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A Review of the "Digital Turn" in the New Literacy Studies

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Digital communication has transformed literacy practices and assumed great importance in the functioning of workplace, recreational, and community contexts. This article reviews a decade of empirical work of the New Literacy Studies, identifying the shift toward research of digital literacy applications. The article engages with the central theoretical, methodological, and pragmatic challenges in the tradition of New Literacy Studies, while highlighting the distinctive trends in the digital strand. It identifies common patterns across new literacy practices through cross-comparisons of ethnographic research in digital media environments. It examines ways in which this research is taking into account power and pedagogy in normative contexts of literacy learning using the new media. Recommendations are given to strengthen the links between New Literacy Studies research and literacy curriculum, assessment, and accountability in the 21st century.
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This article reviews a decade of research specifically addressing sign-making practices using digital technologies, located within the New Literacy Studies. The digital strand within the New Literacy Studies follows a much longer tradition of sociocultural research that has contributed to current understandings of print-based literacy practices in everyday use by different communities (Barton, 1994; Fairclough, 1989, 1992; Gee, 1996; Heath, 1983, 1999; Kress, 1993; Lankshear, Gee, Knobel, & Searle, 1997; A. Luke & Freebody, 1997; Street, 1984, 1995, 1999, 2003).

This article synthesizes the current corpus of empirical studies of digital practices that are located within the New Literacy Studies. It addresses some of the central tensions in the field: the boundaries of "literacy," the relative merits of researching digital practices in informal versus formal learning sites, emerging features of digital practices globally, pedagogical concerns, the contributions of critical sociology, and the contention that the New Literacy Studies focuses on the digital practices of the dominant middle-class. Recommendations are made for furthering this tradition in digital contexts of use.

The most recent, significant shift in this field has been what could be called the "digital turn"—that is, the increased attention to new literacy practices in digital environments across a variety of social contexts, such as workplaces and educational,

economic, and recreational sites. The digital turn—a pun on Gee's (2000, p. 180) "social turn" in literacy research—is a consequence of globalization and the growing range of technologies for communication. Research in the New Literacy Studies has similarly reflected the changing emphasis from research of print-based reading and writing practices to include new textual practices that are mediated by digital technologies. The beginning of this shift was observed by Barton (2001) almost a decade ago, and this review of case studies shows a steady output of research in this important and changing field.

The data in this article were retrieved using major search engines in education (e.g., ERIC, Ebsco, Proquest Education, and Google Scholar). The search located peer-reviewed studies that explicitly acknowledged the influence of a sociocultural literacy approach. The following search was used, with modification of Boolean

operators for different platforms: (literacy Or reading Or writing) And (sociocultural Or social practice) And (digital Or techno* Or comput* Or multimedia). The timeframe of 1999–2009 was specified within the database search. These are the years in which the nexus between literacy and technology has become an important and recognized strand of literacy research. These data were combined with database and hand searches of books, literacy policies, and government reports. Ninety peer-reviewed journal articles were identified. Thirty-nine papers reported observational research. These studies follow principles of the New Literacy Studies, a term used by Gee (1996), Street (2003), and others since the late 1990s (see Barton & Hamilton, 1998; Street, 1999, 2003, 2005a).

New to Newer in the New Literacy Studies

Proponents of the New Literacy Studies regard literacy as a repertoire of changing practices for communicating purposefully in multiple social and cultural contexts. Knowledge and literacy practices are primarily seen as constructions of particular social groups, rather than attributed to individual cognition alone. For example, one of the earlier studies in the sociocultural literacy tradition was Street's (1984) ethnographic investigation of how commercial discourses were developed within an Iranian community. Street (1995, 1999) showed how literate practices carry meaning primarily through their entrenchment in specific cultural values and orientations. This paradigm became increasingly visible in literacy research and other academic fields from the late 1970s. This corresponded with a revival of the work of Vygotsky (1962), who saw language as influenced and constituted by social relations or sociogenesis. Language functions as a tool for shaping, controlling, and interacting with one's social and physical environment. This perspective took various forms in theories of learning since the 1980s, including situated cognition (Brown, Collins, & Duguid, 1989; Greeno, 1997; Lave, 1988), communities of practice and situated learning (Lave & Wenger, 1991; Wenger, McDermott, & Snyder, 2002), and the New Literacy Studies (see, e.g., Knobel & Lankshear, 2007; Lankshear & Knobel, 2003; Street, 2003).

Scholars within the New Literacy Studies have specifically drawn attention to the innovative and productive potentials of literacy practices in electronic environments that children use both in and out of school settings (Gee, 2003; Hull & Schultz, 2001; Lankshear & Knobel, 2003; Nixon, 2003; Sefton-Green, 2007; Street, 2003). There is recognition that interpreting and representing ideas and

information in social contexts, both inside and outside of schools, is increasingly digitalized. The emergence of hybrid digital forms, such as wikis, blogs, databases, and online news, call for new understandings of genre and textual features. New technical proficiencies with computers and other communication devices must be constantly learned for the rapid production, processing, and transmission of electronic texts.

The digital strand of the New Literacy Studies is largely comprised of ethnographies investigating a wide range of literacy practices, summarized here and later analyzed. Geographically, the work has been applied across a wide range of countries from the United States, Canada, Australia, and the United Kingdom to Rwanda (Mukama & Andersson, 2008), South Africa (Janks, 2000), and Greece (Mitsikopoulou, 2007).

The research sites include schools (Damico & Riddle, 2006; Morrell, 2002), out-of-school contexts (Ito et al., 2008; Yi, 2008), and afterschool settings (Barab, Thomas, Dodge, Carteaux, & Tuzun, 2005; Brass, 2008; Hull, 2003). Multisite studies also document the connections between literacy practices across home and school settings (Bulfin & North, 2007; Pahl, 2001).

Varied levels of schooling are addressed, from early childhood (Flewitt, Melanie, & Payler, 2009; Labbo, 1996; Marsh, 2000; Pahl, 2007) to elementary (Mills, 2007b) and high school (Knobel, Stone, & Warschauer, 2002; Leander, 2002). Institutional research contexts include higher education (C. Jacobs, 2005; O'Dowd, 2005), such as pre-service and in-service teacher university programs (Koskos, Boehlen, & Walker, 2000; Rowsell, Kosnik, & Beck, 2008).

Studies focus on the literacy practices of monolingual English users as well as

bilingual (Ernst-Slavit, 1997) and multilingual students (van Sluys, Fink, & Fisher, 2008) and those for whom English is a second language (Ajayi, 2009; Shun & Lam, 2000). The socioeconomic status (SES) of the participants are diverse, including working class (Marsh, 2003), middle-class (G. E. Jacobs, 2004), and urban students (Damico & Riddle, 2006; Knoester, 2009; Morrell, 2002). Textual practices frequently involve multimodal texts—that is, when words are used in combination with visual, audio, spatial, and gestural modes. For example, studies have examined popular culture (Clancy & Lowrie, 2002; Ranker, 2007), writing multimedia stories (Rojas-Drummond, Albarran, & Littleton, 2008), and reading talking books in Indigenous languages (Darcy & Auld, 2008).

Research of online literacy practices include instant messaging (G. E. Jacobs, 2004; Lee, 2007; Lewis & Fabos, 2000, 2005), designing Web pages in anime (Japanese animation) fan sites (Chandler-Olcott & Mahar, 2003), using Web quests, creating e-zines or electronic magazines (Courtland & Paddington, 2008), and writing online fanfictions (A. Black, 2009). Web 2.0 practices include relay writing using microblogging platforms (Yi, 2008), blogging (Davies & Merchant, 2007), threaded discussions (Grisham & Wolsey, 2006), and wikis (Wheeler & Wheeler, 2009).

A recent trend has seen research of digital media production, including movie making (Brass, 2008; Mills, 2008b; Ranker, 2008), interactive digital art (Peppler & Kafai, 2007), programming video games (Sanford & Maddil, 2006), and authoring and performing spoken word poetry (McGinnis, 2007). A distinguishing feature of this extant work is detailed accounts of digital practices using the encoded word in culturally specific locales.

What Counts as "Literacy Practice" in the Digital Turn?
A criticism of the New Literacy Studies, and one that its proponents have conceded is as yet unresolved, is the need for researchers to limit what counts as literacy (Barton, Hamilton, & Ivanic, 2000, p. 95). At the turn of this century, Barton (2001, p. 95) argued for a broad interpretation of what constitutes literacy and proffered that that the New Literacy Studies has "accepted more fuzzy borders" in order to demonstrate links and similarities that are not really separable. By way of example, he commented that "people read timetables, maps and music, as well as novels and academic articles" and "there is a great deal in common in the practices associated with these diverse texts" (Barton et al., 2000, p. 95).

Theorists of the New Literacy Studies are generally agreed that literacy is inclusive of sign-making practices that use various technologies. For example, Scribner and Cole (1981) define *literacies* as "socially organised practices [that] make use of a symbol system and a technology for producing and disseminating it" (p. 236). Expressed concisely by Street (2003, p. 79), literacy practices are "particular ways of thinking about and doing reading and writing in cultural contexts." Today, many cultural contexts of literacy practice involve digital technologies.

Gee (1996) uses the term *Discourses* (with a capital D) rather than *literacies*, which he defines as socially recognized ways of using words or other semiotic codes (e.g., images, sounds) and ways of "thinking, feeling, believing, valuing, and acting" to identify as a member of a "socially meaningful group" (p. 131). Explicitly drawing on this work, Lankshear and Knobel (2003) define *literacies* as "socially recognised" ways of communicating "through the medium of encoded texts . . . as members of discourses" (p. 4). They uniquely use the term *encoded texts* to refer to transportable texts that are rendered in a form to be retrieved, modified, and made available independently of the physical presence of another person. Encoded language is captured in a semipermanent or permanent form, as distinct from speech and gestures (Knobel & Lankshear, 2007).

Review of the empirical research in this tradition confirms that in virtually all

cases, the participants engage with written words in the process or product of their textual engagements, while frequently drawing on other modes and conventions. For example, Junquiera (2008) analyzed the multimodal textual practices of two groups of economically disadvantaged students from Brazilian public high schools. The texts produced by the students included original, digitally recorded song lyrics (Portuguese and English) published on the Web and a digitally presented comic strip containing written dialogue and images, stressing characteristics of a local rural dialect. In both cases, the mode of the written word played a significant role in conveying the meaning of the multimodal and digital texts.

Similarly, Hull and Nelson (2005) analyzed digital stories produced by urban youth in the DUSTY (Digital Underground Storytelling for Youth) afterschool technology center in California. They presented a multimodal semiotic analysis of Lyfe-N-Rhyme, a digital story with an implicit social critique. A sequence of evocative images was digitally mapped to original spoken-word poetry, backgrounded by a classic jazz composition. Across each of these literacy practices, as with many others (e.g., Ajayi, 2009; A. Black, 2009; Goodfellow & Lea, 2005), the encoded word carries a salient role in communicating meaning.

The difficulty of limiting what constitutes "literacies" in a changing communications environment is not unique to the New Literacy Studies. An overlapping and parallel international call for reconceptualizing literacy for the new times was issued by the New London Group in 1996. The term *multiliteracies* was coined by 10 prominent literacy educators, including authors who have published with theorists associated with the New Literacy Studies (e.g., Gee, 1992; Kress, 1993; A. Luke, 1992) to address two key arguments (New London Group, 1996, p. 61). The first was the need for new literacy pedagogy to account for the multiplicity of communications channels, media, and protocols, tied to the availability and convergence of new technologies (e.g., combining TV and Internet). Contemporary forms of communication require working with multimodal texts, which combine visual, audio, gestural, spatial, or linguistic modes to enrich, modify, and enliven meaning (Cope & Kalantzis, 2000; Kress, 2000b).

The second argument of multiliteracies was that literacy pedagogy should be transformed to respond to cultural and linguistic diversity as a consequence of migration and globally networked economies (New London Group, 1996). They contended that while society is becoming more globally connected, diversity within local contexts is also increasing. They observed that English is becoming a world language, yet it is breaking into multiple and increasingly differentiated Englishes, marked by accent, dialect, or subcultural differences tied to membership in professional, recreational, or peer groups. Involvement in community life requires that we interact effectively using communication patterns that cross cultural, subcultural, and national boundaries (Lo Bianco, 2000; New London Group, 2000). The key issue was not that cultural diversity is completely new but rather that literacy pedagogy needs to be more inclusive of cultural difference.

Theorists of the New Literacy Studies, multiliteracies, multimodal semiotics (cf., Jewitt & Kress, 2003; Kress, Jewitt, Ogborn, & Tsatsarelis, 2001), and others (e.g., Eco, 1976; Lapp, Flood, & Heath, 2004; Lemke, 1998) have argued that conventional views of reading and writing are no longer adequate to describe the combination of sign systems in digital texts. Reducing the English curriculum to a narrow repertoire of conventional genres and writing skills discounts the reality of literacy practices in society today, excluding new forms of digital text. The ease with which users of the new technologies can transmit, produce, and print documents for everyday purposes has made encoded language predominantly multimodal (Kress, 2000b; Kress & van Leeuwen, 1996).

Kress (2000b), who has co-authored work with members of the New Literacy Studies, has at times described language as a multimodal system of representation that is "fuzzy round the edges" (p. 186). However, Kress makes distinctions

between modes—that is, the full semiotically articulated means of representation and communication (Kress, 2000b, 2003; Kress et al., 2005). For example, Kress (2000a) distinguishes between written and spoken words, images, gestures, and music as particular forms of representation.

The increasing role of digital technologies for communication is one of the major reasons why theories of literacy and semiotics associated with the New Literacy Studies are taking into account meanings that exist in modes other than words on the page (Kress, 2003). There is no imprecision in broadening conventional understandings of literacy beyond print alone. Rather, it is a well-rationed effort not to exclude literacy practices that are augmented and modified by other modes in digital formats. Lemke (1998) argues that meanings in multimedia are not just words plus images. Rather, word meanings are modified in the context of image-meanings, and vice versa, opening up a wider range of meaning potential. Cope and Kalantzis (2000), of the New London Group, have called for the ongoing reformulation of a grammar to describe new textual forms, and there has been a global response (e.g., Jewitt, 2006; Jewitt & Kress, 2003; Kress et al., 2005; Pahl, 2007; Siegel, 2006; Stein, 2006). Linguists and academics have continued to develop new grammars for describing the confluence of words, images, sounds, gestures, and spatial elements across a range of text formats (e.g., Burn & Parker, 2003; Mills, 2009).

While the New London Group's broadened definition of *literacy* has been internationally well received by literacy academics, there have been several criticisms of this view (e.g., Cameron, 2000; Pennycook, 1996; Prain, 1997; Trimbur, 2001). In relation to the earliest formulation of the multiliteracies argument, Prain (1997) contended that extending linguistic grammars to also include another four modes—audio, visual, spatial, and gestural—generates an overwhelming range of new content and genres for English teaching and requires tools of semiotic analysis that were not yet developed. A criticism was that the semiotic boundaries of the New London Group's conception of multimodal texts were too blurred for the purposes of formulating English curricula and, at the time of writing, were not nuanced enough for classroom discussion with students (Mills, 2009).

In response to these concerns, Cope and Kalantzis (1997), of the New London Group, have defended that the multimodal quality of texts is a reality of our fastchanging, globalized textual environment. They demonstrated how new literacies build on established rules and conventions, possessing familiar elements that enable the formulation of analytic categories to describe them. These text forms also have new textual features, such as modified genres or text structures. For example, instant messaging is more brief, spontaneous, and interactive than other written texts. It is characterized by a responsive, spoken-like form that contains a combination of conventional spellings and new abbreviations that have become recognizable to frequent users of the discourse (Mills, 2009).

The New London Group invited linguists and scholars to develop new multimodal grammars to describe a broadened range of semiotic systems that figure so prominently in the new digital communications environment. A growing body of research in multimodal semiotics has articulated extended grammars to describe the visual, spatial, and other elements of texts that enrich, augment, and modify word meanings (e.g., Jewitt, 2006; Jewitt & Kress, 2003; Kress, 2000b; Pahl, 2003; Stein, 2006). The multiliteracies argument has moved the New Literacy Studies and literacy studies more broadly, to acknowledge the multimodal nature of meaning-making (Mills, 2009). There is a shared recognition that reading and writing practices using words on paper-based text formats are necessary, but not sufficient, for communicating across the multiple platforms of meaning-making in society (Kress, 2000b).

Textbook to FaceBook: In- and Out-of-School and Across Generations

Empirical research of the New Literacy Studies has frequently documented authentic

literacy practices that are situated in informal contexts of learning (Hull & Schultz, 2001; Street, 2003). Since the digital turn, research in this theoretical tradition has demonstrated how innovative and productive forms of learning can occur with digital media in peer- and interest-driven networks that are oriented toward social communication and recreation (e.g., Beavis, Nixon, & Atkinson, 2005; Ito et al., 2009; Ito et al., 2008; Kristien & Harmon, 2009; Sefton-Green, 2007). Many adolescents are engaging in "friendship-driven" practices to maintain and extend the social networks of those they deem important in their offline lives, such as using Facebook and MySpace (Ito et al., 2008, p. 1). Adolescents are also engaging in "interest-driven" networks where they connect with peers and adults, often beyond their local community, who have specialized interests, from online gaming to music and fan art (Ito et al., 2008, p. 1).

The features of interest-driven, online practices have been examined in studies of adolescents' use of digital technologies in communities of practice beyond academic settings. Studies by Chandler-Olcott and Mahar (2003) and R. Black (2007) and A. Black (2009) have highlighted the voluntary participation of teens in multimodal, online forms of communication inspired by anime fan art (Japanese animations), including Web page presentation, listserv contributions, online discussion groups, and e-mail. Similarly, Yi (2008) examined 22 adolescent Korean American students' self-selected writing composition in an online community. The research focused on relay writing, which is the online construction of a novel written in short sections and forwarded to multiple authors. Others have investigated youth engagement in E-zine (electronic magazine) and journal communities (Guzzetti & Gamboa, 2005), social networking via online chat (Shun & Lam, 2000), instant messaging (G. E. Jacobs, 2004; Lee, 2007; Lewis & Fabos, 2005), digital storytelling (Hull & Nelson, 2005), and video game play in virtual worlds (Barab et al., 2005).

While such research has provided important information about bona fide digital practices of youth, New Literacy scholars have urged researchers to forge investigations of the new literacies in institutional settings. At the turn of this century, Hull (2003), Street (2003), and other New Literacy scholars cautioned that an emphasis on learning in non-institutional settings needed to be tempered with the acknowledgement that the informal literacies of youth are not always rich, dynamic, and relevant to education. As Hull (2003) commented, literacy research needs to "celebrate youth culture clear-eyed, without romanticising it . . ." while enabling youth to "move well beyond the available stereotypes and formulas" (p. 233). Recognition of children's out-of-school literacies needs to be coupled with knowledge of the textual encounters that students still need to traverse (Hull & Schultz, 2001).

Indeed, a singular strength of the broader New Literacy Studies tradition is its stance against dismissing youth engagement with noninstitutional learning as merely frivolous, remedial, or inconsequential (Hull & Schultz, 2002). However, there is surprisingly little evidence of any resistance to official literacies in the digital strand of this tradition. The majority of studies reviewed here were conducted in formal contexts of learning, with an emphasis on reporting pedagogical recommendations to an audience of literacy educators. Theory-driven research has been conducted in digitalized afterschool programs in the effort to bridge digital literacies across informal and formal contexts, often linking universities to local communities.

An example of such work is the Digital Youth Network, a design-based research project that aims to develop the new media literacies of African American youth in the sixth to eighth grades. The project examines the conditions through which new media design projects lead to a diversification and enrichment of students' learning ecologies—the set of social contexts, including activities, relationships, and resources, that students access to structure learning across school, home, and community settings (e.g., Barron, 2004, 2006). This research is yielding successful models for supporting students as globally recognized designers, authors, and critics of the digital media in official and unofficial spaces of learning (Mercier,

Barron, & O'Conner, 2006). The participants were found to spontaneously transfer certain digital practices from school to home contexts, such as creating media products for family and friends. Evidence that the students were critically evaluating new media messages, as both consumers and producers, is echoed in an audio podcast produced by the students and published online: "I don't just play games—I'm responsible for the games I create" (Digital Youth Network, 2009).
Rather than locating digital practices as an in- and out-of-school dichotomy, recent large-scale empirical research—the Digital Youth Project by the MacArthur Foundation—has framed the discontinuities between practices in various sites as an "intergenerational struggle over literacy norms" (Ito et al., 2008).

The research investigated digital media and literacy practices across multiple populations and geographical and online sites, including schools. Given that the New Literacy Studies has been criticized for relying on small-scale research (Street, 2003, p. 83), it should be noted that this research drew upon over 5,000 hours of ethnographic field notes and 659 semistructured interviews. Online data included discussion thread transcripts; 400 videos; 10,000 online profiles from sites such as MySpace, Facebook, and Neopets; and a questionnaire completed by more than 400 participants (Ito et al., 2008).

The research examined the specific ways in which digital media are changing the way young people learn, play, socialize, and participate in civic life across multiple social contexts (Ito et al., 2008). Across the United States, basic access to digital production tools and the Internet was found to be a precondition for youth participation in popular networked publics. Social media play a vital role in sustaining peer culture, gradually replacing the role played by informal geographical meeting sites, such as malls, homes, or the street. In formal settings, the most powerful examples of digital literacy programs were based on learner rather than teacher interests. These programs afforded time for unstructured experimentation with new media, rather than emphasizing direct instruction from authority figures (Ito et al., 2008, p. 39).
Authoritative knowledge and the new literacies. A key finding of the Digital Youth Project, which has arisen in other studies, is the changed dynamic between youth and adult interpretations of what counts as authoritative knowledge (Ito et al., 2008, p. 11). Experienced peers or "co-conspirators," rather than traditional authority figures such as teachers, play an important role in establishing communal norms of the interest-driven media practices of youth. In these settings, youth have significant ownership of their self-presentation, learning, and evaluation of others (Ito et al., 2008). While adults sometimes participate with teens in online communities, conventional markers of status, such as age, are frequently altered (Ito et al., 2008). This finding aligns with Chavez and Soep (2005, p. 409), who identified a "pedagogy of collegiality" that characterizes successful adult-youth collaboration around the new media practices in programs (Ito et al., 2008, p. 39).

Other New Literacy Studies research highlights the destabilizing of traditional loci of authoritative knowledge and expertise and the centrality of peer collaboration, mentoring, and voluntary support to members of online communities. For example, Chandler-Olcott and Mahar (2003) describe how an adolescent engaged in self-directed learning in the process of constructing Web pages filled with fanfictions, applying and deepening her sophisticated technical knowledge of HTML.
Rather than seek assistance from teachers, Rhiannon received mentorship from two online peers. When she reached the limits of her technical knowledge, more experienced peers provided necessary HTML codes and links to websites.
Whether in the context of providing online gaming tips to newcomers in virtual worlds (Gee, 2003), constructing Web pages (Chandler-Olcott & Mahar, 2003), remixing anime (A. Black, 2009), adding entries to Wikipedia (Knobel & Lankshear, 2007, p. 18), or collaboratively writing a story (Yi, 2008), the New Literacy Studies has demonstrated a shift from traditional authority to an epistemology of shared knowledge and expertise. In online social sites, institutional authorities, such as parents and teachers, do not establish writing standards and protocols, nor are they positioned as instructional experts. Rather, norms and criteria

for participation are located in peer- and interest-based communities to gain new forms of social status and recognition (Ito et al., 2009).

Academic efficacy and the new literacies. Research in the New Literacy Studies tradition has begun to examine the relationship between academic efficacy and students' engagement in digital literacy practices. A series of studies were conducted to evaluate the outcomes of student engagement in Quest Atlantis, which employs a multiuser, virtual environment to immerse children in educational tasks. Drawing on sociocultural theories of learning, Quest Atlantis has hundreds of participants in elementary school classrooms and afterschool centers in the United States, Australia, Denmark, Singapore, and Malaysia. Participants (aged 9 to 12) travel through the virtual world of Atlantis. Players have to perform educational activities, communicate with other users and mentors, and build virtual personae.

The project uses a socially responsive design, which involves building sociotechnical structures that aim to guide learning across academic disciplines of knowledge in digital environments (Barab et al., 2005). Elementary students who engaged in this virtual world showed significant learning over time in substantive content areas of science and social studies, displaying a greater level of academic efficacy across multiple domains of knowledge (Barab, Dodge, Jackson, & Arici, 2003). Significant learning and motivational gains for students have been documented when new digital media are integrated into official literacy curricula. Educational initiatives have aimed to reduce the disconnections between students' experiences, identities, values, and patterns of engagement with new media across social spaces (Bulfin & North, 2007). For example, there are reports of schools adapting literacy curricula to successfully make stronger connections with the local and popular literacies of youth in recreational contexts, including computer gaming (Beavis, 2004), online chat (Goodfellow, 2004), digital presentations of spoken word poetry (Fisher, 2005; Jocson, 2005), and hip hop (Kirkland, 2006). Others have researched ways in which threaded discussion groups can be used with positive outcomes for writing in the literacy classroom (Grisham & Wolsey, 2006). In each of these cases, learners were better positioned to draw on their existing technical, social, and cultural skills than conventional literacy curricula allow.

Digital media arts and community-linked digital production programs have particularly aimed to enhance technological capacities and engagement among students from lower socioeconomic backgrounds (Resnick, Rusk, & Cooke, 1998; Warschauer, Knobel, & Stone, 2004). These programs build on students' existing cultural resources using digital and popular media, accomplishing both conventional and innovative curricular goals. The strength of such approaches is a recognition of students' varied backgrounds, effectively positioning students' out-of-school literacies as relevant tools for learning (Brass, 2008).

Common Patterns of Literacy Practice Across Local Contexts

Collins and Blot (2002, pp. 7–8) have argued that the New Literacy Studies demonstrate the plurality and context-specific nature of the new literacies but have yet to account for common patterns of literacy practice that hold across diverse case studies. Similarly, Brandt and Clinton (2002, p. 337) have critiqued the "limits of the local" apparent in much of the New Literacy Studies. They contend that the New Literacy Studies should work toward identifying some of the supposed autonomous features of literacy practices, but without necessarily upholding a skills-based approach to universal literacy standards. They recommend that the New Literacy Studies acknowledge the extent to which local literacy practices and the emic or insider perspectives of participants are influenced by external social factors beyond the community. The New Literacy Studies has worked against a universalist view of literacy—that is, the notion that literacy is an ideologically benign set of context-free skills that can be taught without regarding children's background experiences and prior cultural knowledge (Street, 1999). The theoretical endpoint of this view is to resist efforts to formalize or solidify the components of practice as universal standards. However, the empirical studies of the New Literacy Studies have, from the beginning,

used comparative research designs to examine both similar and unique features of literacy practices across informal and formal social sites (e.g., Heath, 1983; Street, 1997). Within the digital strand of the New Literacy Studies, a number of studies have adopted multisite research design to yield comparative data (e.g., Ito et al., 2008; Knobel et al., 2002). For example, the Digital Youth Project was conducted for the explicit purpose of examining how new media practices across different populations are embedded in a broader social and cultural ecology within the United States (Ito et al., 2008).

While comparative data are difficult to obtain within single-site case studies, the increasing corpus of ethnographies and other qualitative research within the New Literacy Studies is sufficiently large for patterns to be identified across communities and countries. Many of the New Literacy Studies draw attention to features of the local literacies that hold across varied sites. For example, in the studies reviewed here, 49 journal articles made reference to the multimodal nature of the new literacies. From a synthesis of the emerging patterns of literacy observed across multiple local sites, the following list of features is evident: The literacies are digital, pluralized, hybridized, intertextual, immediate, spontaneous, abbreviated, informal, collaborative, productive, interactive, hyperlinked, dialogic (between author and reader), and linguistically diverse (e.g., Bull et al., 2008; Knobel & Lankshear, 2009; Lee, 2002; Mills, 2008a).

Hybridization of textual practices. A salient feature of the new literacies is what can be referred to as the "hybridization" of textual practices—that is, the blending and modification of literate practices of a culture that results in the emergence of new text forms. An example of hybridization is relay writing—online story writing created by multiple participants (Yi, 2008). This has evolved as an innovative use of microblogging, involving short online exchanges of typically 140 characters or less. The textual practice of relay writing is in distinction to the usual use of microblogging to post monological status updates of daily minutiae.

The hybridization of literacy practices using digital tools occurs organically, typically in "voluntary spaces of participation," where users are not required to reproduce historically reified textual conventions (e.g., Hull & Schultz, 2001; Ito et al., 2008). For example, A. Black (2009) showed how adolescent females who contributed to online fanfiction sites used text creatively. Rather than emulating preexisting genres and concretized social patterns, they employed language and other symbolic resources to experiment with new genres and modify text forms. Chandler-Olcott and Mahar (2003) similarly showed how adolescents designed online fanfiction sites that utilized various Internet functionalities and blended features of multiple literary genres, including fantasy, science fiction, and romance, in novel ways.

The hybridization of literacy practices can also be illustrated in cross-language comparisons of instant messaging practices. Lee (2007) examined factors influencing script and language choice in CMC (computer-mediated communication) among multilingual Cantonese users of online text, drawing from a 70,000-word corpus of e-mail and instant messaging texts from youth in Hong Kong. New textual practices included Cantonese-based shortenings, common grammatical "errors" such as inappropriate verb forms and lexical choice, and creative orthographic representations of Cantonese. These patterns of spontaneous hybridization of grammar, vocabulary, and orthography have similarly been identified among English users of online instant messaging (G. E. Jacobs, 2004; Lewis & Fabos, 2005).

These examples from the New Literacy Studies demonstrate how youth are involuntarily developing hybrid genres, textual features, vocabulary, and practices that are tied to original purposes for engaging in new literacies using digital media. These studies have demonstrated that people in various cultures and subcultures reinvent and modify literacy practices with digital technologies for different social

purposes and parameters in specific ways that are often unforeseen by their designers (A. Luke, 2008).

Creative production of digital media. A second feature of the new literacies is a cultural shift from consumption of new media to creative production of the same (Buckingham, 2007). Evidence for this is seen in much of the New Literacy Studies research. For example, creative production of new digital media is a focus of the Computer Clubhouse in South Central Los Angeles (Peppler & Kafai, 2007). During its first 2 years of operation, the Clubhouse attracted more than 1,000 children and youth, with 98% coming from underserved communities. The inner-city youth became creators rather than consumers of digital products, using leading-edge software to create artwork, animations, simulations, multimedia presentations, virtual worlds, musical creations, websites, and robotic constructions (Resnick et al., 1998). Analyzing samples of these textual products, Peppler and Kafai (2007) demonstrate that education can provide young people with more sophisticated and robust creative production technologies than the basic tools that would otherwise be available to them.

Examining the collaborative production of multimedia texts among fourth grade children (age 9–10), Rojas-Drummond, Albarran, and Littleton (2008) provided detailed evidence of significant student learning. They applied microgenetic analysis to interactions between the learners and the way in which digital artifacts were taken up by the students. The students appropriated collaborative creativity, intertextuality (making cross-references between texts and modes), and intercontextuality (making logical connections between events in a text) in the process of producing their multimedia stories. Combining oracy, writing, and images using digital technologies, the students successful engaged in the co-construction of knowledge through digital media production.

These are examples of an emergent emphasis in the New Literacy Studies on the role of youth as the next generation of creators of multimodal content, including the critical design of texts, software programs, media images, discussions, and other media objects. The new literacies involve making and remaking media rather than being made by them.

Collaboration among members of online communities. Empirical research by the New Literacy Studies has drawn attention to the collaborative nature of digital practices—that is, engagement in joint activity centered on shared interests or knowledge domains. This has been facilitated by the rise of Web 2.0, also known as the "social web" (Wheeler & Wheeler, 2009, p. 1). New online tools have facilitated the collaboratively generated, interactive production of content (e.g., blogs, wikis, and social networking sites) over conventional Web 1.0 practices, which emphasized individual publishing and consumption (e.g., "read-only" Web content).

New Literacy Studies scholars have demonstrated how Web 2.0 tools also leverage "distributed intelligence," including fewer "expert-dominated" or "authorcentric" practices than conventional forms of writing (Knobel & Lankshear, 2007, p. 9). Wheeler and Wheeler (2009), for example, have demonstrated the benefits of engaging pre-service teachers in wikis, which are collaborative Web spaces to which all users can contribute text, images, and hyperlinks and modify text (Wheeler, Yeomans, & Wheeler, 2008). Participation in the wiki resulted in an improved quality of academic writing, which was tied to consciousness of having a wide, online audience (Wheeler & Wheeler, 2009).

Exposing the challenges of collaborative online writing in a university context, Goodfellow and Lea (2005) investigated new ways of assessing these new literacies in higher education. The shift from standardized assessments and conventional notions of individual authorship to collaborative assessment measures created conflicting expectations and complexities among students and instructors.

Specific recommendations were made for supporting students, particularly culturally diverse groups, to engage in new genres and forms of online assessment in collaborative contexts of learning.

Other empirical research of the New Literacy Studies has examined the collaborative, social, and productive nature of social media in both school and informal settings, through the production of e-zines (Courtland & Paddington, 2008), social networking (Horst, 2009; Pascoe, 2009b), photo sharing (Martínez, 2009), digital media in dating and courtship (Boyd, 2009; Pascoe, 2009a), and wikis in high schools (Grant, 2006). These studies demonstrate how joint participation in online community practices facilitates the co-construction of knowledge.

Confirming sociocultural research in offline contexts, students progress from legitimate peripheral participation to gradually assuming a more central role as actors and competent participants in communities of practice (Lave & Wenger, 1991). Gee (2004, p. 84) refers to this engagement in joint activity as "affinity spaces"—the sharing of knowledge and expertise based on voluntary affiliation around a common interest or goal. Gee observed that many online and offline resources support this collaboration. The empirical studies reviewed here have examined the nuances of these collaborative practices in both institutional and noninstitutional learning sites. Extending beyond the "limits of the local" (e.g., Collins & Blot, 2002), the New Literacy Studies have generated new knowledge about recent global shifts toward user-generated, collaborative, democratic, and interactive forms of online participation.

Pedagogy and Power Relations in the "Digital Turn"

Although issues of power and pedagogies have not always been addressed within the New Literacy Studies (cf., Barton, 2001), there is now a growing corpus of research that applies key themes of critical theory to studies of digital practices (e.g., Hawkins, 2004; Mukama & Andersson, 2008; Pahl, 2007; Rowsell et al., 2008; Stein, 2007). New Literacy scholars, such as A. Luke (1998) and Street (1999), have argued that all literacy practices are ideological and therefore must be interpreted in relation to larger social contexts and power relations. Applying these principles to the research of new literacy practices both within and across communities has yielded significant evidence of patterns of marginalization that are socially and historically constituted.

Regarding pedagogy, a widespread movement that has influenced New Literacy Studies is the multiliteracies pedagogy of the New London Group (cf., New London Group, 1996, 2000). Scholars in both groups draw from sociocultural principles of literacy learning, at times co-authoring research. An explicit aim of the New London Group was to develop theory that is "of direct use in educational practice" (New London Group, 1996, p. 89). The New London Group provided a conceptual framework for literacy pedagogy that has four related components—situated practice, overt instruction, critical framing, and transformed practice (see New London Group, 1996). This model has lead to international uptake, from Australia (Lewis & Fabos, 2000) to South Africa (Newfield & Stein, 2000) to the Torres Strait (Osbourne & Wilson, 2003) and beyond (O'Brien, 2001). The New London Group envisaged that a multiliteracies pedagogy might provide "access without children erasing different subjectivities"—one that is "genuinely fair in the distribution of opportunity" (New London Group, 2000, p. 18).

Observing the ideological nature of literacy practices and their distribution in an upper primary classroom, Mills (2008b) described a teacher's enactment of the multiliteracies pedagogy across a series of print and digital media lessons. Students' access to digital media production in the classroom was unequal because of interactions between the teacher's pedagogies, coercive power, and the official discourses of the classroom. Students from Anglo-Australian, middle-class backgrounds had greater access to multimodal and digital literacies than those who were culturally or economically marginalized. Irrespective of the relative merits of

the multiliteracies pedagogy over conventional approaches, its ability to provide equitable access was tied to power relations in the school that constrained and enabled its implementation (Mills, 2009).

Tracing patterns of power and access to new literacies, research has demonstrated that socioeconomic marginalization is tied to a reduced quality of access to digital practices in the home. Snyder, Angus, and Sutherland-Smith (2002) described a multisite study that investigated the digital practices of four families at home and school who had varied social and economic resources. While all four families appropriated the technology into existing family literacy practices, the precise social purposes, nature, and quality of these literacies differed significantly, affording varying levels of economic power to the participants.

For example, the most economically disadvantaged family had one shared computer, which became a source of entertainment, such as constant instant messaging, gaming, and downloading music. In contrast, the members in wealthier families had exclusive use of their own computers or laptops, which they used for work, information gathering, and organizing social aspects of their lives. The varying quality and nature of digital practices was mediated by differing cultural resources in the families' homes (Snyder et al., 2002). Other research confirms that even when youth have access to digital production technology at home, they rarely apply digital tools to creative media production unless socialized into these practices (Buckingham, 2007).

Others have examined how the local digital practices of youth in their informal spaces are implicated in wider patterns of power and marginalization. A case study of adolescent males' engagement in video games in noninstitutional settings highlighted the way in which gaming provides space to resist institutional authority and feminized spaces, while reinforcing hegemonic depictions of masculinity (Sanford & Maddil, 2006). The study demonstrated that video games can be a powerful learning tool for the transfer of knowledge, intertextuality, and text design. However, little evidence was found that the video game players were engaging in social or moral critique of the cultural stereotypes. They lacked older mentors to guide conscious and responsible resistance to dominant masculinities.
The New Literacy Studies has examined how students can be taught to question and challenge implicit and explicit social messages of the new media. For example, Beach and Myers (2001, p. 180) examined the use of new media, and in particular the juxtaposition of images, text, and audio, to teach students how to critique authors' assumptions about the world. This research positioned the out-of-school literacies of youth as an important focus of attention, demonstrating how youth construct their identities within the larger context of a virtual media world, as well as within the more readily acknowledged context of their immediate, local subcultures (Beach, 2000, p. 13).

Applying critical media research to early childhood educational contexts, Crafton, Brennan, and Silvers (2007) described how students in a Grade 1 class engaged in the critical reading of texts and constructed multimodal texts using computers to publically voice concerns about issues in the local community. The technologies and texts in the classroom were initially used by the teacher to reproduce existing pedagogies. Through engagement in a supportive professional community, the teacher made instructional decisions that drew on new technologies and media for sophisticated forms of collaboration, social inquiry, problem solving, and critical literacy.

Domico (2006) described a similar critical media project for fifth grade students called Exploring Freedom. The students were guided toward analyzing and evaluating multimedia sources (websites, books, magazines, and newspapers), and the multimedia texts produced included research reports, news broadcasts, editorials, films, dances, and poetry. It demonstrated how an inquiry-based, critical media approach could be taught to take affirmative action against racial prejudice and

other social issues involving unequal power relations.

Diffusing the power differential between researchers and the subjects of their research, the Parent Project involved multilingual eighth graders in serving as coinvestigators (van Sluys et al., 2008). They recorded data about their parents' engagement in weekly focus groups about multilingualism, digital practices, and critical literacy. The study highlighted the positive outcomes for a bilingual community when linguistic diversity, particularly the freedom to code switch between English and one's first language, became a resource for collaborative inquiry.
The influence of critical sociology on the New Literacy Studies has yielded important findings about power relations and new digital practices across all levels of education, from early childhood to adult education. These studies have demonstrated the constraining and enabling powers at work when new digital practices are integrated in normative (school-sanctioned) and informal contexts of literacy learning. Likewise, these studies have demonstrated the specific ways in which social patterns of marginalization are reproduced and resisted in the appropriation of digital practices across institutional, private, civic, and recreational sites.

"Exotic" New Literacies in Dominant Western Contexts
A criticism by Walton (2007, p. 197), Todd (2008), and Prinsloo and Snyder (2005) is a tendency of the New Literacy Studies, and recent literacy studies more broadly, to focus on the practices of young people in predominantly middleclass family backgrounds in well-resourced countries. For example, Walton (2007, p. 197), writing from South Africa, argues that digital literacies, such as online chat, blogs, wikis, digital media production, games, and podcasting, are "exotic practices" for the "majority of the world . . . sustained by resources and leisure that are simply not available to most people."

Similarly, Prinsloo and Synder (2005) contrast their study of young people's use of information and communication technologies in Uganda against existing work in middle-class locales around the globe. While researchers of new literacies have argued that children's literacy activities involving computers outside of school are typically more frequent, sophisticated, and more meaningful than those they encounter in school (Bigum & Green, 1993; Gee, 2003; C. Luke, 2000; Reinking, McKenna, Labbo, & Kieffer, 1998), they argue that this is not the case in their Ugandan context. Prinsloo and Synder (2005) acknowledge that digital learning opportunities in out-of-school contexts can be created with positive outcomes for students from less advantaged neighborhoods (Hull & Schultz, 2002; O'Hear & Sefton-Green, 2004). However, they recognized that physical access to computers in the home settings of young people from minority cultures has not necessarily translated into success with computers for these students in school contexts (Angus, Snyder, & Sutherland-Smith, 2004).

The generalization that literacy research has focused on the new and exotic literacies of the dominant middle-class in Western cultures requires examination. The empirical research generated by the New Literacy Studies is largely comprised of many small-scale ethnographic case studies around the world. For instance, empirical studies have examined new literacies of marginalized communities, including teachers and students, from countries such as Brazil (Junquiera, 2008), South Africa (C. Jacobs, 2005; Walton, 2007), Greece (Mitsikopoulou, 2007), Hong Kong (Lee, 2007), Rwanda (Mukama & Andersson, 2008), Spain (O'Dowd, 2005), and Korea (Ajayi, 2009). The range of countries and social contexts of inquiry, and the varied patterns of participant selection in these case studies, demonstrates that the New Literacy Studies has, in fact, contributed more to understandings about social practices in marginalized communities than in dominant or mainstream cultural contexts.

In the current work in the New Literacy Studies, there are relatively few case studies of informal, digitally rich literacies of middle-class youth (e.g., G. E. Jacobs, 2004). A greater number of studies in the United States, Canada, the United

Kingdom, and Australia have examined the successful integration of digital practices among literacy programs for multilingual, bilingual, and low socioeconomic communities. The minority cultures represented in these studies include the following: Latino, African American, and multiethnic (Damico & Riddle, 2006; Ernst-Slavit, 1997; Hull, 2003; van Sluys et al., 2008); Cantonese (Siu, Lam, & Seung, 2005); Indigenous Australian, Thai, Tongan, Maori, and Sudanese (Mills, 2008b); Filipino and Taiwanese (A. Black, 2009); Chinese (A. Black, 2005; Shun & Lam, 2000); Mexican, Cambodian, Nicaraguan, and South American (El Salvador) (Ajayi, 2009; McGuinnis, 2007); Indigenous Mexican groups (Lopez-Gopar, 2007); and minority Chinese (Hmong) (Hawkins, 2004). These studies consistently show that broadening literacy curricula to include multimodal and digital forms of representation results in significant English language learning gains for multilingual students.

For example, Ajayi (2009) described the benefits of using multimodal textual practices to engage ESL (English as Second Language) students in critically analyzing media advertisements in a bilingual classroom. In a similar vein, McGuinnis (2007) reported an inquiry-based, multimodal literacy project for adolescents in a summer migrant educational program. These ESL migrants had recently arrived in the United States from rural areas of China, Vietnam, and Cambodia (ethnic Khmer). Both studies illustrated that encouraging ESL students to draw on their interests, cultural experiences, first language, and multiple modes (e.g., visual, spatial) can promote their academic success.

These studies have demonstrated how students from culturally and linguistically diverse backgrounds can engage productively in multimodal, digital, abbreviated, and spontaneous literacy practices in both institutional and noninstitutional spaces. They also serve to defend the New Literacy Studies against a bias in participant or site selection, since these studies extend beyond dominant cultural contexts.

There is similarly little evidence that the New Literacy Studies has given preference to the digital literacy practices of the middle-class. While some studies do not comment on socioeconomic backgrounds of the research participants, other studies explicitly focus on the digital literacy practices of economically marginalized students. Schools with socioeconomically marginalized clientele confront particular system constraints and routine practices that militate against the effective integration of digital tools in literacy curriculum (Mills, 2007a).

For example, a comparative literacy and technology equity study conducted across eight high schools in California, five of them located in underserved communities (almost 50% Hispanic), was described by Knobel et al. (2002). The study investigated whether there was a digital divide that separates technology access and use in low SES and high SES schools. The study showed that there was not a single digital divide but rather a complex set of divides along overlapping lines, such as gender, geographical location, socioeconomic background, and ethnicity (Knobel et al., 2002).

Clichés such as the “global village” have pervaded discourse in the wider literature about technology in education (e.g., Gore, 1991, p. 150; McLuhan & Powers, 1989, p. 1). While online forms of communication are becoming globalized, the New Literacy Studies has demonstrated how access to digital literacies is continually increasing but is still unevenly distributed across communities. There are qualitative differences in the kinds of online practices of users that are patterned by ethnicity, English language learning, socioeconomic background, learning difficulties, geography, and coexisting categories of marginalization (e.g., urban poor). While giving acknowledgment to the significant advances in digital communication technologies, there is not a single global village—rather, there are groups with varied levels of participation in digital practices across local villages around the world.

Research Recommendations for the New Literacy Studies

The New Literacy Studies has investigated a broadened range of digital literacy practices across multiple technologies, media, modes, text formats, and social contexts. This work has highlighted specific ways in which innovative digital practices are significantly more complex and varied than traditional literacy curricula and externally imposed standardized assessments currently permit (Street, 2005b). Consequently, many features of new literacy practices remain "untapped" by standardized literacy tests: self-monitoring online reading, collaborative online writing, digital media production, critical media literacy, and hybridization of textual practices (A. Luke, 2008).

Conventional literacy performance indicators such as print-based examinations cannot be taken as "proxies for effective digitalised pedagogy," neither can they capture the unintended cognitive and social "collateral achievements" of digital practices (A. Luke, 2008, p. 9). More importantly, they lack "life validity," since they do not reflect the authentic digital literacy practices in social contexts beyond schools. There is scope for the New Literacy Studies to reform conventional measures of literacy by generating, implementing, refining, and disseminating innovative models of digital and multimodal literacy assessments for the new times.

There is potential for the New Literacy Studies to identify factors that impinge on achieving specific pedagogical goals for digital literacy practices by applying qualitative, quantitative, and mixed-methods research that extends beyond single and multisite ethnographies. Sustainable research interventions are needed in institutional sites to investigate the change processes by which technologies become integrated with literacy curricula and to develop new models of curriculum and assessment (Labbo & Reinking, 1999). For example, design experiments (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003), formative experiments (Neuman, 1990; Reinking & Pickle, 1993), and situated evaluation (Bruce & Rubin, 1993) are approaches to research that have directly informed policy and practice in authentic educational contexts. Such approaches can account for how designs function, such as literacy interventions in educational sites, and have received the research funding support of governments (The Design Based Research Collective, 2003).

The New Literacy Studies engenders new visions for educational research, practice, assessment, and policy that take into account the transformed nature of the new literacies in the 21st century. Such research can continue to address the normative concerns of those who have a responsibility for guiding state and national accountability measures, using nomenclature that brings formerly polarized fields into a productive international dialogue.

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