



Review: Shaping New Literacies Research: Extrapolations From a Review of the Handbook of Research on New Literacies

Author(s): Robert J. Tierney

Source: *Reading Research Quarterly*, Vol. 44, No. 3 (July/August/September 2009), pp. 322-339

Published by: [International Reading Association](#)

Stable URL: <http://www.jstor.org/stable/25655458>

Accessed: 23/07/2011 09:28

Your use of the JSTOR archive indicates your acceptance of JSTOR's Terms and Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>. JSTOR's Terms and Conditions of Use provides, in part, that unless you have obtained prior permission, you may not download an entire issue of a journal or multiple copies of articles, and you may use content in the JSTOR archive only for your personal, non-commercial use.

Please contact the publisher regarding any further use of this work. Publisher contact information may be obtained at <http://www.jstor.org/action/showPublisher?publisherCode=ira>.

Each copy of any part of a JSTOR transmission must contain the same copyright notice that appears on the screen or printed page of such transmission.

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



International Reading Association is collaborating with JSTOR to digitize, preserve and extend access to *Reading Research Quarterly*.

<http://www.jstor.org>

Handbook of Research on New Literacies. Julie Coiro, Michele Knobel, Colin Lankshear, and Donald J. Leu (Eds.). 2008. New York: Erlbaum. 1392 pp. Hardcover ISBN 978-0-805-85651-4; US\$235.00. Softcover ISBN 978-0-805-85652-1; US\$95.00.

Shaping New Literacies Research: Extrapolations From a Review of the *Handbook of Research on New Literacies*

Robert J. Tierney

The University of British Columbia, Vancouver, Canada

The *Handbook of Research on New Literacies* was published with some very ambitious goals. In the preface to the volume, the editors suggest that they expect the volume

to capture the emergence of this new area of research, to inform others, and to begin the construction of an important new area of inquiry...to provide the central leadership for this newly emerging field, directing scholars to the major issues, theoretical perspectives, and interdisciplinary research on new literacies. The Handbook helps us to begin the bold new thinking required to reconceptualize literacy research. (pp. xi–xii)

The editors hope that the volume is viewed as

a single location for reviewing wide ranging, interdisciplinary research through multiple lenses, and in multiple areas of inquiry, in order to determine the most important issues, problems, and questions that must be studied as the Internet becomes this generation's defining technology for literacy and learning. (p. xii)

with the epochal shift to online meaning making on a global scale.

The current volume's editors argue that the speed and nature of digital-literacy developments (especially the shifts to the multimodal forms of representation, knowledge explosion, and networking via the Internet) are unprecedented and warrant a handbook that brings together admittedly diffuse research and theoretical

frames exploring and informing what they see as significant developments. The importance of the volume is tied to the view that we are experiencing a shift in the zeitgeist or a confluence of developments around literacy. As the editors state,

The history of literacy research will recall that reading research attracted a broad collection of researchers, from many disciplines, during the final decades of the 20th century. That intensive, interdisciplinary effort prompted a richer and more complex understanding about the nature of reading and it moved literacy research forward in important new directions. A similar phenomenon may be taking place today with new literacies. As literacy and technology converge on the Internet, many scholars from many different disciplines are moving their research into this arena. They find that the constructs emerging in new literacies research inform their own work in productive ways. At the same time, it is increasingly clear that new literacies research impacts societies, education systems, and public policies in powerful ways. As a result, educators, policy makers, employers, and the public at large all recognize that these new literacies of the Internet will be central to the most important literacy and learning issues of our generation. (p. xi)

They, indeed, have much to say about these developments and, , have compiled a set of papers that provides what I would suspect is the most comprehensive set of discussions of many of these issues to date. Befitting the body of research that already exists, the editors selected authors who are making important forays into our

understanding of these new literacies—their nature, influence, and potential.

The editors of the *Handbook of Research on New Literacies* make the argument that the community of scholars studying new literacies is not the single set of established scholars within this volume but rather is a fuller and more open community of scholars interacting with one another—debating and contesting new literacies. Ironically, the volume may perpetuate the opposite. Essentially, the dilemma may be that the *Handbook of Research on New Literacies* may be striving to achieve a form of convergence that is arguably the antithesis of what may be desirable. Indeed, the *Handbook* struggles with moving beyond the reality of a diverse set of research and an array of theoretical frames to a synthesis that may be as much the problem as the solution. Alternatively, what may be the worth of developments to date are the provocations that these separated, multiple perspectives spur. There is a tension between provocation and certainty that overlaps with the degree of definition, explanation, or prescription of design possibilities. These provocations, in a fashion not unlike what Spiro has touted as complex and ill-structured knowledge domains (e.g., Spiro, 2006a, 2006b), Pitt and Britzman (2006) have described as “difficult knowledge,” and Lather (2008) has heralded in her recent book *Getting Lost*, are certainly enriching, pushing and challenging ideas at the same time as they enhance development of flexible and more nuanced understandings as well as support ongoing conversations and critique. As Witte (1992) has suggested,

the influence of alternative intertexts on the constructive processes increases dramatically...as the multiple voices of distinct constructive semioses mix on what might be called the battleground of the ‘trace.’ It is for this reason that...all discourse...is fundamentally dialogic. (pp. 287–288)

For myself, the *Handbook* provoked an internal dialogue that included several questions, oftentimes dialectical in nature, which may have influenced how I proceeded through the volume. These questions included the following:

What’s new about new literacies? Would the volume venture into dealing with developments worldwide or focus primarily on the western world or the U.S.? Is centralizing leadership the answer or a more generative, diversifying approach? Would another handbook contribute to advances that are sustainable and expansive? Would the shelf life of a traditional copyrighted print publication achieve what an open, digital, web-based, more multivocal and multimedia-based site could offer in terms of spurring conversations into the future? Would the authors and editors provide a combined sense of how the various threads might contribute to understanding and support for developing new literacies?

What kind of collective meaning would the volume afford? Have we made the social turn in our models of meaning making? To what extent has multimodality been addressed and integrated in these discussions? Has the volume addressed the issues of agency and access as well as the push and pull of standardization and subordination versus self-determination and diversity? Would the volume make a substantial contribution to the advancement of new literacies in schools?

Whereas I applaud this volume’s important contributions to the field and anticipate its positive influences, I do ponder whose interests are served, what is neglected, and what warrants further consideration or rethinking. Notwithstanding, as a reviewer, I have my predispositions, questions, background, and refashioned ways of reading and rewriting a book.

And, for better or worse, the current review is non-interactive even though it is available online. Reactions and questions by different readers cannot circulate and seed thinking. Indeed, both the generative possibilities of the volume and my review seem constrained by the limitations of an environment that is not set to be dialogical, expandable, linked, or layered. My review of the volume is structured so that it might be easy to navigate. Section by section I highlight certain aspects of each paper at the same time as I make mention of some of my concerns, impressions of possible links to other work, and suggestions for alternative directions. I close with a brief and broader discussion.

Introduction to the Volume

The introductory chapter by Julie Coiro, Michele Knobel, Colin Lankshear, and Donald Leu, titled “Central Issues in New Literacies and New Literacies Research,” frames the volume’s intent, scope, and themes. The editors and authors begin with one of the key questions addressed in the volume: “How do the Internet and other information and communication technologies (ICTs) alter the nature of literacy?” (p. 1). They argue that we are experiencing an “epochal change in technologies” and that we are “part of a larger historical phenomenon that is not fleeting” (p. 7). In particular, they claim that “literacy is no longer a static construct from the standpoint of its defining technology for the past 500 years; it has now come to mean a rapid and continuous process of change in the ways in which we read, write, view, listen, compose, and communicate information” (p. 5). Or, as they clarify, although recognizing that literacies shift and develop over ages, the speed and scale of change at this time are unparalleled. Digital literacies have been

adopted by so many, in so many different places, in such a short period, and with such profound consequences. No previous technology for literacy permits the immediate

dissemination of even newer technologies of literacy to every person on the Internet...[or provides] access to so much information that is so useful, to so many people. (pp. 2–3)

They claim that the continuous nature of this change will require

knowing how and when to make wise decisions about which technologies and which forms and functions of literacy most support one's purposes...the notion of literacy may have to be conceived in a situationally specific fashion, since it is no longer possible for anyone to be fully literate in every technology of literacy now available on the Internet. (p. 5)

The editors argue for an approach to development akin to an open-source model, citing von Hippel and von Krogh (2003), "invit[ing] everyone to the conversation in order to both define and study the constructs of new literacies, while establishing broad parameters so that people can connect their work to something specific" (p. 13). They state the following:

This is not some wishy-washy policy of "everyone in" for its own sake. It is a policy aimed at progressively pursuing depth, rigor, and sophistication in interdisciplinary research by forging connections where connections have yet to exist and by constructing a platform together for debate and conversation about essential issues in new literacies research and especially to create a space for exchanging ideas across traditional disciplinary borders, research communities, methodological divides, and cultural experiences from around the world. (p. 13)

They enlist the term *new literacies* to subsume different labels, such as 21st-century literacies, Internet literacies, digital literacies, multiliteracies, new media literacies, informational literacies, ICT literacies, and computer literacy. Implicit in their discussions is that the range of technologies includes a host of multimedia platforms that are wireless and for which there exists ubiquitous access.

The authors' and editors' approaches to new literacies reflect an interest in scholars from the United States, Australia, United Kingdom, South Africa, and Europe who are studying a diversity of digital learning and communication contexts (e.g., online projects involving Internet use, multimedia projects, games, blogs, or instant messaging [IMing]) and a range of theoretical perspectives. Many of their examples involve uses of multimedia and different forms of literacy that are representative of popular culture engagements, predominately in the western world. In terms of theoretical orientations, the focus on multimodalities as a key feature of new literacies draws heavily on theory from systemic functional linguistics, sociotechnical theory, theories of social construction of space and time, various kinds of network theory, elements of postcolonial

theory, feminist theory, theories of media, informatics, communication theories, hermeneutics, and theories of culture. They admit that new literacies is not "simply a technological, linguistic, cognitive, or social phenomenon in isolation from our common commitment to one another and the consequences of our work to assist with or deny full access to economic, educational, and political opportunity" (p. 4). However, their discussions of these new literacies do not extend in any measurable way to the issues facing developing countries or matters pertaining to, for instance, minorities, special needs students, marginalized students, or different community groups.

As you begin to read my review, it will be apparent that I have presented my comments for each section in the same sequence as they exist with this print volume. I would have preferred a different sequence and would recommend that readers or users of the volume take liberties. In this regard, I would hope readers navigate the volume and my review of the volume in a more targeted or selective fashion, more akin to what they would do were the volume online. Indeed, I wish the publication afforded opportunities for a fuller participation by its readers. It would be a shame if the volume is not refreshed by the tides of new ideas and additional conversations. My extrapolations throughout and in my closing remarks are intended to at least contribute to some possibilities.

Part I: Methodologies

The first section, "Methodologies," serves to demonstrate the "range of methodologies with which research on new literacies is currently taking place" (p. xiii). The chapters in this section are somewhat anchored in specific studies, which traditionally place more of a premium on preexisting versus emergent or situation-based research design. In other words, with few exceptions, the papers in this section tend to frame scholarly endeavors in a fashion that is decontextualized rather than fully situated—enlisting frames that are mostly imposed rather than derived from observations and analyses of the nature of these new literacies in situations or in ways that move across traditional borders.

The first paper in this section, titled "Toward a Connective Ethnography of Online/Offline Literacy Networks" by Kevin M. Leander, includes a substantial review of a number of separate studies offered by a range of investigators enlisting ethnographic tools and critical discourse analysis to uncover the nature and use of these new technologies in matters of positionality. As you would expect of any author, Leander's orientation is driven to some extent by his own interests and by issues that he deems important to the study of technology

on its own terms. In some ways, his paper approaches an ethnography of the ethnographers of technologies, bringing to the fore some powerful issues that have been raised relative to who should be studying what and how and also varied in accordance with the forms and functions of different literacies. He explores for the reader a number of quite provocative issues, including the role of the ethnographer as participant–observer versus voyeur, the potential of different general ethnographic frames across and within times and spaces, the possibilities and constraints of studying these new literacies in terms of connectivities/circulations/traverses, as well as Lemke's (2000) suggestion that it might take a village to study a village. I would suggest that perhaps the village would need to be global in nature or multi-layered, and multicultural.

Ronald E. Anderson, in his paper "Large-Scale Quantitative Research on New Technology in Teaching and Learning," reviews quantitative studies, primarily focusing upon large-scale assessment studies of digital technologies and computer literacies, including the advent of new literacies. He traces historical developments in terms of how digital literacies have been defined (from computer programming to the new literacies) and measured on a national and global scale. He outlines the rather motley history of attempts to assess digital competencies—citing examples of items that were enlisted; methods of data collection used; the ebb and flow of interests, funding, and methods (including the recent advent of qualitative and quantitative techniques)—and mixed views of the worth of these endeavors and their shortcomings in terms of their model-testing explorations.

In "Converging Traditions of Research on Media and Information Literacies: Disciplinary, Critical, and Methodological Issues," Sonia Livingstone, Elizabeth Van Couvering, and Nancy Thumim achieve what was suggested in the prior chapters—a link from research approaches to the different histories of these now-converging technologies (media literacy and informational literacies). Beginning with what they present as the key tenet—the purposes of literacy (democracy, participation, and citizenship; the knowledge economy, competitiveness, and choice; and lifelong learning, cultural expression, and personal fulfillment)—they discuss the critical traditions and different research questions and methodologies of pursuits in these separated areas. As they state,

it appears that the strengths of informational literacy research lie in its complex analysis of questions of access, while media literacy research raises key questions about critical understanding. In both approaches, however, we see the growing extension of existing methods to new objects of study, together with the use of multiple methods in research. (p. 121)

To some extent, they turn a refracted mirror on themselves to identify some possibilities as well as limitations of scholarly endeavors in these silo-ed areas.

Lori Kendall focuses upon a tool of scholarly inquiry—the qualitative interview—and how it may be used in the context of studying online research, including as an online tool. Her article, "The Conduct of Qualitative Interviews: Research Questions, Methodological Issues, and Researching Online," is refreshing in the cautionary-tale nature of its presentation as she illustrates and exposes the interview as a text that needs to be studied as its own provocation of meaning making, especially if used in the hopes of illuminating meanings other than what the interview itself provokes. Perhaps missing from her review is the growing body of research involving the use of technologies in the health sector as a therapeutic tool or in distance education, where online interviews and other interactional procedures have been widely used for some time.

The fifth contribution presents a social semiotic analysis of a digital game, or as the author suggests, "the most multimodal of texts" (p. 151). In this paper, "The Case of Rebellion: Researching Multimodal Texts," Andrew Burns uses his analysis of a multimodal game developed by a student in his third year of a research project to interrogate "how to approach the analysis of such texts" (p. 151) and the claim that social semiotics is, as Kress and van Leeuwen (1992) suggested, "the theoretical, analytical and descriptive branch of cultural studies" (p. 28). Through Burns's unpacking and detailed analyses of the texts, including the tracing of the steps, design, construction, and representational elements, he is able to demonstrate the limitations (e.g., analyses difficulties) and potential of social semiotics. In particular, he explores how social semiotics can help with the following: in understanding design elements, especially the signification and social meanings at play; in assisting a consideration of "creativity" as "a rhetorical process...as a cluster of evaluative discourses and social efforts to negotiate what is valuable and valued, especially in the aesthetic life of the society" (p. 165); and in exploring the transformative effects of the composition and experience of engagements with the game by the game maker and by the game participant. He argues that social semiotics provides what seems akin to the sociopolitical and linguistic tools needed to warrant the arguments made by the cultural studies theorists.

The final chapter in this section, "Experimental and Quasi-Experimental Approaches to the Study of New Literacies" by Jonna M. Kulikowich, approaches the topic of mixed methods in research on new literacies. Unlike the other authors in the volume, Kulikowich advocates for research that allows for a more systematic way of studying digital literacies as interventions across preset factors. The chapter assumes an approach to new

literacies that enables them to be studied as straightforward interventions with predictable outcomes and against fixed variables. Unlike most of the research presented in the volume, Kulikowich argues for studies similar to the response-to-intervention studies, in which treatment by aptitude effects are studied very systematically.

Collectively, the papers in this section offer some promising approaches to research, although they also miss or gloss over core issues. These include the central or most critical questions that should guide us, as well as a fuller consideration of the analytical frames that might be enlisted in these studies. In terms of the questions that should be addressed, I refer to Bloome and Paul (2006) in a volume of *Theory Into Practice* titled "Literacies of and for Diverse Societies." Bloome and Paul suggested that the overriding question, regardless of disciplinary perspective, might be,

How can educators' conceptions of literacy/literacies, as realized in curriculum and instructional practice, provide all students within our diverse society with access to deep learning in academic domains, a repertoire of sophisticated ways of thinking, critical analysis, and synthesis, while reaffirming them both as individuals and as members of caring families and communities with rich histories, languages, and futures[?]" (p. 295)

Missing from a fuller consideration are examinations of how these literacies develop over time. In addition, studies of these new literacies (e.g., gaming) seem to focus upon the use of these literacies at the point of output, or, in the case of gaming, upon the participant rather than the game developer or designer.

In terms of the frameworks and analytical tools, the volume tends to subscribe to a rather restricted set of frames—in particular, there is a tendency to stress semiotic analyses based largely upon Halliday's (1978) work. A recent symposium organized and chaired by Marjorie Siegel at the National Reading Conference was prompted by the need to begin to expand the theoretical bases and bridge the gap between theories and analytic tools for examining multimodality. This symposium began with a paper by Siegel and Panofsky (2008), in which semiotics was explored as a tool for examining forms of representation, including notions of transmediation emanating from the work of Peirce (1931–1935) and Siegel's (1995) earlier work. Other symposium papers explored Bakhtinian frames, visual analytic tools (Rogers, 2008), critical race theory, and feminism to analyze how youth critically position themselves through multimodal expressions (Taylor, 2008). Beyond this symposium and the semiotic analyses to date, I would hope that other frames inform this work and be informed by what is evolving.

Part II: Knowledge and Inquiry

Part II of the volume involves a series of papers that focuses on comprehension and learning via the Internet or within other hypertext environments. The authors of the papers and the editor of this section repeat the refrain that research exists across disciplines that remain rather separated. Although the authors bring together multiple disciplines within and across articles, there is very little overlap in the research that is compiled. Although learning via the Internet and hypertext is the focus of all the papers, there is variation in how learning is defined and differences in terms of the body of research from which different authors draw.

In "Learning, Change, and Power: Competing Frames of Technology and Literacy," Mark Warschauer and Paige Ware consider how literacy learning and technology are framed in terms of learning—especially in terms of achievement tests, change or its transformative influences, and technology's role in supporting social and economic equality. In terms of achievement gains, they argue that the impact of technology should be examined more differentially and situationally—essentially, they suggest that assessment of achievement should be done less generically and should instead enlist more specific assessments that are tied to the technologies, the situations, and the learners or users. This should be done in terms of different technologies that are engaged within different ways. In terms of transformation, the authors explore the dimensions of these new technologies (especially multimodal and Internet interfaces) to suggest the possibility that the advent of these technologies provides for new ways of engaging with a fuller range of ideas and peoples (interactively, globally, via alternative multimodal genres) depending upon the opportunities and engagements of the learner. Warschauer and Ware suggest that the three frameworks represent the ongoing research and perspectives that seem to be in place, somewhat akin to a triangle with the frameworks as the vertices. They argue that more emphasis should be given to a consideration of technologies in terms of issues of power. As they state,

Though we consider each of these three frameworks to be legitimate perspectives for researching technology and literacy, in the end we favor a power framework as being best able to integrate the strengths, while minimizing the limitations of the other two forms, at least in regards to understanding technology and literacy in school contexts.... A power framework can consider learning and change not as abstract ends but rather in the context of working to expand students' broader educational, social, and economic opportunities. (pp. 233–234)

Els Kuiper and Monique Volman, in their article "The Web as a Source of Information for Students

in K–12 Education,” examine the Web in terms of its use as a means of enhancing knowledge gain. To this end, the authors discuss the characteristics of the Web as a means of accessing or acquiring knowledge as well as what we know in terms of what learners might do with the Web to be successful, with the support of their teachers. The authors detail the characteristics of the Web’s architecture and content and then discuss readers’ search and location strategies to suggest a paradox—namely, that the Web invites users to engage with ideas in a fashion that seems antithetical to learning. They use this paradox to fuel their final argument for a fuller consideration of Web design elements, as well as for more research on how to foster the new-literacies skills of learners.

In “Where Do We Go Now? Understanding Research on Navigation in Complex Digital Environments,” Kimberly A. Lawless and P.G. Schrader explore design and learner-interface issues as they relate to the learner variable, Web features, and their relationships to the navigational-skill requirements for effective learning. In some ways, this paper complements Kuiper and Volman’s article in terms of the discussions about learner and design variables; in other ways, it reinforces a tendency to look at learning through a lens borrowed from prehypertext or pre-Web views of learning and learners. As with most articles in this section, I would like to see a consideration of the extension of learning in more complex terms, consistent with the notions of ill-structured knowledge domains presented by Spiro and his colleagues (e.g., Spiro, 2006b; Spiro, Collins, Thota, & Feltovich, 2003; Spiro, Coulson, Feltovich, & Anderson, 1988; Spiro & Jehng, 1990; Spiro, Vispoel, Schmitz, Samarapungavan, & Boerger, 1987) and tied to the research on sociocultural dimensions of learning across networks of learners and digital spaces, including the work on participatory culture discussed by Jenkins (2008).

In the fourth paper, “The Changing Landscape of Text and Comprehension in the Age of New Literacies,” Bridget Dalton and C. Patrick Proctor look at online comprehension and online texts in a compare–contrast mode with traditional comprehension studies. They pull together much of the current learning about text work, including online-comprehension studies. However, while touting the need for new models of comprehension, they appeared to anchor their recommendations on the use of these technologies in ways that are linked to more traditional practices and to how we presently approach reading in a computer-assisted environment.

Patricia A. Young’s paper, “Exploring Culture in the Design of New Technologies of Literacies,” is exceptional on a number of fronts. The author deals with issues that Warschhauser and Pare mentioned

as issues faced by minorities but did not delve into as systematically as Young does. In particular, Young presents a review of research on the needs of minority students who may not have access to digital learning tools and the lack of culturally relevant material that addresses local and diverse cultures. The paper looks at these issues and a range of different kinds of interventions (such as the use of multimodal platforms for students to explore and express their worlds and identities, culturally specific digital information, and software that affords cultural explorations specific to and across cultures, among others) to explore these possibilities and the benefits that can be achieved. At the same time, she scratches beneath the surface of these complex issues within a rapidly changing world where the capital value and the nature of digital engagements are intertwined.

Richard E. Mayer’s “Multimedia Literacy” continues the discussion of design issues based upon Mayer and his colleagues’ research into the best way to design short informational material to enhance understanding. Based upon cognitive principles of dual channels, limited capacity, and active processing, Mayer and his colleagues examined how to design informational multimedia messages that best support five major cognitive processes (selecting relevant words, selecting relevant images, organizing words, organizing images, and integrating ideas). His paper further details the 10 principles for “reducing extraneous processing in multimedia learning: coherence, signaling, redundancy, spatial contiguity and temporal contiguity” (p. 364). As he suggests, “Extraneous processing occurs when the learner must engage in cognitive processing that does not directly contribute to the learner’s building of a mental representation of the target material” (pp. 364–365). Within the realm of processing information text online, Mayer’s principles are directed at minimizing the learner’s extraneous processing and at managing what Mayer has suggested are the learner’s key cognitive-processing strategies. His principles offer a palate from which designers and educators interested in informational retrieval can enhance informational processing by developing better multimedia forms to represent information as well as support to enhance learners’ processing of these material.

Len Unsworth returns the reader to a social semiotic frame of reference for examining multimodal literacies in the final paper, “Multiliteracies and Metalanguage: Describing Image/Text Relations as a Resource for Negotiating Multimodal Texts.” Unsworth’s chapter represents a substantial contribution to what he acknowledges as nascent extensions of social semiotic descriptions to the rapidly shifting multiplicity of less-logocentric texts. He draws from a range of research addressing the nature and role of images and text,

including its use in a variety of contexts. He makes a strong argument for theory development and laces his discussion with the necessity for these developments to have a metalanguage vehicle to support learners and teachers. He argues for the need to develop knowledge of the social semiotic systems at play that goes beyond just the use of the systems themselves.

The extent of people's personal satisfaction...and professional effectiveness will be influenced by the multiliteracies expertise they acquire, including their understanding of how the resources of language, images and other modalities are deployed to make meanings. Such understanding goes beyond using the various semiotic resources of language, image, sound, and other symbolic system...to make meaning. It involves knowledge of...their meaning making potential—metasemiotic knowledge.... To develop this kind of metasemiotic knowledge as part of a multiliteracies pedagogy what is required is a "metalanguage." (pp. 377–378)

He proceeds to define this metalanguage by reference to the New London Group's (1996) notion that a metalanguage "describes meaning in various realms... textual, visual, as well as the multimodal relations between different meaning-making processes" (p. 24). I would posit that a core issue for educators to explore is whether students learn through using languages or by teaching about language—a metalanguage for multimodality—in some form or another.

Despite the inroads made by the authors in this section, there is a sense of incompleteness. The bodies of literature in the various papers had a little bit of overlap but never seemed complete enough for me to feel as if the authors had taken into account a comprehensive review of the field or a full consideration of past theories, research, or developments that were possibly pertinent. Most noticeable was the failure to theorize or consider collective knowledge and knowledge making (e.g., group or networked meaning making) and whether the knowledge is developing in a fashion that is complex, ill-structured, sustainable, or transferable.

In terms of collective meaning making, we need to recognize that digital meaning makers encounter different forms of transactions of meaning making not only individually but also as part of a collective or group or network. In these group or networked circumstances, literacies involve links, shared or joint meanings, affiliations, collaborations, and cooperation—a form of group meaning making akin to a jazz ensemble or consistent with what Jenkins (2008), building upon the work of Dyson (1988, 1995), labeled *participatory culture*.

In terms of the structure of knowledge, there is a need to go beyond notions of knowledge as fixed or coherent to models of knowledge that are possibly complex

and ill-structured. Spiro and his colleagues (Spiro et al., 1987, 2003; Spiro & Jehng, 1990) have extended the study of knowledge acquisition with technology based upon post-Gutenberg affordances of digital technologies and his theory of meaning making/knowledge acquisition (drawing from Wittgenstein, 1953) in what they suggest are ill-structured domains. Spiro, Collins, and Ramchandran (2007) have claimed that they have succeeded in the use of new media (video cases) to develop "open and flexible knowledge structures to think within context, not closed structures that tell you what to think across contexts" (Spiro, Collins, & Ramchandran, 2007, p. 95).

With few exceptions, one noticeable feature of this section's set of papers is a tendency to discuss hypertext and the Internet as enlisting design features and considerations of learner variables and processes in relation to conceptualizations of single versus multiple texts. Discussions of intertextuality seem limited to a restrictive set of work; they do not extend to reading and writing from multiple sources and research on coauthoring and collaborative meaning making (e.g., McGinley, 1992; McGinley & Tierney, 1989; Spivey, 1997; Tierney, 2009). Discussions of meaning making excluded a consideration of literary engagements with hypermedia-based fiction (see Dobson, 2007; Dobson & Luce-Kapler, 2005) or generative collective forms of knowledge development with wikis (e.g., Dobson, 2004).

In terms of long-term gains, there is a need for more extended studies of students and adults (engaged in using multimedia platforms for project development), where changes over time occur and where and how any changes in knowledge or the use of these literacies are sustained. To date, very few researchers have examined the relationship of new-literacies appropriation to personal, cognitive, and social possibilities akin to "genres of power"—new texts, new ways of negotiating meaning, and ways of knowing—the long-term advantages that they had been afforded and the relevance of the skills that they had acquired for their career aspirations and achievement of personal goals (Tierney, Bond, & Bresler, 2006). Selfe and Hawisher (2004) have brought to the fore the extent to which the social fabric of life and the advent of these new literacies are closely intermeshed. They highlighted how certain factors (e.g., race, gender, or economic circumstances) can contribute to sustained engagement in the productive use of digital technologies, which in turn contribute in positive ways to people's lives, including enhancing their view of the possibilities for a fuller participation in society.

Part III: Communication

Part III, "Communication," marks a notable shift in orientation to information. The section editors stress that the move toward viewing technology is embedded within social processes, situations, and practices, stating that it needs to be viewed differently, based upon such embedding in relationship dynamics. The editors stress that technology and the Internet are not a "monolithic neutral technology..." but are "constituted differently and assume different meanings within different contexts of appropriation" (p. 412). They stress that a key development has been the mediating role that online social networks (e.g., MySpace, Facebook, online games, blogs) play—especially the power, authority, and various forms of agencies that such mediated social engagements afford. The disconnect or gulf between these developments and educators' forms of "legitimate" uses are mentioned—especially the tension between the challenges versus the opportunities that these new forms of social-mediated forms of engagement might represent for schools.

In "Mediating Technologies and Second Language Learning," Steven L. Thorne explores "the implications and potentialities of teaching and learning additional languages through activities mediated by Internet communication and information environments" (p. 416). His review describes the range and history of developments in additional or foreign language learning and uses examples from research to present how the dynamics of language learning, culture, identity, and authority are manifested. In many ways, this field of study offers a powerful illustration of the varied nature of engagement across languages, cultures, time, place, and people—an engagement that is developmental and situation based. Although some literacy scholars might view these developments as outside their interest in the nature of the Internet, a discussion of these issues reveals them as central, especially as they illuminate the relationship between Internet possibilities and ways of communicating across diverse language users—discussions of issues around language learning, language socialization, and intercultural negotiations. Thorne suggests that the mediating nature of the technology operates in conjunction with language learning and culture via the different communication interfaces now available on the Internet.

While blogs are mentioned throughout the volume, "Of a Divided Mind: Weblog Literacy" by Torill Elvira Mortensen provides the fullest and most focused discussion of the advent of blogs and their role in terms of creating meanings and networking people and ideas on a number of different levels. As Mortensen relates the narrative history of blogs (as discussed by reflective users or researchers as well as

the media), she signals the significance of blogs and their derivatives on meaning making, the nature of the networked fragments, how these fragments connect, grow, or are deconstructed across networks, and what is newsworthy.

Gloria E. Jacobs shifts the focus to applying microanalysis to IMing text exchanges as social practices from a local and global cultural perspective. In "People, Purposes, and Practices: Insights From Cross-Disciplinary Research Into Instant Messaging," Jacobs describes a number of studies and observations of IMing aimed at peeling away the nature of the social practices at play. As Jacobs posits, "people use and remake a technology like IMing in ways that vary across contexts.... IMing is both shaping and being shaped by the people who use it" (p. 486). Jacobs argues that we need to look less at the technology per se and more at what is achieved or mediated by these technologies, from relationship building to information sharing to constructing selves.

Similarly, in "Gender in Online Communication," Jonathan Paul Marshall argues, "Whatever media is employed, communication is not simply about the transfer or exchange of information; all communication involves context, interpretation and error" (p. 491). He continues, "Context often involves situating ourselves with respect to others in a social field (e.g., status, role, proficiency, recognized dangers, etc.)...intertwined with relations of power or cooperation, and efforts to increase certainty, and it is always social" (p. 491). And, as he stated and demonstrated, "Gender is a major category with which people organize knowledge about each other and themselves, regulate the ways that they interact, and claim access to cultural privilege, knowledge, and status" (p. 492). He proceeds to explore a range of gender issues from comparisons of male and female Internet use and the participation of males and females in games, online-learning situations, e-mail interactions, blogs, chat rooms, and other sites as he discusses issues of power, identity construction, impersonation, affiliation, and agency. However, he seems to understate the dynamic and complex nature of these spaces and how individuals and groups are or are not located and displaced by them via blogs, chat rooms, listservs, or a combination of online or offline spaces (see Bryson, MacIntosh, Jordan, & Lin, 2006).

Part IV: Popular Culture, Community, and Citizenship: Everyday Literacies

Many of the issues discussed in Part III are extended in Part IV, "Popular Culture, Community and Citizenship: Everyday Literacies," where the editors and authors

provide an expanded and multifaceted sociocultural analysis of a range of different enlistments of digital technologies for different purposes by groups and individuals. In their introduction to these papers, literacy is defined less as interactions around texts and more as social engagements or practices.

Literacy cannot be reduced to the study of texts and reading and writing processes alone. New literacies...are conceptualized in terms of either engagement with new social practices (e.g., *producing* popular culture in multimediated ways, establishing and maintaining social networks and affinity spaces using a range of technologies), or in terms of social process (e.g., collectively solving problems; establishing, resourcing, and participating in spaces framed by affinities). (pp. 523–524)

Again, the authors of these chapters enlist a variety of theoretical perspectives to delve into these issues, often criss-crossing their explorations of these new literacies. As the editors suggest, their approach is a kind of hybridization of theories to examine what authors throughout the volume view as a rise of new literacies, a proliferation of networks, and an informational explosion arising from a host of new and emerging social practices. They reinforce a view of literacy aligned in a collective, including a range of forms of collaborations with others. As the editors note, “the conceptions of popular culture, identity, participation, and collaboration employed by the authors in this section collectively disrupt a text-centric view of literacy and advocate for a social, dynamic and complex approach to studying new literacies” (p. 527).

In her paper “Intersections of Popular Culture, Identities, and New Literacies Research,” Margaret C. Hagood traces the growth of interest in popular culture. As daily access to media has grown, a broader definition of text has emerged, including recognition of its sociocultural bases. In conjunction with unpacking different perspectives of popular culture (mass culture, folk culture, and everyday culture), she discusses a range of research that focuses on mapping the engagement of individuals and groups with various forms of text and how these individuals and groups formed their identities. With mass media, she postulates a rather top-down view of identity formation; with folk culture, she suggests a more bottom-up form of reader engagement—especially in terms of their participation and use of text. With respect to everyday culture, she notes that there is a range of different texts and ways that readers pursue participations and explore identities. She recognizes the proliferation and the complexity of popular texts, along with different kinds of participations and uses of these texts, in conjunction with the changing identities that readers might be exploring.

In her paper entitled “College Students and New Literacy Practices,” Dana J. Wilber focuses on the readers of these Internet texts, exploring the dearth of research around people who grew up within the digital world and who are usually considered the “first adopters”—in particular, 17- to 25-year-olds, including U.S. college students. Drawing from different surveys reported in different outlets, she examines the nature and extent to which college students use these new technologies more extensively in their personal lives than they do in their schooling. She discusses surveys tied to students’ use of gaming, IMing, blogs, and so on, especially for purposes of personal networking and exchanges. Her discussion of research in educational settings focuses on reported findings from selected observations of teaching and learning, surveys, and some more focused research on influences. Drawing upon Lankshear and Knobel’s (2003) suggestion of the two mindsets—“insider” mindset belonging to those who have grown up with digital technologies versus “outsider” mindset belonging to those who bring their traditional views to digital technologies—she argues from a research base how digital engagements support participatory learning, connectivity, multimodality possibilities, immediacy, and simultaneity, which may be in sharp contrast with how outsiders might construct or constrain digital learning. She points to the failure of past analyses in noting the benefits of the new technologies in examining these new literacies, especially as might be used by these insiders as a move toward new learning experiences and a new way of learning in the academy.

In “Just Don’t Call Them Cartoons: The New Literacy Spaces of Anime, Manga, and Fanfiction,” Rebecca Ward Black builds upon this theme to explore developments that have occurred with the advent of digital communications and expressions to three-century-old phenomena—anime (Japanese animation), manga (Japanese graphic novels), and fanfiction (texts derived from popular media by its fans). The three illustrate literacy practices that “traverse accustomed national, cultural, linguistic, and producer-consumer boundaries” (p. 584). With the global dispersion and global interactions afforded by ICT and digital technologies, she claims that these phenomena occur in a kind of third space “that is not dependent on common cultural, historical, or linguistic background, but instead relies on a shared discourse and semiotic repertoire linked to popular media and fan culture” (p. 584). In turn, she argues, as others have, for hybrid interdisciplinary studies of these new literacies and views of learning that address the “hybrid, multilingual, and multimodal forms of communication, and the temporal, spatial, and cultural fluidity of these new media and literacy landscapes” (p. 585). She uses the New London Group’s (1996) notion of hybridity or “articulating in new ways—established practices

and conventions within and between different modes of meaning ... (of discourses and genres), and ... across boundaries of convention and creating new conventions" (p. 85), or, as Ward Black stated, "rearticulating conventionally accepted modes of meaning ... to create new meanings" (p. 601) to analyze these developments as well as the learning and global literacy developments that occur. Her intent is not to suggest adding manga, anime, or fanfiction to the curriculum but to have them illustrated to provoke rethinking of schooling and the possible enlistment of such popular cultural engagements to inform new-literacies practices and build up the dynamics of representation, exchange, exploration, and invention. As she begins her article, she states,

New Literacy Studies scholars...have pointed out that many schools still operate from a mindset rooted in the Industrial Revolution that is "forged in physical space" and organized around the production of material goods (Lankshear & Knobel, 2003). Whereas, contemporary students are entering classrooms with a mindset that is "forged in cyberspace".... Most students today are accustomed to... information-based economies, where graphic art and online publishing software enable new forms of semiotic engagement and symbolic manipulation of media. Many of them are also well versed in ICTs such as synchronous chatting, webcams, avatars...in today's multicultural, multilingual, and multitextual networked spaces. (pp. 583–584)

Her paper highlights the nature and power of these engagements over time by various groups and especially in recent years online. She does not suggest that educators adopt anime, manga, or fanfiction but does highlight what educators might learn from them.

Teachers and educational researchers alike might be well served by paying close attention to the procedural forms of both teaching and learning that are going on in these spaces, as they represent the ways of being and knowing that adolescents find accessible and consequential for their lives. (p. 604)

Constance A. Steinkuehler, in the paper "Cognition and Literacy in Massively Multiplayer Online Games," moves from the field of anime and manga to the field of online games, discussing the relevance for the study of games for education on a number of grounds. They include the opportunity to step outside formal education to consider other potentials for technologies and, as she suggests, more importantly, how these games as a technology provide entry into other important technologies—that is, serve as precursors to learning and using other technologies. She also highlights gaming as an activity that pushes community participation in different ways. To explore the cognition, learning, literacy, community, and education potential of games, she takes as her vehicle a consideration of massively multiplayer

online games, given what she argues is their quintessential nature: that they are played online, involve self-created avatars, interact with gaming software and other gamers' avatars, and that they have a collaborative nature within the confines of the game or apart from the game itself. The author notes the power of studying the virtual world at the same time as she stresses the blurring that could occur as virtual worlds become part of everyday exchanges between individuals and groups. This might include economic matters, for example, as the value of the currency within a game is priced against world currencies.

Although mentioning the possibility of addiction to games, she discusses the merits and nature of studies that examine these virtual worlds as spaces for identity and persona explorations or role-playing, citing Turkle's (1995) important study *Life on the Screen: Identity in the Age of the Internet*. Mostly, Steinkuehler enlists the work of Gee (2003) and his use of discourse analysis as a means of grounding explorations of meaning making online. Specifically, she argues for studies of the use of discourse to examine shared discursive practices in the production, coordination, and enlistment of language to achieve social goals and material purposes. In her view, this should include the achievement of routines with the game as well as with everyday lives in manners that are coherent and semiotic and that leverage issues of identity.

Kurt D. Squire, in "Video-Game Literacy: A Literacy of Expertise," builds on this theme, making arguments that complement those offered in Steinkuehler's paper. To Squire, the quintessential character of games is tied to interactivity in terms of game-playing as well as among the "constellation of users." He argues for the relevance of games in terms of their nature as cultural artifacts and in terms of a community of practices, then discusses them as being akin to design experiments for simulated worlds. In addition, he examines the instructiveness of games for education in terms of what we can learn about improving learning through what we have learned from the study of gaming. Additionally, he points out that gaming literacies may be a means of supporting other literacies—especially critical literacies. He deconstructs the discrediting of gaming and attributes of gamers by schools and the media (e.g., independence, multitasking, disrespect for authority) and provocatively questions whether gamers may not have the qualities desired for a "new economy."

In the paper entitled "Community, Culture and Citizenship in Cyberspace," Angela Thomas explores several core issues that are crucial to understanding the nature of identities and the role of the human interface with technology. In the first part of the article, she addresses the nature of cyberspace and the relationship between the body and the escape from the body that

some might tout as some kind of ultimate (dis) location, displacement, or engagement. Drawing upon Haraway (1991) and others, she argues for the notion of cyborg, or Shinkle's (2003) notion of "interfaced being," without discounting the merits of considering the unwired state of one's embodiments. Thomas then proceeds to discuss the notion of cybercommunities and cybercultures from the perspectives of different disciplines, from observations to detailed descriptions to critiques. She then turns her attention to discussions of the Web 2.0 as an attitude that has infused notions of Internet participation, as in community networking and examining wikis, Flickr, and blogs. Whereas she argues for the potential of Web 2.0 forms of participation and networking for educators, she also suggests the need for a metalanguage about the social semiotics of design elements and forms of critique not unlike fanfiction. More broadly, she makes mention of the need for social critique, especially in terms of issues of access.

In "New Literacies and Community Inquiry" by Bertram C. Bruce and Ann Peterson Bishop, the lens of progressive education, especially that of John Dewey, is applied to considering the relationship of new literacies to community inquiry—in particular, how community inquiry shapes and is shaped by digital literacies. Adopting a range of views of what might constitute community and the types of inquiries with which the community might become involved, Bruce and Bishop detail progressive educators' views of inquiry situated within and derived from different communities' needs and goals, as negotiated in a reciprocal fashion between individuals and groups.

Community inquiry...emphasizes the need for people to come together to develop shared capacity and work on common problems in an experimental and critical manner...respond to human needs by democratic and equitable processes...learn about community and its situation...recognize that every member of the community has knowledge which may be critical to solving a problem, but can be discovered only if that individual has a voice...and help communities become learning organizations. (p. 711)

Within this Deweyian framework, technologies are seen as tools for problem solving and, as such, can take various forms and might be best viewed "as representing the ongoing processes of community inquiry" (p. 716) or learning and should be considered in terms of their adapted use for inquiry. They might also help achieve community goals, related to the emerging notion of community informatics, which addresses how technologies support community needs in areas such as health, civic engagement, and the like. In a rich, complex, and illustrative manner, Bruce and Bishop provide several vignettes of how community inquiry proceeds and new literacies engage and develop in different settings.

Bruce and Bishop's discussion of inquiry is an excellent precursor to the next section on instruction and assessment.

Part V: Instructional Practices and Assessment

Part V, "Instructional Practices and Assessment," focuses on "how best to prepare students for the new literacies of online learning" (p. 745). As the editors note, the authors in this section highlight the major paradigm change that may occur with literacy education, while lamenting the present gap that persists. They suggest the need for a new paradigm but do not appear to agree on what this might mean in terms of goals and practices within different educational settings or how to transition from traditional to contemporary learning engagements that are critical and innovative in ways that address issues of language, societies, and ever-changing new literacies. In the introduction to the volume, and occasionally highlighted throughout (e.g., Thomas and Bruce & Bishop), there is a call for reenvisioning learning practices, but it is a call to which they do not respond. The placement of this next section seems to befit the tendency throughout the volume to discuss theory and research and then extrapolate to practice rather than develop a theory based upon use in instructional settings, despite the existence of such attempts. For example, Sandholtz, Ringstaff, and Dwyer (1996), Dwyer (1996), and Reilly (1996) studied the Apple Classroom of Tomorrow for several years en route to suggesting an instructional frame—in particular, the importance of an approach to developing new literacies that was authentic, interactive, collaborative, resource-rich, and inquiry-driven and that viewed knowledge transformation and its assessment in a fashion that was performance based and that afforded access to and support for multiple representations of ideas. Jenkins et al. (2008) has engaged in similar pursuits as they have attempting to unpack the concept of participatory culture in relation to schooling. As with Dwyer, Jenkins and his colleagues have argued that the nature of the collective enterprise is key. In particular, they have suggested that for participations to be successful, there needs to be relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship, whereby what is known by the most experienced is passed along to or able to be accessed by novices—where members believe their contributions matter, and there is a sense of communal connection with one another.

Guy Merchant, in "Digital Writing in the Early Years," starts out the section by exploring the productive aspects of writing with new technology and the

implications this has for pedagogy. Merchant begins with a review of the research detailing children's experiences with digital writing prior to formal schooling, then discusses questions and research around possible experiences that children might be provided with. In the initial section of his article, he makes a call for recognizing the different opportunities that children are afforded while simultaneously making a call to build upon what students have experienced. In discussing curriculum, Merchant discusses three models: sequential (from traditional, controlled writing experiences transitioned to digital opportunities); dual, or parallel, strands of traditional, print-based writing development with digital writing experiences; and what he deems as radical but preferable: an infusion approach, where students are afforded the opportunity to engage with digital technologies from the outset of schooling. Merchant acknowledges there is a lack of published research and development on digital writing overall, due in part to the limitations of some of our more positivistic research traditions and the failure to address the complexities of rich context or build a model of digital writing that involves a vibrant consideration of writing as social practice. Some mention is made of what digital writing affords as a communication and collaborative tool but, as he suggests, the focus to date seems to be primarily on an individual's fluency rather than on the use of writing (in conjunction with other tools) in a fashion that is communal rather than solitary.

Drawing upon notions of multimediation in conjunction with studies of youth engagement with popular-culture texts (e.g., Moje & van Helden, 2004), Richard Beach and David O'Brien, in "Teaching Popular-Culture Texts in the Classroom," discuss the learning potential of multimodal creations and recontextualizations, as well as the interrogation of popular text and the prowess of youth engagements with these texts—primarily out of school. At the same time, the authors try to bridge to traditional schooling or suggest how the use of popular texts might be enlisted. In particular, the paper represents an exploration of what is learned with or from engagements with popular culture texts as they occur and are used (especially by youth) outside of school, as well as their possible relevance for schools. Beach and O'Brien make the case that "because popular-culture texts are ubiquitous, intertextual, and intermedial, they are themselves creating pedagogical spaces within and outside of schools, spaces in which students acquire a range of literacy practices" (p. 775). They also argue that "popular-culture texts are so ubiquitous, interconnected, and recursive that it is almost an anachronism to try to distinguish popular-culture texts from other texts" (pp. 798–799). They make the case for the use of popular texts in schools, assuming the appropriate and careful use of strategies that will enlist these texts

as part of the school curriculum in ways that make meaning with students in vibrant and engaging ways. In some ways, the authors walk a fine line as they suggest and illustrate a range of strategies that can be used to enlist, interrogate, and learn from and with students' engagements with these texts. This might be viewed as a form of recontextualization or colonization of these texts by schools in ways that they admit may be viewed with cynicism.

In "Using New Media in the Secondary English Classroom," Ilana Snyder and Scott Bulfin review the research and theoretical developments involved in what they label a *new communication order* in a fashion intended to "provoke readers to reevaluate the ecology of secondary English" (p. 806). To these ends, they review key theoretical concepts related to the new-literacies studies, multimodality, cultural form, and the notion of remediation or the refashioning that occurs when the old mix with the new. They proceed to review a range of research and development efforts across settings (including some mention of students with special needs and indigenous students) with digital literacies that have pertinence for rethinking or informing English classrooms. While highlighting the possibilities, they also stress the challenges, including the "retro" or resistance to such advances. Rather than offer comprehensive guidelines or prescriptions for proceeding, they see their review as encouraging "think[ing] outside the box" and affording teachers ideas by which to "remove themselves from where they have been placed by curriculum regimes" (p. 829) as they contemplate ways to engage students in meaning making in exploring the constraints and possibilities of their world. They make a call for research encompassing access, interpretation, and critique—that is, dealing with issues of access and equity as well as research directed at restructuring English classrooms and curricula so that they move broadly from "'English-as-literature' and 'English-as-language' to include 'English-as-communication,' 'English-as-semiosis' and 'English-as-rhetoric'" (p. 829).

In contrast, Bettina Fabos, in "The Price of Information: Critical Literacy, Education, and Today's Internet," problematizes the Internet on political and economic grounds. In turn, she uses the pervasive commercialization of the Web to question whose information counts as a basis for arguing for the importance, if not the imperative, of approaching the Internet using a critical theoretical lens in classrooms. Her article serves to bring to the foreground the politics and economics of knowledge and the historic developments of the Web that appear to have followed the same course as radio and television. As she notes, in both radio and television, educational worth was supplanted by commercial interests through a form of "bait and switch," or creeping subliminal messaging and control. She argues

against these developments at the same time as she advocates for strategies from informational literacy and critical theory as a basis for ensuring the nature of these developments are recognized, critiqued, and thwarted. She whets one's appetite for a fuller discussion of teaching and learning, as well as a broader consideration of the commercial nature of the "Academy" and the material interests of those who profit from serving the public good. In this she includes universities in the modern age, researchers, and even theorists who critique that from which they themselves may stand to gain. Although a critical theoretical lens has been advocated across several papers in the volume, her discussion of these issues appears to stand alone.

Consistent with Pippa Steins legacy, the next paper forges ahead with educational pursuits informed by current thinking from social semiotic theory, notions of multimodality, multimodality, critical theory, transduction, and hybridization. In "Multimodal Instructional Practices," Pippa Stein discusses, in a rich and inclusive fashion, selected international curriculum developments and informative research studies. Her review of pertinent literature and her extrapolations about constraints and possibilities afford educators several elements for curriculum development that she argues is necessary for the possible advancement of multimodal instructional practices and methods befitting the assessment of their enlistments. She discusses the learners as engaged in the design and assembling of image, text, sound, and other modes in a fashion akin to an ensemble.

Claire Wyatt-Smith and John Elkins's chapter "Multimodal Reading and Comprehension in Online Environments" represents an important addition to this volume, especially in terms of the research literature that they draw together around online meaning making. Throughout the papers in this volume, several of the same major theorists and researchers are cited repeatedly as the sociocultural dimensions of new literacies are explored. In this paper, Wyatt-Smith and Elkins extend these discussions to recent research and formulations of online meaning-making processes by drawing upon the key work of research analyses by Coiro and Dobler (2007), Castleton and Wyatt-Smith (2005), Reinking (2005), and others. They also tie in pertinent notions from Luke and Freebody (1999) on the roles of readers as meaning makers, Green (1999) on the notion of ensemble, and Bruce (2000) on the discussion of the reader's position and agency as a meaning maker (exegetical, dogmatic, agnostic, dialectic). In so doing, they present an extended discussion of the state of current knowledge and of the nature of online meaning making, including differences, difficulties, possibilities, and strategies unique to or adjusted to online circumstances, tied to representational, design, and other

considerations. The reach of this paper suggests that it might have been expanded into several papers, which could have constituted their own section of the volume, allowing for an even broader consideration of meaning-making processes from a variety of reader, writer, or designer perspectives across a fuller and more complex mix of modalities for individuals and groups.

In "Assessing New Literacies in Science and Mathematics," Edys S. Quellmalz and Geneva D. Haertel explore the role of performance assessment in the use of digital technologies, consistent with principles touted in the publication *Knowing What Students Know: The Science and Design of Educational Assessment* by Pellegrino, Chudowsky, and Glaser (2001) and aligned with the National Research Council report *How People Learn* by Bransford, Brown, and Cocking (2000). The principles underpinning these forms of assessment strive to examine the processes and strategies of online meaning making (e.g., planning strategies, forms of collaboration, self-monitoring of tasks, or problem solving/inquiry approaches), including proficiency with the tools enlisted (e.g., Internet searches or database use) and the products or outcomes of pursuits. On the one hand, the approach reflects an openness to complex learning tasks consistent with those envisioned in discussions of the new literacies. On the other hand, they strive for consistency and a systematic or standardized form of judging or measuring performance on prescribed rather than emerging learning. As Quellmalz and Haertel admit, they lack a substantial body of research to ensure the credibility of such assessments. The focus on science and mathematics projects seems more straightforward when considered against offline assessments, but they refrain from assessments that delve into more complex online activities (e.g., multimodal hybridization, forms of representation, simulations—activities that are enlisted as meaning makers explore and transform texts and images in a way that affords a complex braiding of information and expression).

Colin Baskin and Neil Anderson round out the section by tracing the development of information technology services and the move to standardization and content-driven technologies in their article, "Learning Management Systems and Virtual Learning Environments: A Higher-Education Focus." Using developments in Australian higher education as illustration, and new literacies as a comparison point, they suggest that university technology infrastructures may have stagnated innovation and may be perpetuating a form of teaching that is overly content driven, rigid, prescribed, and restrictive—especially if teaching and learning is to be synchronized with dynamic and more open socially constituted or constructed learning.

Part VI: Multiple Perspectives on New Literacies Research

For the reader of this volume, the last section of the book offers a powerful form of more concrete engagement with alternative ideas and perspectives by other researchers, educators, and different theorists. It has the feel of a cosmopolitan café, in which different conversations among a diverse and even motley crew occur around issues and events. Here, the editors make a major shift from the publication of research syntheses to the reprinting of a diverse set of previously published research papers with commentaries by key scholars who might offer different perspectives. The papers in this section address a potpourri of topics already discussed in the book and include articles on gaming, IMing, and classroom practices.

The first set of articles offers a discussion around gaming grounded in a very interesting survival game (with mobile units for individuals and a white board for collaborative strategic learning) where students become lions participating together as a den striving for domination and survival. In this article, “Savannah: Mobile Gaming and Learning?,” Keri Facer, Richard Joiner, Danaë Stanton, Josephine Reid, Richard Hull, and David S. Kirk explore the nature of students’ engagements and collaborations via observations and discourse analysis. Critiques of the article are offered by James Gee in his paper, “Being a Lion and Being a Soldier: Learning and Games” and by Susan R. Goldman and James W. Pellegrino in their paper, “Savannah: Mobile Gaming and Learning: A Review Commentary.” The commentaries offer further insights into gaming but also critiques of and suggestions for the game and gaming as an educational tool via feedback for how Savannah was enlisted. The commentaries also connect the work to other research and broader issues, and they discuss the paper in terms of the quality of the scholarship. Missing from fuller consideration are the elements that gaming shares with other forms of engagements, so that we might peel away at how game players and game designers engage in learning and participating in these games in ways that could inform other forms of learning and engagement. It is as if the papers stay too close to the study at hand.

The second set of articles, concerning the quality of students’ meaning making on the Internet, is examined via an exploration of Web-based resources, with the support of scaffolding software to assist with inquiry. In turn, this exploration is discussed in terms of implications for the Web and scaffolded support for students and their search strategies. In the initial article, “The Nature of Middle School Learners’ Science Content Understandings With the Use of Online Resources,” Joseph L. Hoffman, Hsin-Kai Wu, Joseph S. Krajcik, and Elliot Soloway report the results of past

surveys and their own study of students’ Internet explorations, strategies, and knowledge outcomes, drawing comparisons across students who perform and are engaged more or less successfully. The original submission is followed by two commentaries, “Intertextuality and the Study of New Literacies: Research Critique and Recommendations” by Peggy N. Van Meter and Carla Firetto and “Internet Pedagogy: Using the Internet to Achieve Student Learning Outcomes” by Robert E. Bleicher. Both commentaries credit the merits of the work at the same time as they question the scope and depth of their analyses—suggesting important considerations by which the work should be extended and would be enhanced. They discuss the need to focus more on the intertextual nature and demands of integrating resources and the need to explore and describe learning more fully through a closer and richer examination of student learning, including their interactions with one another.

In the third set, “Instant Messaging, Literacies, and Social Identities” by Cynthia Lewis and Bettina Fabos is reprinted and discussed by two former editors of *Reading Research Quarterly*, Donna Alvermann and David Reinking, who were responsible for its publication. As they note, the Lewis and Fabos article is the most widely viewed article that *Reading Research Quarterly* has published online and one of the more-cited articles in the current handbook. As both past editors indicate, the article offers a rich array for discussion, from the observations that were made to the analyses that were afforded and the issues that it brought to the fore. Lewis and Fabos do an extraordinary job of bringing to life and highlighting the rich complexity of students’ uses of IMing across multiple layers, networks, and persona simultaneously in different ways with others and their other selves for different reasons. As both commentators note, the article is provocative in the rereading and brings to the fore the rich social face of new literacies.

In the fourth set of papers, “L2 Literacy and the Design of the Self: A Case Study of a Teenager Writing on the Internet” by Wan Shun Eva Lam is reprinted with two commentaries, “Critical Review: L2 Literacy and the Design of the Self: A Case Study of a Teenager Writing on the Internet” by Catherine Beavis and “A Commentary” by Richard P. Duran. Lam’s article represents a case study of a second-language (L2) learner that moves the reader across a range of issues surrounding L2 learning and that describes the Internet as a vehicle for exploring issues of language and oneself in the world as one strives and struggles to learn language. In the case study, Lam draws upon issues of identity, roles, and voice as one explores learning English via one’s own interactive website as one interacts with others globally. The two commentators reorient the reader to the relevance of Lam’s work to broader L2 issues as

they delve further into her case study as the stem for discussing a host of current issues involved in L2 situations and learners' engagement with the Internet, both interpersonally and as constrained by the commodified and political structures around L2.

In the final set of articles, schools as sites for new literacies are examined in conjunction with an exploratory study of teachers' reported use of digital technologies. The initial article in this set is "The Journey Ahead: Thirteen Teachers Report How the Internet Influences Literacy and Literacy Instruction in Their K-12 Classrooms" by Rachel A. Karchmer. The two relevant commentaries are "Researching Technology and Literacy: Thirteen Ways of Looking at a Blackboard" by Colin Harrison and "Internet Literacy Influences: A Review of Karchmer" by Jackie Marsh. In my view, the article by Karchmer weighs the limited views and use of digital tools in classrooms against the discussion of new literacies and the possible implications raised throughout this volume. As Harrison suggests, the shelf life of any article on new literacies may be short given the speed of change. He also makes a point to which I will return in my discussion—namely, the talk of new literacies in schools far exceeds their presence. The dominant traditions of print seem quite intractable, while new literacies flourish on the fringes.

Some Closing Remarks

So What's New About New Literacies?

What is new about new literacies seems more adverbial than adjectival—that is, more ongoing than fixed. As you read the chapters in this volume—especially those that portray the vibrancy of the advent of new literacies in popular culture—it is the society-forming character of online digital spaces, the ongoing participatory nature of these spaces, the edginess of multimedia representational forms, the ever-expanding knowledge explosion, the new configurations of strategies demanded by online digital spaces, as well as the experimentation with ways of transacting meanings and pushing on communities or networks, that seem most striking. The newness is in the use of these literacies in multifaceted ways, including ways of building as communities and new forms of exchange, means by which to creatively problem solve or express oneself or to explore ideas via simulations, within virtual environments, in multimodal frames, face to face, remotely synchronized or asynchronized, or via blogs, wikis, or Twitter. There is a newness to even the revisiting or rereading of an engagement or interaction with colleagues around a matter of mutual interest, where you are providing updates, IMing, gaming, or engaging with one another as avatars. However, sometimes, the newsworthiness is

quite striking. For example, take if you will the posting of a guitar solo by the young adolescent from Korea on YouTube (www.youtube.com/watch?v=QjA5faZF1A8) and the subsequent emulations by others and later the adolescent again. It is akin to some of the basic tenets of communication, as has been discussed by pragmatists, that language in use involves a transaction that is sincere, perspicuous, and newsworthy. There is a kind of edginess to this pursuit, not unlike the artist's pursuit of seeking something unsafe and not predictable. To be a participant involves placing oneself in a dialogue with others as one pushes across, with, by, from, in, and for communities.

How Well Does the Handbook of Research on New Literacies Provide a Basis for Understanding the Nature of These Transactions?

I would posit that the work to date tends to propel an approach to online meaning making that seems to be powerful in terms of differentiating online meaning making from offline meaning making but restricted in terms of a consideration of multimodal or social dimensions and somewhat biased toward a receptive versus constructivist model of meaning making. Much of the work is tied to a rather restricted Web-based environment and is directed at locating and assembling ideas. Their models do not offer conceptualizations of meaning making that involve composing across multiple sources, as an architect or designer of compositions might proceed. I would argue that this work fails to address the roles played by ideas and their integration or expression over time in a manner that addresses visually oriented or linked, layered, or networked meaning affordances. The work tends to ignore the role of others or the social dynamics at play, which suggests that all meaning making involves a form of social negotiation with others or groups versus individual transaction.

Inversely, the discussion of meaning making in terms of communication and popular culture falls short of connecting the ideas and their architecture to the social functions that they serve during ongoing development by the composer. There is a great deal needed to extend their model of meaning making to other situations and genres as ideas, images, thoughts, and hunches are imagined, constructed, amassed, connected, reframed, structured, and savored, in concert with dissemination, sharing, transaction, and negotiations back and forth, in partnership, through codevelopment, or as an ensemble. For example, the discussion of meaning making as a form of participation fails to connect the participatory culture or ways of working together to create projects and exchanges of ideas that are developed, configured, etc. How individuals and groups circulate,

connect, affiliate, or mobilize as a group or as subsets of meaning makers needs to be examined in terms of the thinking that occurs. The roles of the ideas, concepts, or expressions themselves in relationship to the changing engagements among meaning makers need to be considered. We experience affiliation in a group that is harmonious or not; accommodating or assimilative, vibrant, provocative, integrative, or disintegrative. These developments occur over time and place, shaping the group and influencing the individuals within the group, as well as the group's and individuals' relationships with other groups and individuals. Whereas some of these social dynamics are highlighted in the discussions of gaming, blogs, and IMing, the core elements remain unpacked and are discussed superficially. New literacies in all of its forms involves a shaping of self and selves that is integral to understanding the meanings that are used and how they shape engagements and the plays we make with one another, in groups or via networks for whatever purposes (Tierney, 2009).

Generally, there is a tendency to reference the possible importance of the multimodal, ideational, and social elements at play in an effort to acknowledge their relevance, at the same time as excuses are made regarding their neglect. The shaping with and negotiation of text, image, and other sign systems requires a model of composing that is simultaneously dealing with how ideas or concepts might be configured, as well as design considerations, which will impact the expression of these ideas and concepts. The dynamic nature of the twists and turns of exchanges should be highlighted and further exploration pursued of the nature and role of images (including illustration, stills, video clips, animations), as well as audio interfaces in composing and ongoing exchanges of ideas. The nature, role, and engagement with these multimodal elements should include delving into the digital meaning maker as archivist, cultural historian, social critic, activist, public journalist, researcher, and community worker. These productions might be examined in terms of their representational and transmedial potential—cognitively, aesthetically, culturally, and socially. Lest their potentials are not realized and the possible uses languish or fail to achieve their promise, educators need to recognize the resources, skills, and strategies that might be needed to be mobilized.

Although social semiotic analysis has been touted as achieving some understanding of the nature and socialization powers of multimodal exchanges, oftentimes these analyses seem more focused on the instrumental and regulatory functions rather than on the interactive and personal. It seems disconnected from the actual meaning-making processes and emergences (ideational and social) that are happening via and within affiliations as multilayered and multimodality function texts

are played with—especially to push communities in new ways, befitting the edginess with which conventions and norms are improvised. I remain uncertain as to whether social semiotics lives up to its calling. As Hodge and Kress (1988) have suggested, social semiotics needs to explain how the social shaping of meanings works in practice at different levels of societies, as well as across and within communities or individuals.

Unfortunately, the discussion of global developments received scant mention. There was very little discussion of the advent of these literacies on a global scale and the sociocultural and economic considerations that a global scale would entail. Looked at globally and locally, literacies have shaped and are shaping how we live together and who we are. However, taking your place as a participant may not be as straightforward as the invitation might suggest. Economic circumstances and/or social constructions of engagement with these technologies might preclude and will shape the possibility of access, agency, and constructions of self. It may be that layers of imposition and subordination or liberation are added. Certainly, these digital expansions are harbingers for reductions in other areas—for example, culture and language variation. Indeed, standardization and global platforms for exchanging images and ideas are the means by which these technologies have advanced. Essentially, we can shape and be shaped by these literacies. As Butler (1997) argued, and as Ruitenberg (2008) explained, we are neither passive nor autonomous agents, but “both depend upon, and can make changes to, discourses that precede and exceed them” (pp. 265–266). Such dynamics are striking and their impact may be profound as we experience epochal change with the advent of the new literacies and how they influence our worlds and our meanings and how they afford us a voice. Indeed, these literacies seem to be sites of contestation for freedom of expression and open exchange as well as control and surveillance. In particular, President Obama's own Internet use became an issue when he requested an accommodation by White House security to use his BlackBerry. As Jeff Zeleny (2009) noted in his *New York Times* article entitled “For a High-Tech President, a Hard-Fought E-Victory,” his license to use a BlackBerry was made contingent upon limiting his access and ensuring his, and arguably others, security.

“The president has a BlackBerry through a compromise that allows him to stay in touch with senior staff and a small group of personal friends,” said Robert Gibbs, his spokesman, “in a way that use will be limited and that the security is enhanced to ensure his ability to communicate.”

First, only a select circle of people will have his address, creating a true hierarchy for who makes the cut and who does not.

Second, anyone placed on the A-list to receive his e-mail address must first receive a briefing from the White House counsel's office.

Third, messages from the president will be designed so they cannot be forwarded. (p. A18)

Perhaps the area in which I am most reserved or concerned pertains to schooling. I find myself concerned about the questioning or lack of questioning about schooling in the volume. As Street (2006) argued and Harrison has suggested (this volume) that outside of schools there is often an interest in global issues, networking, websites, multimodality, flexibility, and so on; whereas inside schools, there is often a tendency to stress stability and unity. In North America, paper-and-pen technologies still dominate, inside-the-head versus social models of learning guide teaching and testing, print seems to remain more privileged than images, and apart from keyboarding and the use of a few other tools of technology, with a few exceptions, the technology changes that are contributing to changes in our lives outside of school are not occurring within the confines of our classroom or school lives. As an educator, I am envious that discussions of the use of the new literacies and the most interesting research and theorizing seem directed at engagements of these literacies on the fringes of schools. I am concerned that schools are not sites from which these or other developments are being launched, spurred, or expanded. The role of new literacies in relation to schooling and learning deserves a fuller discussion online and not this ending.

Not the Last Word

As we move forward, in part by looking back, we should be careful not to perpetuate a McLuhan's rear-view vision effect (McLuhan & Fiore, 1967) that inhibits our ability to make some of the turns that we might pursue, turns like the following: (a) a multimodal and multi-layered turn by moving to models that are less verbo-centric, are more complex and layered—perhaps more informed by visual studies; (b) a social turn, formulating communal notions of meaning making rather than relying on individual “inside the head” information-processing models; and (c) a developmental turn by constructing models of meaning making that address growth, evolution, sustainability, and intervention in terms of helping us make progress especially because, as educators, we strive to support the advancement of learning communities for a future informed by, but not stuck in, our pasts.

References

- Bloome, D., & Paul, P. (2006). Literacies of and for diverse societies. *Theory Into Practice*, 45(4), 293–295.
- Bransford, J.D., Brown, A.L., & Cocking, R.R. (Eds.). (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.
- Bruce, B. (2000). Credibility of the Web: Why we need dialectical reading. *Journal of Philosophy of Education*, 34(1), 97–109. doi:10.1111/1467-9752.00158
- Bryson, M., MacIntosh, L., Jordan, S., & Lin, H.L. (2006). Virtually queer? Homing devices, mobility, and un/belongings. *Canadian Journal of Communication*, 31(4), 791–814.
- Butler, J. (1997). *Excitable speech: A politics of the performative*. New York: Routledge.
- Castleton, G., & Wyatt-Smith, C.M. (2005). Investigating digital curricular literacies: Resolving dilemmas of researching multimodal technologically mediated literacy practices. In B. Maloch, J.V. Hoffman, D.L. Schallert, C.M. Fairbanks, & J. Worthy (Eds.), *54th yearbook of the National Reading Conference* (pp. 144–156). Oak Creek, WI: National Reading Conference.
- Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly*, 42(2), 214–257. doi:10.1598/RRQ.42.2.2
- Dobson, T.M. (2004, May). *Reading wikis: E-literature and the negotiation of reader/writer roles*. Paper presented at the annual meeting of the Canadian Society for the Study of Education, Winnipeg, MB.
- Dobson, T.M. (2007). Constructing (and deconstructing) reading through hypertext: Literature and the new media. In A. Adams & S. Brindley (Eds.), *Teaching secondary English with ICT* (pp. 80–97). Maidenhead, England: Open University Press.
- Dobson, T.M., & Luce-Kapler, R. (2005). Stitching texts: Gender and geography in *Frankenstein* and *Patchwork Girl*. *Changing English*, 12(2), 265–277. doi:10.1080/13586840500164540
- Dwyer, D.C. (1996). The imperative to change our schools. In C. Fisher, D.C. Dwyer, & K. Yocam (Eds.), *Education and technology: Reflections on computing in classrooms* (pp. 15–34). San Francisco: Jossey-Bass.
- Dyson, A. (1988). Negotiating among multiple worlds: The space/time dimensions of young children's composing. *Research in the Teaching of English*, 22(4), 355–390.
- Dyson, A.H. (1995). Writing children: Reinventing the development of childhood literacy. *Written Communication*, 12(1), 4–46. doi:10.1177/0741088395012001002
- Gee, J.P. (2003). *What video games have to teach us about learning and literacy*. New York: Palgrave Macmillan.
- Green, B. (1999). The new literacy challenge? *Literacy Learning: Secondary Thoughts*, 7(1), 36–46.
- Halliday, M.A.K. (1978). *Language as social semiotic: The social interpretation of language and meaning*. Baltimore: University Park Press.
- Haraway, D.J. (1991). *Simians, cyborgs, and women: The reinvention of nature*. New York: Routledge.
- Hodge, R., & Kress, G. (1988). *Social semiotics*. Cambridge, England: Polity Press.
- Jenkins, H. (with Clinton, K., Purushotma, R., Robison, A.J., & Weigel, M.). (2008). *Confronting the challenges of participatory culture: Media education for the 21st century*. Retrieved from www.digitallearning.macfound.org/art/cf/7B7E45C7E0-A3E0-4B89-AC9C-E807E1B0AE4E7D/JENKINS_WHITE_PAPER.PDF
- Kress, G., & van Leeuwen, T. (1992). Trampling all over our unspoiled spot: Barthes' “punctum” and the politics of the extra-semiotic. *Southern Review*, 25(1), 27–28.
- Lankshear, C., & Knobel, M. (2003). *New literacies: Changing knowledge and classroom learning*. Buckingham, England: Open University Press.
- Lather, P. (2008). *Getting lost: Feminist efforts toward a double(d) science*. Albany: State University of New York Press.

- Lemke, J.L. (2000). Across the scales of time: Artifacts, activities, and meanings in ecosocial systems. *Mind, Culture, and Activity*, 7(4), 273–290. doi:10.1207/S15327884MCA0704_03
- Luke, A., & Freebody, P. (1999). A map of possible practices: Further notes on the four resources model. *Practically Primary*, 4(2), 5–8.
- McGinley, W. (1992). The role of reading and writing while composing from sources. *Reading Research Quarterly*, 27(3), 227–248. doi:10.2307/747793
- McGinley, W., & Tierney, R.J. (1989). Traversing the topical landscape: Reading and writing as ways of knowing. *Written Communication*, 6(3), 243–269. doi:10.1177/0741088389006003001
- McLuhan, M., & Fiore, F. (1967). *The medium is the message*. New York: Random House.
- Moje, E., & van Helden, C. (2004). Doing popular culture: Troubling adolescent discourses. In J. Vadeboncoeur & L. Stevens (Eds.), *Re/constructing 'the adolescent': Sign, symbol, and body* (pp. 211–248). New York: Peter Lang.
- New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60–92.
- Peirce, C.S. (1931–1935). *Collected papers of Charles Sanders Peirce* (Vol. 1–6; C. Hartshorne & P. Weiss, Eds.). Cambridge, MA: Harvard University Press.
- Pellegrino, J.W., Chudowsky, N., & Glaser R. (Eds.). (2001). *Knowing what students know: The science and design of educational assessment*. Washington, DC: National Academy Press.
- Pitt, A.J., & Britzman, D.P. (2006). Speculations on qualities of difficult knowledge in teaching and learning: An experiment in psychoanalytic research. In K. Tobin & J. Kincheloe (Eds.), *Doing educational research: A handbook* (pp. 379–402). Rotterdam, The Netherlands: Sense Publishers.
- Reilly, B. (1996). New technologies, new literacies, new problems. In C. Fisher, D.C. Dwyer, & K. Yocam (Eds.), *Education and technology: Reflections on computing in classrooms* (pp. 203–220). San Francisco: Jossey-Bass.
- Reinking, D. (2005). Multimedia learning of reading. In R.E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 355–374). New York: Cambridge University Press.
- Rogers, T. (2008, December). *Spaces and positionings in youth video production: A move toward cross-disciplinary analyses of multimodal texts*. Paper presented at the meeting of the National Reading Conference, Orlando, FL.
- Ruitenberg, C. (2008). Discourse, theatrical performance, agency: The analytic force of “performativity” in education. In B. Stengel (Ed.), *Philosophy of education 2007* (pp. 260–268). Urbana, IL: Philosophy of Education Society.
- Sandholtz, J.H., Ringstaff, C., & Dwyer, D.C. (1996). *Teaching with technology*. New York: Teachers College Press.
- Selfe, C.L., & Hawisher, G.E. (2004). *Literacy lives in the information age: Narratives on literacy from the United States*. Mahwah, NJ: Erlbaum.
- Shinkle, E. (2003). Gardens, games, and the anamorphic subject: Tracing the body in the virtual landscape. Retrieved April 20, 2009, from hypertext.rmit.edu.au/dac/papers/Shinkle.pdf
- Siegel, M. (1995). More than words: The generative power of transmediation for learning. *Canadian Journal of Education*, 20(4), 455–475. doi:10.2307/1495082
- Siegel, M., & Panofsky, C. (2008, December). *Designs for multimodality in literacy studies: Perspectives and questions*. Paper presented at the meeting of the National Reading Conference, Orlando, FL.
- Spiro, R.J. (2006a). The “New Gutenberg Revolution”: Radical new learning, thinking, teaching, and training with technology... bringing the future near. *Educational Technology*, 46(1), 3–4.
- Spiro, R.J. (2006b). The post-Gutenberg world of the mind: The shape of the new learning. *Educational Technology*, 46(2), 3–4.
- Spiro, R.J., Collins, B.P., & Ramchandran, A. (2007). Reflections on a post-Gutenberg epistemology for video use in ill-structured domains: Fostering complex learning and cognitive flexibility. In R. Goldman, R.D. Pea, B. Barron, & S. Derry (Eds.), *Video research in the learning sciences* (pp. 93–100). Mahwah, NJ: Erlbaum.
- Spiro, R.J., Collins, B.P., Thota, J.J., & Feltovich, P.J. (2003). Cognitive flexibility theory: Hypermedia for complex learning, adaptive knowledge application, and experience acceleration. *Educational Technology*, 43(5), 5–10.
- Spiro, R.J., Coulson, R.L., Feltovich, P.J., & Anderson, D. (1988). Cognitive flexibility theory: Advanced knowledge acquisition in ill-structured domains. In *Proceedings of the Tenth Annual Conference of the Cognitive Science Society* (pp. 375–383). Hillsdale, NJ: Erlbaum.
- Spiro, R.J., & Jehng, J. (1990). Cognitive flexibility and hypertext: Theory and technology for the linear nonlinear and multidimensional traversal of complex subject matter. In D. Nix & R.J. Spiro (Eds.), *Cognition, education, and multimedia: Exploring ideas in high technology* (pp. 163–205). Hillsdale, NJ: Erlbaum.
- Spiro, R.J., Vispoel, W.P., Schmitz, J., Samarapungavan, A., & Boerger, A. (1987). Knowledge acquisition for application: Cognition flexibility and transfer in complex content domains. In B.K. Britton & S.M. Glynn (Eds.), *Executive control processes in reading* (pp. 177–200). Hillsdale, NJ: Erlbaum.
- Spivey, N.N. (1997). *The constructivist metaphor: Reading, writing, and the making of meaning*. San Diego, CA: Academic.
- Street, B.V. (2006). New literacies, new times: How do we describe and teach the forms of literacy knowledge, skills, and values people need for new times? In J. Hoffman, D.L. Schallert, C.M. Fairbanks, J. Worthy, & B. Maloch (Eds.), *55th yearbook of the National Reading Conference* (pp. 21–42). Oak Creek, WI: National Reading Conference.
- Taylor, I. (2008, December). *Modes as historically produced: Examining multimodality through a lens of critical black feminism*. Paper presented at the meeting of the National Reading Conference, Orlando, FL.
- Tierney, R.J. (2009). The agency and artistry of meaning makers within and across digital spaces. In S.E. Israel & G.G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 261–288). New York: Routledge.
- Tierney, R.J., Bond, E., & Bresler, J. (2006). Examining literate lives as students engage with multiple literacies. *Theory Into Practice*, 45(4), 359–367. doi:10.1207/s15430421tip4504_10
- Turkle, S. (1995). *Life on the screen: Identity in the age of the Internet*. New York: Touchstone.
- von Hippel, E., & von Krogh, G. (2003). Open source software and the “private collective” innovation model: Issues for organizational science. *Organization Science*, 14(2), 209–223. doi:10.1287/orsc.14.2.209.14992
- Witte, S.P. (1992). Context, text, intertext: Toward a constructivist semiotic of writing. *Written Communication*, 9(2), 237–308. doi:10.1177/0741088392009002003
- Wittgenstein, L. (1953). *Philosophical investigations*. Oxford, England: Blackwell.
- Zeleny, J. (2009, January 23). For a high-tech president, a hard-fought e-victory. *The New York Times*, p. A18. Retrieved January 24, 2009, from www.nytimes.com/2009/01/23/us/politics/23berry.html?_r=1

Rob Tierney is dean of the faculty of education and professor of language and literacy education at the University of British Columbia, Canada; e-mail rob.tierney@ubc.ca.