their L1.

Learning to work with the written form of English may be an appropriate step for these learners, before moving on to the web.

At the intermediate level, critically literate people can perceive and produce sentences and discourses in a variety of genres. Sentence and discourse features are consistent in a language, whether they appear on pages or screens. Genres are also just as clear on websites as they are on paper—the websites of www.CNN.com or www.MSNBC.com as news sites are clearly different from those of www.literacy.org, an information site, or www.amazon.com, a shopping site. Critically literate individuals recognize the sentence patterns of their language as well as the genres. As I have noted previously, these abilities may not be conscious, but they are nonetheless present.

For Generation 1.5 learners, the intermediate level of skill may pose some challenges if they are not already able to read and write in their native language. However, there will undoubtedly be some carry-over awareness of the nature of sentences and discourse genres even from spoken forms if no level of literacy has been achieved. And while the types of genres may differ from those familiar from the native language, the idea of genres should be constant and recognizable, as should the idea of sentences as the basic units of written language. Generation 1.5 learners may face more work to master the written form of a new language, especially if there is a different writing system involved. However, this level of critical literacy development shares the same features as all second language learning, and in terms of the development of critical literacy, is not different from the fundamental skills all learners must have. Once Generation 1.5 learners know the written form, they can be introduced to discourse genres and perhaps also to concepts from contrastive rhetoric (Kaplan, 1966) that can shed light on the differences in genres from culture to culture.

Finally, at the advanced level, those who are literate can identify and make use of the classic rhetorical modes that might be in use. The basic modes of description, definition, exemplification, classification, comparison/contrast, cause/effect, problem/solution and analysis/synthesis are well known and have been part of rhetorical analysis since the time of Aristotle. Argumentation, too, has basic forms including logical stances, ethical appeals, emotional appeals, empirical stances, appeals to authority and counter-arguments, again dating back to Aristotle. Being able to produce and perceive these modes and to create or understand arguments that draw on them are the essentials of critical literacy.

The idea that the rhetorical modes and strategies for argument vary across different cultures is an observation made in the classic "doodles" article published years ago by Robert Kaplan (1966) and pertinent to the situation of Generation 1.5 learners. The article is usually referred to as the "doodles" article because Kaplan used small sketches to illustrate the differences in modes of thought and patterns in written forms in different cultures. Users of Arabic, for example, will tend to go around their point, as illustrated by concentric circles in Kaplan's doodles, rather than arguing it directly and explicitly as westerners might. Other kinds of differences at the discourse level and in terms of academic discourse community have been explored by Ilona Leki, a specialist in second language writing at the University of Tennessee (Leki, 2004, p. 120-27).

Here again, Generation 1.5 learners may have some additional work to do, but ultimately, they, like all those moving toward critical literacy must understand the modes and forms of argument in the target language in order to perceive and produce texts. This

understanding is essential to critical literacy. Critical literacy draws on these four levels of linguistic ability and the underlying cognitive processes I have described. Generation 1.5 learners can and should achieve critical literacy, drawing on the cognitive abilities and linguistic capacities described here, as should all learners, since critical literacy is essential to full participation in contemporary society.

There is a lot to this critical literacy, and as Mike Rose (1989) pointed out, ours is the first society to expect so many people to do so much with literacy skills. The whole "information economy" relies on literacy, and increasingly, on the expansion of these skills to a level of critical literacy, and an expansion of these skills from paper to screen. My definition of critical literacy as the ability to produce and perceive meaning in these venues and use that meaning to analyze, synthesize and evaluate information shows its reliance on a common core of abilities and features. The underlying cognitive abilities and four levels of literacy are not any different for Generation 1.5 learners than they are for other individuals, whether they are developing critical literacy in their native language or a second language, English or otherwise. While there may be some additional features (like sound and juxtaposition of images) in a digital environment, the essential cognitive skills and levels of language are constant. Despite these shared features, there are currently far too many illiterate people on the planet, and the problem of illiteracy in both print and digital contexts appears in developed and developing countries, in American college classrooms and in the Third World.   However, if critical literacy is appropriately defined, then language users, including members of Generation 1.5 who achieve it are at the summit of human language ability, regardless of whether the venue is print or electronic.

References

Adler-Kassner, L. & Harrington, S. Basic writing as a political act: Public conversations about writing and literacies. Cresskill, NJ: Hampton Press.

Blake, B.E. & Blake, R.W. (2002). Literacy and learning: A reference handbook. Santa Barbara, CA: ABC-CLIO.

Carroll, D.W. (2004). The psychology of language. (4th ed.). Belmont, CA: Wadsworth/Thomson Learning.

Eimas, P.D., Siqueland, E.R., Jusczyk, P., & Vigorito, J. (1971). Speech perception in infants. Science, 171 pp. 303-306.

Harklau, L. (2003). Generation 1.5 students and college writing. Retrieved March 11, 2004, from http://www.cal.org/resources/digest/0305harklau.html

Hirsch, E.D. (1987). Cultural literacy: What every American needs to know. Boston: Houghton Mifflin.

Horning, A.S. (1999). Developing critical literacy. In R.A. Sudol & A.S. Horning (Eds.), The literacy connection (pp. 19-42). Cresskill, NJ: Hampton Press.

Huot, B., Stroble, B. & Bazerman, C. (Eds.). (2004). Multiple literacies for the 21st century. Cresskill, NJ: Hampton Press.

Kaplan, R.B. (1966). Cultural thought patterns in intercultural education. Language Learning, 16, pp. 1-20.

Kirsch, I.S., Jungeblut, A., Jenkins, L. & Kolstad, A. (1993). Adult Literacy in America. Washington, D.C.: Government Printing Office.

Leki, I. (2004). Meaning and development of academic literacy in a second language. In Huot, B., Stroble, B. & Bazerman, C. (Eds.), Multiple literacies for the 21st century (pp. 115-28). Cresskill, NJ: Hampton Press.

Literacy in the information age: Final report of the international adult literacy survey. (2000). Paris: Organisation for Economic Co-operation and Development.

literacy.org. (n.d.) Retrieved accessed May 24, 2004, from http://www.literacy.org

Paulos, J.A. (1990). Innumeracy: Mathematical illiteracy and its consequences. New York: Vintage Books.

Pinker, S. (1997). How the mind works. New York: W.W. Norton.

Rose, M. (1989). Lives on the boundary. New York: Viking Penguin.

Smith, F. (2004). Understanding reading (6th ed.). Hillsdale, NJ: Erlbaum.

Street, B.V. (1993). Cross-cultural approaches to literacy. New York: Cambridge University Press.

Teale, W.H. & Sulzby, E. (1986). Emergent literacy: Writing and reading. Norwood, NJ: Ablex.

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