Review of Research in Education

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Chapter 7

Multimodality and Literacy in School Classrooms

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The characteristics of contemporary societies are increasingly theorized as global, fluid (Bauman, 1998), and networked (Castells, 2001). These conditions underpin the emerging knowledge economy as it is shaped by the societal and technological forces of late capitalism. These shifts and developments have significantly affected the communicational landscape of the 21st century. A key aspect of this is the reconfiguration of the representational and communicational resources of image, action, sound, and so on in new multimodal ensembles. The terrain of communication is changing in profound ways and extends to schools and ubiquitous elements of everyday life, even if these changes are occurring to different degrees and at uneven rates (A. Luke & Carrington, 2002). It is against this backdrop that this critical review explores school multimodality and literacy and asks what these changes mean for being literate in this new landscape of the 21st century. The two key arguments here are that it is not possible to think about literacy solely as a linguistic accomplishment and that the time for the habitual conjunction of language, print literacy, and learning is over. As Kress (2003) writes,

It is no longer possible to think about literacy in isolation from a vast array of social, technological and economic factors. Two distinct yet related factors deserve to be particularly highlighted. These are, on the one hand, the broad move from the now centuries long dominance of writing to the new dominance of the image and, on the other hand, the move from the dominance of the medium of the book to the dominance of the medium of the screen. These two together are producing a revolution in the uses and effects of literacy and of associated means for representing and communicating at every level and in every domain. (p. 1)

My claim here is that how knowledge is represented, as well as the mode and media chosen, is a crucial aspect of knowledge construction, making the form of representation integral to meaning and learning more generally. That is, the ways in which something is represented shape both *what* is to be learned, that is, the curriculum content, and *how* it is to be learned. It follows, then, that to better understand learning and teaching in the multimodal environment of the contemporary classroom, it is essential to explore the

ways in which representations in all modes feature in the classroom. The focus here, then, is on multimodality on the representations and the learning potentials of teaching materials and the ways in which teachers and students activate these through their interaction in the classroom.

This review, organized in three parts, does not provide an exhaustive overview of multimodal literacies in and beyond classrooms. Instead, it sets out to highlight key definitions in an expanded approach to new literacies, then to link these to emergent studies of schooling and classroom practice. The first part outlines the new conditions for literacy and the ways in which this is conceptualized in the current research literature. In particular, it introduces three perspectives: New Literacies Studies, multiliteracies, and multimodality. Contemporary conceptualizations of literacy in the school classroom are explored in the second part of the chapter. This discussion is organized around themes that are central to multimodality and multiliteracies. These include multimodal perspectives on pedagogy, design, decisions about connecting with the literacy worlds of students, and the ways in which representations shape curriculum knowledge and learning. Each of these themes is discussed in turn, drawing on a range of examples of multimodal research. The third and final part of the chapter discusses future directions for multiple literacies, curriculum policy, and schooling.

My focus here is primarily on the school classroom as a site of literacy and learning. Discussion of out-of-school literacies, in particular, how technologies are remaking the boundaries between sites such as home and school, is an intensive focus of current work (Lam, 2006; Lankshear, Peters, & Knobel, 2002; Leander, 2001, 2007; Marsh, 2003; Pahl, 1999; Sefton-Green, 2006). This work demonstrates how learning traverses institutional boundaries, seeping across and at times collapsing the boundaries between in-school and out-of-school literacies (Leander, 2001). Indeed, the trajectories of students, teachers, and knowledge across and between these spaces are not only physical, but they are also social, emotional, and cognitive (Nespor, 1994). Sefton-Green's (2006) *Review of Research in Education* review of how current media debates frame children's interactions with media as pedagogic argues that interest in children's media culture opens wider notions of learning beyond education and school systems. In that same volume, Lam (2006) examines how learning and teaching take place in new digital landscapes and other translocal contexts as a way of understanding the opportunities and challenges of the contemporary era. Both pieces argue that the contemporary conditions of communication and digital technologies create the movement of images and ideas across geographical and social spaces in ways that affect how young people learn and interact.

I begin by focusing on the new conditions of literacy and how these have affected contemporary conceptualizations of literacy and learning. Key terms and ideas associated with multiliteracies and multimodality are introduced and outlined to provide a theoretical backdrop and context to the discussion of multiple literacies.

NEW CONDITIONS AND CONCEPTUALIZATIONS FOR LITERACY

The concept of multiple literacies has emerged in response to the theorizations of the new conditions of contemporary society. This can be broadly characterized by

a number of factors, including the accelerated transnational flows of people as well as information, ideology, and materials in contexts in which knowledge is highly situated, rapidly changing, and more diverse than ever before (Appadurai, 1990; Kalantzis, Cope, & Harvey, 2003). Alongside this, the representational and communicational environment is also changing in highly significant ways that can be described as a shift from print as the primary medium of dissemination toward digital media (Boulter, 1999; Kress, 2003). Against this backdrop, writing as the dominant mode is increasingly brought into new textual relationships with, or even exchanged for, visual and multimodal forms of representation (Bachmair, 2006). In consequence, new relationships between production and dissemination are made possible across a range of media and technologies, remaking the conditions and functions of authorship and audience (Adkins, 2005; Lury, 1993). In scientific endeavor, new digitalized workplaces, and new culture industries, disciplinary boundaries and expertise are increasingly blurred, reformulated, or collapsed in ways that open up new configurations and types of texts.

The potential impact of new social and material conditions on communication and education is profound. They allow for new possibilities and constraints for representation and communication. They also place emergent demands on the communicative repertoires of people to participate in the global economy as well as on the construction of knowledge and the performativity of self in face-to-face, local, and virtual contexts (Bauman, 1998; Beck, 1992; Butler, 1990; Leander & Wells Rowe, 2006). Hence, multimodal representation and globalization are close companions, providing new foundations for processes of remixing and remaking genres and modal resources in ways that produce new forms of global and commercial processes. These in turn are constantly personalized, appropriated, and remade in local workplaces, communities, and institutions.

These multimodal processes and their global scale and impact on local situated literacies are exemplified by a recent ethnographic study on the ascendancy of the Nike Swoosh as a global cultural icon. Bick and Chiper (2007) examined how the Nike Swoosh performs in the cultural contexts of two cities in Romania and Haiti, cities and countries that sit on the fringes of global capitalism. The Nike global trademark has been appropriated, transformed, and remade locally in Romania and Haiti in ways that express people's identities across numerous places—from logos on jackets and trucks to inscriptions on tombstones. This process of remaking happens across different scales and sites. Pahl's (2003) U.K. ethnographic study of three 5- to 7-year-old boys examines how meanings are constructed in multimodal texts made in the home. She demonstrates how young children consume and appropriate Pokemon and Yugio characters across television, film, and game cards, making and remaking features in their own cards and activities. Buckingham and Sefton-Green's (2004) study of Pokemon shows how theories of learning and multimodal meaning making can be applied to the relationship between media and user.

These studies suggest that the conditions for available resources and designs are dynamic, with distributed tools for transforming and (re)distributing these resources and designs in development and transition (Leander, 2007). Taken together, this work

highlights the changing requirements of communication, literacy, and knowledge economy of the 21st century. The implications for the educational system differ significantly from those of the nation-bound industrial economies of the recent past, with the industrial–print nexus continuing to dominate literacy policy and practice in schools (Gee, 2004; Gee, Hull, & Lankshear, 1996; A. Luke & Woods, in press). Against this changing communicational landscape, which can be typified by diversity and plurality, the dominant view of literacy as a universal, autonomous, and monolithic entity is at best dated and in need of reconsideration.

Literacy to Literacies

Literacy is increasingly pluralized and multiplied in educational discourses. It is, however, important to note that literacy studies has a long history of attending to the visual character of some scripts and symbol systems. Furthermore, the fields of New Literacies Studies (hereafter, NLS), multiliteracies, and multimodality each build on a range of traditions, disciplines, and histories. These include critical literacy and discourse studies (Fairclough, 1992; Foucault, 1980; Lankshear & McLaren, 1993; A. Luke, 1996; Street, 1995), genre studies based on systemic functional linguistics (Cope & Kalantzis, 1993; Freedman & Medway, 1994a, 1994b), gender studies (Cranny-Francis, 1993), and critical cultural studies (Hall, 1997).

Nonetheless, within this broader picture, NLS has been central in the theorization of the complexity of literacies as historically, socially, and culturally situated practice (Barton, Hamilton, & Ivanic, 2000; Street, 1998). Key to this attempt to rethink literacy is the analytical focus of NLS on literacy events and literacy practices with texts in people's everyday lives and the bid to document emergent literacies across different local contexts. This marks a shift in focus from the idea of literacy as an autonomous neutral set of skills or competencies that people acquire through schooling and can deploy universally to a view of literacies as local and situated. This shift underlines the variable ideological character of school literacy practices, that is, how the official institutional construction of literacy may or may not dovetail with emergent practices in homes and communities. Furthermore, this perspective enables an analysis of how the social practices of literacy in schools realize social structures through the formation of specific power relations, forms of knowledge, and identities (A. Luke & Carrington, 2002).

Within NLS, there is increasing recognition of the complex interaction between local and global literacies (Brant & Clinton, 2006). For example, Marsh's (2003, 2005) ethnographic studies on new technologies and the literacy practices of nursery school children (ages 2.5 to 4 years) describe how global discourses of Disney mediate children's everyday literacy practices. Marsh mapped children's mediascapes and patterns in media use through interviews, literacy diaries during a month period, questionnaires, and home observation with 62 families. She concludes that global media has a fundamental role in very young children's identity formation and construction of themselves as literate. This and other studies highlight the need to be sensitive to how children's literacy practices traverse physical and virtual spaces (Alvermann, Hagood, & Williams, 2001; Leander, 2007; Pahl, 1999). The empirical description of

children's and adolescents' new mediascapes is essential to understanding how they negotiate social identity in relation to the economies and cultures of late modernity.

Multiliteracies

The term *multiliteracies* was introduced to educational researchers by the New London Group (1996). In this key position paper, a team of leading literacy educators called for literacy pedagogy to respond to the changing social conditions of global capitalism, in particular, the new demands it places on the workforce. The multiliteracies model highlights two interconnected changes in the communicational landscape that impinge on what it means to be literate. These are the increasing significance of cultural and linguistic diversity in a global economy and the complexity of texts with respect to nonlinguistic, multimodal forms of representation and communication, particularly, but not limited to, those affiliated with new technologies. Multiliteracies has evolved into an international pedagogic agenda for the redesign of the educational and social landscape. To this end, multiliteracies sets out to stretch literacy beyond the constraints of official standard forms of written and spoken language to connect with the culturally and linguistically diverse landscapes and the multimodal texts that are mobilized and circulate across these landscapes. Therefore, multiliteracies can be seen simultaneously as a response to the remaking of the boundaries of literacy through current conditions of globalization and as a political and social theory for the redesign of the curriculum agenda. It is an educational agenda that calls for the redrawing of the boundaries and relationships between the textual environments toward the ideological purposes of the design of new egalitarian and cosmopolitan social futures (A. Luke & Carrington, 2002).

Although sharing many of the assumptions of NLS, multiliteracies has at its center the idea of a social and culturally responsive curriculum. It is informed by political pedagogies of literacy, including Paulo Freire and Donaldo Macedo's (1987) construction of literacy as "reading the word and reading the world," Australian approaches to the teaching of writing as genre (Cope & Kalantzis, 1993), and critical literacy and pedagogy models. The transformative agenda of multiple literacies sets out to redesign the social futures of young people across boundaries of difference. With this explicit agenda for social change, the pedagogic aim of multiliteracies is to attend to the multiple and multimodal texts and wide range of literacy practices that students are engaged with. It therefore questions the traditional monologic relationship between teacher and student, setting out to make the classroom walls more porous and to take the students' experiences, interests, and existing technological and discourse resources as a starting point. From this perspective, the social and political goal of multiliteracies is to situate teachers and students as active participants in social change, the active designers of social futures (Cope & Kalantzis, 2000). Overall, multiliteracies pedagogy can be described as developing models of effective critical engagement with student values, identity, power, and design. I return to illustrations of this agenda later in this chapter.

Yet even in its plural form, this and other emergent approaches to literacy continue to be strongly focused on competencies and written lettered representation (Kress,

1997; Marsh, 2005). In what follows, I turn to focus on literacies that move beyond the cognitive and analytic processes of written and spoken language.

Multimodality

Multimodality (Kress, Jewitt, Ogborn, & Tsatsarelis, 2001; Kress & van Leeuwen, 2001), like multiliteracies, has emerged in response to the changing social and semiotic landscape. Key to multimodal perspectives on literacy is the basic assumption that meanings are made (as well as distributed, interpreted, and remade) through many representational and communicational resources, of which language is but one (Kress & van Leeuwen, 2001). This and other aspects of multimodal theory are outlined by Kress and van Leeuwen's (2001) *Multimodal Discourse*. Multimodality attends to meaning as it is made through the situated configurations across image, gesture, gaze, body posture, sound, writing, music, speech, and so on. From a multimodal perspective, image, action, and so forth are referred to as *modes*, as organized sets of semiotic resources for meaning making.

To some extent, multimodality can be described as an eclectic approach, although it is primarily informed by linguistic theories, in particular, the work of Halliday's (1978) social semiotic theory of communication and developments of that theory (Hodge & Kress, 1988). Multimodality has developed in different ways in the decade since its inception around 1996. Although a linguistic model was seen as wholly adequate for some to investigate all modes, others set out to expand and reevaluate this realm of reference, drawing on other approaches (e.g., film theory, musicology, game theory). Multimodality thus extends past the traditional psychological and linguistic foundations of print literacy to draw from anthropological, sociological, and discourse theory (specifically, the work of Barthes, 1993; Bateson, 1977; Foucault, 1991; Goffman, 1979; and Malinowski, 2006; among others). In addition, the influence of cognitive and sociocultural research on multimodality is also present, particularly, Arnheim's (1969) models of visual communication and perception.

From decades of classroom language research, much is known about the semiotic resources of language; however, considerably less is understood about the semiotic potentials of gesture, sound, image, movement, and other forms of representation. A number of detailed studies on specific modes have helped begin to describe these semiotic resources, their material affordances, organizing principles, and cultural referents. Alongside Kress and van Leeuwen's (1996) work on images, other key works that contribute to an evolving "inventory" of semiotic modal resources include van Leeuwen's (1999) work on the materiality of the resources of sound (e.g., pitch, volume, breathing, rhythm, and so on). Martinec's (2000) work focuses on movement and gesture. With a focus on writing as a multisemiotic resource, Kenner's (2004) ethnographic case studies show how young bilingual learners (Spanish, Chinese, and Arabic) use directionality, spatiality, and graphic marks to realize meaning and express identities.

From this work, we know that people draw on their available modal resources to make meaning in specific contexts. Furthermore, the resources come to display regularities through everyday patterns of use. The more a set of resources has been used in the social life of a particular community, the more fully and finely articulated its

regularities and patterns become. Consequently, any given mode is contingent on fluid and dynamic resources of meaning, rather than static skill replication and use. These modes are constantly transformed by their users in response to the communicative needs of communities, institutions, and societies: New modes are created, and existing modes are transformed. Flewitt's (2006) multimodal study of preschool classroom interaction demonstrates the strong link between the communicative demands of a context and the modes in use. Flewitt's research draws on data from ethnographic video case studies of young children communicating at home and in a preschool playgroup. By focusing on all modes of communication (talk, gesture, movement, gaze, and so on), she is able to scrutinize young children's multifunctional uses of different modalities in meaning making. Flewitt's "analysis of children's uses of different semiotic modes as intentional, socially organized activity in the construction of meaning" argues against "pathologizing the absence of talk" (p. 47). This work, then, offers a different account of classroom language by locating the analysis of classroom talk in the broader context of children's total multimodal resources.

The concept of *modal affordance* refers to what it is possible to express and represent easily. How a mode has been used, what it has been repeatedly used to mean and do, and the social conventions that inform its use in context shape its affordance. Where a mode "comes from" in its history of cultural work becomes its provenance, shaping available designs and uses (Kress, 2003). Furthermore, the affordance of a mode is material, physical, and environmental. For instance, an image in the form of graphic marks on a two-dimensional surface offers different potentials for the expression and representation of meaning than the affordances of speech in the form of sounds. Physical, material, and social affordances affiliated with each mode generate a specific logic and provide different communicational and representational potentials. For instance, the sounds of speech occur in time, and this temporal context and location shape what can subsequently be done with (speech) sounds. This makes the logic of sequence in time unavoidable for speech: One sound has to be uttered after another, one word after another, one syntactic and textual element after another. This sequence therefore constitutes an affordance, producing the possibility and constraint for putting things first or last or somewhere else in a sequence. It can be said, therefore, that the mode of speech is governed by a temporal logic. By contrast, the affordances of (still) images can be understood as being governed by the logic of space and simultaneity. In sum, multimodality approaches affordance as a complex concept connected to the material *and* the cultural, social, historical use of a mode.

Alongside the assumption that all modes in a communicative event or text contribute to meaning, models of multimodality assert that all modes are partial. That is, all modes, including the linguistic modes of writing and speech, contribute to the construction of meaning in different ways. Therefore, no one mode stands alone in the process of making meaning; rather, each plays a discrete role in the whole. This has significant implications in terms of epistemology and research methodology: Multimodal understandings of literacy require the investigation of the full multimodal ensemble used in any communicative event. The imperative, then, is to incorporate

the nonlinguistic representation into understandings of literacy in the contemporary classroom. It also has implications for contemporary theorizations of literacy pedagogy, curriculum, and learning in the school classroom.

MULTIPLE LITERACIES IN THE SCHOOL

The question of how theories of literacy are understood and used by educational policymakers and educators directly affects classroom teaching and learning. In the processes of "doing" literacy, students learn "what counts as literacy" (Unsworth, 2001). The classroom construction of literacy occurs through the legitimation and valuing of different kinds of texts and interactions.

Multiple literacies challenges the current organization of traditional schooling. It gives rise to questions of the relevance of dominant models of literacy as it is currently taught in the majority of schools around the world in relation to the communicative and technological requirements of contemporary, digitalized society. Generally speaking, school literacy is criticized where it continues to focus on restrictive print- and language-based notions of literacy (Gee, 2004; Lam, 2006; Leander, 2007; Sefton-Green, 2006). In this context, what is positioned as *new* literacy practices in the school may be *new to school* but are often already well established among many young people (Lankshear & Knobel, 2003). Increasingly, the communicational landscapes occupied by young people originate outside of the school. This has entailed changes in family life, the traditional access point for children's texts, enabling new ways for children to be the producers and disseminators of information (Carrington, 2005).

Five key themes that draw on multiple and multimodal literacies are discussed in the next section of the chapter: pedagogy, design, the new literacy worlds of students, shapes of knowledge, and shapes of learning. Given emergent local foci of multimodal practices, research in this area is small scale, ethnographic, and case based—with limited analysis on the impact on teaching and learning. Much of this work is descriptive and offers detailed inventories of the resources used by students and teachers, how these are designed into multimodal ensembles, and the implications for the construction of school knowledge, pedagogic relations, and learner positions.

Pedagogy

The theoretical frameworks of multiple literacies have been taken up, adapted, and extended to explore literacy development in a variety of contexts. This has led to the articulation of multiliteracies theory into pedagogic models and practices. Five factors are identified as key to these pedagogic models (Cope & Kalantzis, 2000; New London Group, 1996). Although the following pedagogic sequences are not necessarily linear, the model begins with immersion in an acquisition-rich environment. The starting point is that of the students and a focus on *situated practice* based on the learners' experiences. Situated practice involves the immersion in students' experience and the designs available to them in their life worlds. *Overt instruction* is the key pedagogic strategy through which students are taught metalanguages of design, that is, the systematic and explicit teaching of an analytical vocabulary for understanding the design processes and

decisions entailed in systems and structures of meaning. *Critical framing* is key to this pedagogical model, explicitly connecting meanings to their social contexts and purposes to interpret and interrogate the social and cultural context of designs. *Transformed practice* is the fourth pedagogic factor, which relates to the ways in which students recreate and recontextualize meaning across contexts (Cope & Kalantzis, 2000). This model has evolved and been developed by others; for example, Unsworth (2001) offers a pedagogic learning development cycle model that combines systemic functional grammar with the four stages of multiliteracies pedagogy. The model is designed to make the multimodal design of texts explicit to children as one way to explore the construction of stories in both conventional print and digital formations (Unsworth, 2001; Unsworth, Thomas, Simpson, & Asha, 2005). Some examples of research on multimodality and multiliteracies and learning are discussed below to show multiple literacies in action.

Significant pedagogic work is realized through a range of modes. Ethnographic studies of multimodal practices of science and English classrooms in the United Kingdom show that this holds true even in a curriculum context such as English where talk and writing dominate the classroom (Kress et al., 2005). The Multimodal Production of School English project (Kress et al., 2005) involved detailed video recording and observation of 9 English teachers in three inner London schools, interviews with teachers and students, and the collation of texts made and used in the classroom. The project shows the complex ways in which image, gesture, gaze, interaction with objects, body posture, writing, and speech interact in the classroom production of school subject knowledge. The School English project highlighted how students and teachers coproduce notions of ability, resistance, and identity in the classroom through their nonverbal interaction. The way in which classroom displays, space, furniture, and artifacts were designed to realize versions of English as a school subject was also documented. This research showed that the work of interpreting school English is beyond language and requires the ability to make sense of a range of modes and the relationships between them. It also highlighted the complex multimodal identity work that students are engaged with in the classroom.

A considerable body of work has been undertaken in schools within the diverse cultural and linguistic context of South Africa. Both examples demonstrate how multimodality and multiliteracies can be operationalized as pedagogic practice.

The Arndale Alphabet (Janks & Comber, 2006), *A is for Arndale, A is for Atteridgeville*, was set up as a shared, cross-continent primary school project that situated literacy in the students' experiences and concerns of their neighborhoods (one in South Africa and one in Australia). The project recruited learners and teachers from Grades 3 to 6. Data involved videotapes, teacher and student interviews, and students' work with alphabet books. Working with a class of students in each school, an alphabet book was made that drew on the students' experiences and use of available designs. The students were given overt instruction through the analysis of the representational meanings in other alphabet books, analysis of how image and word were organized, and identification of patterned meanings. The students undertook deconstructive and reconstructive critical analysis and text design. The students engaged in

critical interpretations of the social and cultural contexts of designs of meanings. The project moved beyond literacy as recount to literacy as explanation across differences, involving the students in the work of imagining the other class in another context as the audience for their book. Such pedagogic projects that involve the development of students' literacy resources and a range of modes of representation in conscious ways have been developed to provide students with tools for critical analysis and the redesign of meaning. By establishing a transnational pedagogic context, Janks and Comber (2006) document the impact of new, multimodal pedagogic spaces and practices on social and cultural identities.

In the Olifantsvlei fresh stories project, Stein (2003) undertook a literacy project for 6 months with Grades 1 and 2 teachers and students at a Johannesburg primary school that serves children of unemployed and migrant families living in informal settlements. She worked with multimodal literacy practices and pedagogy through a systematic use of different semiotic modes to develop forms of learning beyond language. The project explored the relations between creativity, multimodal pedagogy, representation, and learning. Student case studies involved observation and interviews, students' use of 2-D drawings, writing, 3-D figures, spoken dialogues, multimodal play, and performance to create narratives of identity and culture. The focus was on the representation of doll and child figures and their symbolic meanings. Stein describes the children's transformation and recontextualization of culturally and historically situated practices of these representations. Stein argues that multimodal pedagogy enables the assertion of student identity, cultural practices, and community to enter the school context in ways that are significant for literacy and teaching.

Significant research has been conducted on the technologization of school literacies and pedagogy (e.g., Alvermann et al., 2001; Cope & Kalantis, 2000; Lankshear & Knobel, 2003; Leander, 2007; Marsh, 2005; Unsworth et al., 2005). It explores and theorizes the nature of image and text relations in literacy narratives, relationships between book- and computer-based versions of texts, and the role of online communities of various kinds in the critique as well as the interpretation and generation of new forms of multimodal and digital narratives and literacies. This work often describes new forms of literacy in an attempt to remap the territory of new literacies and the kinds of practices that help move across it, such as blogging and culture jamming (Lankshear & Knobel, 2003; Sefton-Green & Sinker, 2000). Knobel and Lankshear (2006; Lankshear & Knobel, 2003), for example, discuss the potential of new forms of literacy for learning, including blogging and the use of wikis. Their detailed case describes the out-of-school technoliteracies of young people and the extent to which it is possible or desirable to import these out-of-school cultural practices into the classroom for school literacies such as extensive writing. They identify the difficulties in bringing out-of-school cultural practices into the classroom, including the compulsory character of schooling, the individualization of student identities, the lack of authentic purposeful activities, and how interests and technoliteracies are socially constituted and regulated through adult control in classroom spaces. They conclude that different conditions and new virtual and institutional spaces will be required to enable their effective use (Knobel & Lankshear, 2006; Owen, Grant, Sayers, & Facer, 2006).

Although it is the case that multimodal research and multiliteracies are often strongly associated with the introduction of new technologies, this perspective is relevant for the analysis of traditional classroom technologies. These approaches have been used to examine the ways in which teachers orchestrate a range of modal resources, gesture, gaze, position, posture, action with books and boards, and talk in the classroom. In addition, multimodal research has examined the ways in which language policy, student identities, official curriculum, examination, and school knowledge are mediated through multimodal communication in the classroom (Bourne & Jewitt, 2003; Kenner & Kress, 2003; Kress et al., 2001, 2005). Comparative multimodal analysis has examined how these patterns vary across systems and cultural contexts (Bhattacharya et al., 2007). Working across three cities (Delhi, Johannesburg, and London), Bhattacharya and colleagues (in press) undertook in-depth case studies focused on English lessons (with students ages 14 to 15 years), interviewing teachers and students. The multimodal analysis examined and compared how texts were pedagogically activated, circulated, and drawn into practices and processes to be remade and transformed by students. The project identified ways in which language policy, modal conventions and practices, teacher identities, and subject histories were realized through the textual cycle of the classrooms. Here, the multimodal approach engages with the entire classroom event as a kind of text in motion in which multimodal texts are caught up and actualized in the stream of practice. Work within this framework tends to be analytical research that identifies the conditions and processes of learning, the ways in which students draw on practices, the social categories and practices that inform pedagogy, and so on, rather than presenting a theory of pedagogy itself.

In light of a general move toward explicitness and transparency in educational approaches to literacy, pedagogic models drawing on multimodality and multiple literacies are often accompanied by overt instruction and critical framing. These aim to introduce technical metalanguages for different modes. This has led to efforts to augment the technical language of linguistics (e.g., genre, grammar, and discourse) to describe and explain the semiotic contribution of each mode to multimodal texts (Unsworth, 2001). Substantial theoretical descriptions of the dynamics of interaction between image and language have been offered, for example, by the early work of Kress and van Leeuwen (1996) and Lemke's (1998) work on science textbooks. Recent work by Kress and Bezemer (2007) examines contemporary curriculum materials and investigates the learning gains and losses of different multimodal ensembles. This work draws on a corpus of learning resources for secondary school in science, mathematics, and English from the 1930s, the 1980s, and the first decade of the 21st century as well as digitally represented and online learning resources from the year 2000 onward. It sets out to provide a social semiotic account of the changes to the design of these learning resources (textbooks and websites, etc.) and of their epistemological and social-pedagogic significance. Through investigation of the relationship between image, writing, action, and layout, they show that image and layout are increasingly meshed in the construction of content. Research on the multimodal resources of digital screen-based texts also supports this finding: that in complex multimodal texts, the boundaries between modes blur and

mesh in new configurations. These affect the construction of knowledge and identities (Jewitt, 2006; Leander, 2007; Pelletier, 2005, 2006).

This potential remaking of modes in new contexts raises fundamental questions about how best to articulate their relationships (Kress et al., 2001, 2005; Kress & van Leeuwen, 2001; Unsworth, 2006). It also places a crucial reservation on the teaching of a technical metalanguage of multimodal meaning: the risk of a static grammar of modes that cannot account for the power of context and the transformative character of systems of making meaning. In addition, this has the unintended potential to produce another form of "Big 'L' Literacy" (Gee, 1990), a normative resource to regulate meaning and uphold and reproduce dominant cultural practices across all modes. There is the potential, then, for the overt teaching of metalanguages to reproduce the links between available designs (e.g., genres) and their cultural and ideological relations and functions. As parts of the social system of communication, all modes work to realize culture and power. Image is as ideological and as power laden as word. This raises important issues about how image, word, and design of other modes are understood as available resources for meaning making in the classroom.

Design

Traditional pedagogic models for print literacy are based on the acquisition and mastery of sets of established practices, conventions, and rules. The multiple literacies model holds that limited models of skill and competence are incomplete. Models of critique encourage students to be aware of principles of dominant notions of literacy, to question these and the ideologies they represent, and to explore the production of innovation and change. In contrast to traditional competence-based pedagogic models, the New London Group (1996) and Kress (2000) identify the notion of design as an active and dynamic process central to communication in contemporary society. Design refers to how people make use of the resources that are available at a given moment in a specific communicational environment to realize their interests as sign makers. In this way, design has been used to theorize the relationships between modes, pedagogy, and context and to understand the changed dispositions toward information and knowledge. It foregrounds the importance of multimodal resources, the sign maker's social purpose and intentions, context, and audience (Kress, 2000, 2003). Furthermore, the New London Group (1996) draws on design to understand the multimodal organization of social relations through the design of communicative resources, including linguistic meaning, visual meaning, audio meaning, and gestural and spatial meaning. Although design incorporates some of the aims inherent in models of competence and critique, it provides a more flexible and dynamic analytical frame that responds to the interests of the sign maker and the demands of the context.

As a research tool and way of thinking about literacy as process, design is useful in analyzing how materials in the classroom (e.g., textbooks and the materials displayed on interactive whiteboards [IWB], media images) include image and writing and other modes, in configurations that distribute meanings across the boundaries of modes and multimodal connections. This is but one part of pedagogic design, which can be

conceptualized as a semiotic chain of meanings across different contexts. From this perspective, design can be used to refer both to teachers' pedagogic designs of learning processes and students' designed constructions of meaning. This includes student engagement, interaction, and remaking of the available designs. For instance, a printed textbook, website, or other teaching material is designed, accessed by the school or teacher, downloaded, and printed or perhaps scanned and made digital to be displayed on a screen or IWB. These materials may then be manipulated by students, annotated by the teacher, and saved and stored. Later, the remade text may be accessed, reappraised, and reworked on an Internet revision site. The emphasis is on the activities and processes of interpretation students engage with, framing how students make sense of ("read") multimodal signs in the classroom as itself a process of redesign. Moss's (2003) ethnographic research focuses on U.K. students working with junior-age nonfiction texts as objects of design. Moss's research draws on a large data set built up from a series of interlinked ethnographic research projects consisting of observations, field notes, interviews, and conversations about reading between boys perusing nonfiction together in informal contexts within the school classroom. Her research shows how the layout structure of factual books affects the ways in which it is read by young boys, specifically, how they sequence the page, create reading paths, negotiate their roles and identities in the classroom, and identify opportunities for performing being a reader. In so doing, Moss's study begins to describe and theorize the broader set of practices of remaking, "mashing," and "remixing" in the digital, multimodal mediascape.

Efforts to retheorize the design of school pedagogy have drawn on notions of design. Kress and Selander (in press) have developed a model, learning design sequences, which is based on the need to move away from designed information and teaching sequences involving prefabricated learning resources, formalized work, and strict timetables, which, they argue, place the teacher as the conduit of knowledge. They argue instead for the need to shift toward learning design sequences that encompass the multiplicity of learning. Their model attempts to map critical incidents across learning as sign making, moments of transformation, representation, and presentation. This work, although at an early stage, sets out a model of pedagogy based on the theorization of the redesign (transformation) of knowledge.

Literacy Worlds of Students

Recent ethnographic studies suggest that conventional print literacy pedagogy proceeds independently of the everyday multimodal social and communicative worlds of many urban children (e.g., Marsh, 2006). It is axiomatic in NLS that schools construct and shape students' literacy in particular ways for specific social purposes. It follows that the extent to which school literacies across the curriculum engage, incorporate, or colonize students' out-of-school literacy practices is a matter of power; it is about what is allowed to count, to whom, and for what purpose. The physical and social boundaries of schools and the curriculum vary in their porosity. Although there are clearly many similarities across schools, it is nonetheless true that in general, primary schools are differentially permeable than secondary schools, London schools are differentially

positioned in relation to community practice than those in Delhi or Johannesburg, and subject English is differentially permeable than school science. Furthermore, different texts and experiences are allowed into these different schools and legitimated and mobilized for pedagogic purposes in distinct ways. An example of this is shown in the research on the multimodal production of school English introduced earlier. That study demonstrated how teachers' multimodal design of the classroom environment conveyed what was to be done and learned in it and the place of students' life worlds of "English" (Jewitt & Jones, 2005; Kress et al., 2005). Across the nine teacher case studies, the design of the room connected with the life worlds of students and teachers in different ways. For instance, one case study teacher covered her wall with posters of films and music stars brought in by the students, another displayed carefully framed elements drawn from curriculum and examination documents, and yet another displayed posters of poetry and art exhibitions. These different versions of English (and Englishness) placed students in different relationships to the curriculum content of English and in turn attempted to connect or disconnect English in specific ways to the experiences of those students in ways that are significant for the construction of literacy.

It is the often the case that connecting with students' literacy experiences and knowledge translates into teachers' permitting authorized fragments of students' lives into the classroom. Multiliteracies, as the earlier discussion of pedagogy illustrates, calls for a reexamination of the relationship between school and out-of-school communicative environments. Stein and Mamabolo (2005) undertook detailed ethnographic research in Johannesburg on the connections between home and school and literacy practices across these sites. Drawing on three case studies, they show in detail how families draw on their own resources to negotiate home–school relationships in distinct and different ways. Their findings suggest that this is a key part of the construction of literate identities of students and how they build and negotiate their educational and literacy pathways through school and community life. Marsh's (2006) studies investigate young children's (ages 2.5 to 4 years) mediascapes to identify the complex multimodal communicative practices that they are engaged with in the home. Her focus is on understanding the functions that these digital media expressions have in maintaining the social relations of the family, accessing knowledge, self-expression, and the development of literacy skills. She documents how migrant students reappropriate and use media designs in creative play, family life, and home–school transitions. These studies suggest the possibilities for curriculum that connects with students' out-of-school multimodal repertoires. The questions of where to draw these boundaries, when, and who gets the power to draw are central to the development of new pedagogic approaches to traditional and emergent literacies.

Current pedagogies built on multiple literacies encourage teachers to build classroom work on students' knowledge, experiences, and interests. This involves integrating students' knowledge of narrative characterization and structure developed from visual modes (films, videos, picture books) into the planning and creation of narratives, either print based (e.g., Millard, 2005; Newfield, Andrew, Stein, & Maungedzo, 2005) or multimedia multimodal narratives (e.g., Burn and Parker, 2003; Marsh, 2006; Pahl,

2003). Multiple literacies projects build stories based on and arising from young people's lives and experiences and cultural forms of representation to engage with and gain access to student agency, cultural memory, and home and school learning within local contexts. Newfield and colleagues (2005) undertook a multimodal pedagogy intervention and research project in a Soweto secondary school to develop the students' literacy practices. The starting point for this project was the literacy worlds of the students, infused with many different languages, cultures, music, and performance not usually heard or seen in the classroom. These provided the focus for poetry writing, featuring the design and production of an anthology. The use of performance and visual arts opened up the voices of the students identified as reluctant writers.

Gee's (2003) work on video games and learning connects multimodality, multiliteracies, and the out-of-school literacy worlds of children and young people. He sees game playing as a new space for learning and what it means to be a learner in the 21st century. His theorization of games and learning is based on his own experiences of game play (including observing his son's game playing). Through this account, he identifies 36 learning principles present in game designs that he suggests could be useful for rethinking more formal education. Sefton-Green (2006) questions the generalizability of such an approach. He asks if games are a kind of literacy, whether it is a kind of literacy that can "do anything other than support the playing of more games" (p. 291)

Across different contexts, the concern of multiple literacies is with the promotion of a pluralized notion of literacy and forms of representation and communication to help students negotiate a broader range of text types and modes of persuasion (Morgan & Ramanathan, 2005). This makes it increasingly important for schools to attend to the literacy practices of students and diverse ways of making meaning, in particular, the multilingual, the multimodal, and the digital. In short, there is a need for further investigation of literacy practices as an intertextual web of contexts and media rather than isolated sets of skills and competences. Because of the simultaneity of different modes in everyday community and educational contexts, the decontextualized study of particular practices, assuming their universality and transfer, has clear limitations.

A multimodal approach to literacy focuses on the representations of students across different sites of learning and raises questions for how curriculum knowledge is organized, classified, represented, and communicated. It asks how different representations and modes of communication shape knowledge as well as locate and connect knowledge to the world. It queries what and how teachers and students can do with school knowledge. The focus of the following section is on how these shapes of knowledge affect the interpretative and meaning-making demands made on students.

Shapes of Curriculum Knowledge

As noted at the onset of this review, one of the characteristics of the contemporary communicational landscape is a shifting and remaking of disciplinary boundaries. In the U.K. classroom, for instance, this is realized in a general move to build connections across discourses of specialized knowledges and everyday knowledges, an emphasis on context-based learning, and the introduction of new cross-curricular projects. This

redefining of the boundaries and frames of school knowledge raises interesting challenges for literacies as they are shaped by disciplinary practices and histories. One aspect of this is the reframing and blurring of the boundaries between texts, media, and contexts— which in turn produces new and unsettled genres (Kress, 2003; Moss, 2003). Increasingly, for example, the concept and shape of the book is remade as it is being fully linked to websites and online resources. Leander (2007) has described how textbooks are organized by structures in which the visual dominates. He goes on to examine learning resources that introduce new relationships between image and action and bodies through the use of avatars. Such representations make new demands on students in relation to both how knowledge is represented and communicated and how those representations circulate and are mobilized across time and space (Nespor, 1994). In this technological context, the challenge is for the curriculum to engage with epistemologies that reflect radically different knowledge structures and learning processes (Lankshear & Knobel, 2003).

Image and other nonlinguistic modes take on specific roles in the construction of school knowledge. Kress et al. (2001) undertook an ethnographic study of London school science classrooms. This involved observation and video recording of nine science classes across a half-term topic unit, interviews with students and teachers, and analysis of the texts used and made during the lessons. A key finding of the research was that different modes of representation led to radically different constructions of the scientific and natural world. For example, representation of a cell in the science classroom as an image or through writing, in color or black and white, or as 3-D model or an animated sequence on a CD-ROM or website makes available and foregrounds different aspects of the concept of cell. Each of these representational forms makes different demands on the learner. There was also evidence that different modes have differential potential effects for learning, the shaping of learner identities, and how learners create pathways through texts. The choice of mode, then, is central to the epistemological shaping of knowledge and ideological design. What can be done and thought with image or writing or through action differs in ways that are significant for learning. In this regard, the long-standing focus on language as the principal, if not sole, medium of instruction can at best offer a very partial view of the work of communicating in the classroom.

Furthermore to this, the technology of production, dissemination, and communication that is chosen is also key to the shaping of curriculum knowledge. These curriculum and pedagogic choices and configuration of modes systematically favor specific patterns of interaction and artifact production. Therefore, the teacher's and students' interaction with the materiality of modes (an inextricable meshing of the physical materiality of a mode and its social and cultural histories) and the facilities of technologies shape the production of school knowledge.

There is, then, an increasing interest in investigating the role that different semiotic modes or sign systems have in classroom communication. Multimodal research has shown, for example, that images feature in significant ways across the curriculum, as sound, animation, and multimodal configurations are increasingly understood as key to how people learn in the science classroom (Kress et al., 2001; Lemke, 1998; Marquez,

Izquierdo, & Espinet, 2005; Prain & Waldrip, 2006; Scott & Jewitt, 2003). Even in the subject English classroom, where common sense would have it that language is the dominant communicative means, the meanings of language, speech, and writing are embedded in a multimodal ensemble. There, significant, often contradictory, meanings are realized visually or through gesture, proximics, image, and so forth (Kress et al., 2005).

Across both print and digital media, the relationship between image and writing in educational materials (e.g., textbooks, websites, etc.) appears to be in historical transition (Jewitt, 2006; Kress & Bezemer, 2007). This change relates both to quantity and, perhaps more importantly, to the quality and function of images in a text (Jewitt, 2002). Images are no longer illustrative of writing on the page or screen; rather, a phenomenon may now be introduced and established visually. On-screen resources frequently place image, action, sound, and other modes (including the body) in new intertextual relationships that redefine and foreground space and time (Leander, 2007). The relationship between modes in learning materials raises important questions for learning, all of which require a better understanding of the gains and losses realized through the representation of curriculum concepts in one mode as compared with another (Kress & Bezemer, 2007).

Although these issues are not exclusive to the use of new technologies, the multimodal facilities of digital technologies enable image, sound, and movement to enter the classroom in new and significant ways. These new multimodal configurations can affect pedagogic design, text production, and interpretative practices. The visual character of writing comes to the fore on screen to function as objects of literacy in fundamentally different ways than it does on the page (Boulter & Grusin, 1998; Jewitt, 2002, 2005). Jewitt's (2002) case study on the transformation from printed novel to novel as CD-ROM showed how the visual character of writing on screen combined with the dominance of image alongside action serves to restructure texts and fragment and break up forms of writing. A study of the use of IWBs in London secondary schools (Moss et al., 2007) suggests that this kind of modularization can be seen across the curriculum as information breaks up across the screen. However, similar findings have emerged on the organization of time in nontechnologized classrooms. This breaking up of information into bite-size chunks occurs regardless of media and mode as a pedagogic response to the management of information and attention (Jewitt, Moss, & Cardini, 2007). Another potential resource of digital technologies is the mode of hypertext, which embeds writing and image (and other modes) into web-like patterns and layers of information and genres that make meaning making a process of navigation and choice and create new resources (and demands) on meaning making (Jewitt, 2002; Lemke, 2002; C. Luke, 2003; Zammit, 2007).

Multimodal approaches to shapes of knowledge raise serious issues about teachers' access to materials (e.g., websites, CD-ROMs, games and simulations, textbooks and worksheets) and technologies and how these are used in the classroom. Freitas and Castanheira (2006) studied the use of textbook images in 1st-year high school biology classrooms (36 students ages 17 to 30 years old) in Brazil. In these classrooms, only 20% of students were able to afford to purchase the textbook adopted for the class; the effect

is that the graphic representations are available only to the teacher. Their research shows that it is essential to better understand how teachers' display and use of the textbook representations, their classroom talk, and gesture all interact in the construction of scientific knowledge. Drawing on video recordings of classroom interaction, interviews with the teacher and students, field notes on classroom interaction, and copies of notebooks, textbooks, and tests, they found that teachers' coordinated use of semiotic modes to supplement each other in the construction of biology concepts was relied on by students to infer conventionalized meanings. At the same time, however, they found that the contradiction between the frames of reference in teachers' gesture and talk and the visual image in the textbook led to breakdowns in students' understandings of the concepts taught.

The issue of breakdowns and multimodal interpretation across resources is equally salient for students working independently with a CD-ROM or watching a teacher model a process on the whiteboard or visualizer. The point is that learners, whatever their age, may engage with some modes and not others or privilege (trust) one mode over another. For example, case study observation of 11- and 12-year-old students using an animation of particles in a science lesson found that students interpreted the visual information independently from the written information provided on the CD-ROM screen (Jewitt, 2006). This appeared to be because of the CD-ROM's emphasis on empirical reality, observation, and visual evidence supported by the classroom practices within school science. Many students missed important cues about the observed sequence. This finding serves to emphasize the need to examine literacies through the "tension between the meaning potential of the text, the meaning potential of the context in which it will be read and the resources that the reader brings to that exercise" (Moss, 2003, p. 85). When using learning resources that demand the interpretation of movement, image, and color, students are engaged in a complex process of sense making. Multimodal analysis thus offers a way to broaden the lens of educational research and investigate the role of image and other nonlinguistic modes as well as to better understand the role of language as one multimodal resource.

The examples here highlight the importance of understanding how knowledge is shaped through the teacher's choice of one mode over another and the consequent constraints and possibilities those choices introduce. In this way, the representation of curriculum knowledge can be viewed as a process of pedagogic multimodal design, of the matching of target knowledges with particular modal affordances. In this process, meanings are made and remade (designed) when representations are enlivened in the classroom and again when students engage with them for the purposes of making their own meanings in lesson practices.

Learning

Seeing the communicational landscape of the classroom through a multimodal lens has significant implications for conceptions and processes of learning. Thinking about learning as a process of design and choice of representation gives a renewed focus on the role of the learner. Design, diversity, and multiplicity emphasize the meaning-making practices and interpretative work of students. From this perspective,

the multimodal texts and artifacts that students make can be viewed as one kind of sign of learning, a material trace of semiosis. These texts can be understood as material instantiations of students' interests, their perception of audience, and their use of modal resources mediated by overlapping social contexts. The interpretative work of students is reshaped through their engagement with a range of modes, image, animation, hypertext, and layered multimodal texts. In such a view, students need to learn how to recognize what is salient in a complex multimodal text, how to read across the modal elements in a textbook or IWB, how to move from the representation of a phenomenon in an animation to a static image or written paragraph, and how to navigate through the multiple paths of a text. These complex tasks—as against traditional taxonomies of print skills—are central to multimodal learning and development. Learning increasingly involves students in working across different sites of expression, negotiating and creating new flexible spaces for planning, thinking, hypothesizing, testing, designing, and realizing ideas (Jewitt, 2006).

New skills for reading, finding information, authenticating information, and manipulating, linking, and recontextualizing information are demanded in this multimodal symbol-saturated environment (Beavis, 2006; Kress, 2003; Leander, 2007; A. Luke, 1996). Along with the choice of what mode to read, the structure of many digital texts opens up options about where to start reading a text—what reading path to take. This is a question that is intrinsically linked to how the relationship between modes and layout (itself an emergent mode) mediates the practices of reading and writing. The multimodal design of texts in the contemporary digital landscape often offers students different points of entry into a text and alternative possible paths through a text, highlighting the potential for readers to *remake* a text via their reading of it. The reader is involved in the task of finding and creating reading paths through the multimodal, multidirectional texts on the screen—an openness and fluidity of structure that seeps onto the page of printed books (Kress, 2003; Moss, 2001). Writing, image, and other modes combine to convey multiple meanings and encourage the reader to reject a single interpretation and to hold possible multiple readings of a text (Coles & Hall, 2001). In addition, new technologies make different kinds of cultural forms available, such as computer games and websites.

Flexible, interactive, and relatively fluid hypertexts offer the ability to redefine reader, author, and text relations (as the reader constructs the text in reading it). The ability to work fluently across many modes and "historically discrete domains" is required by new technologies (Sefton-Green & Reiss, 1999, p. 2). These facilities combine to increasingly align reading with the production and consumption of images alongside writing. The conceptual shift demanded by hypertext is, C. Luke (2003) suggests, from one of "collection to connection" (p. 400), a move that underlies the production of complex hybrid semiotic systems and new repertoires and demands for literacy. In this rich semiotic environment, a digital novel can be a multimodal configuration of music and songs, voices, sketches, maps and photographs, video clips, and written prose. Complex multimodal texts set the conditions for students to remake genres, to read texts variously as a musical, a short film, a comic book, or any other genre (Jewitt, 2002).

In addition to changing the work of interpretation, new technologies offer the possibility of new spaces for publication and dissemination. This has the potential to build new relationships between readers and writers in a manner that challenges and breaks down some of the traditional distinctions between reader and writer. Online fan-fiction forums, for example, enable children to move between various identity categories, such as writer, reviewer, or editor of other fans' stories; writing mentor involved in coaching other writers, adding paragraphs and offering suggestions; a summary writer, writing summaries for stories posted on the site; illustrator, making graphic art for others' stories; a critic, rating and commenting on posted stories; or a collaborative writer, working as a member of a team. These open up new spaces for identity play and for reflecting on audience and process, which are important for thinking of literacy. The ways in which people use language and make sense is inextricably linked to the beliefs and values of particular communities and the sense of self. A change in discourse practices, Gee (2003, 2004) says, potentially marks a change of identity. Accordingly, as many of the studies reviewed here show, multimodal learning involves the ongoing design and redesign of identities across the social and cultural practices of meaning making.

Learning often involves adopting a specialist language, an epistemological shift leaving one world of experiences for another. This can be expressed as both a loss and a gain of new possibilities and new identities. Any design of learning needs to make clear both the gains and how these are to be offset against what is to be lost (Gee, 2003; Kress, 2003; Kress & Bezemer, 2007). In the context of contemporary theories of education and communication, learning is increasingly discussed in terms of the creation of particular dispositions and orientations to the world rather than people who are in command of a body of knowledge. Accordingly, success at multimodal learning can be coupled with the ability to be autonomous and self-directed designers of learning experiences (Gee, 2004), to possess problem-solving skills with multiple strategies for tackling a task, and to have a flexible solutions orientation to knowledge (Cope & Kalantzis, 2000). The increasing recognition of literacy as a social practice that evolves around the situated interests of people suggests the need to "acknowledge the ways in which we position children within these social practices and landscapes" (Carrington, 2005, p. 121).

The five interconnected themes introduced and discussed above—pedagogy, design, the literacy worlds of students, shapes of knowledge, and multimodal models of learning—feature prominently in the emergent literature on multimodality.

FUTURE DIRECTIONS

This review combined the perspectives of models of multiliteracies and multimodality to examine the character of literacy in the communicational landscape of the 21st century. In doing so, it has highlighted some of the new possibilities and constraints for representation and communication that this landscape may generate in the school classroom. Central to these are the new demands placed on the literacy practices and communicational repertoires of students in terms of their capacities to participate in the global knowledge economy, education, and everyday life. These

practices potentially transform how reading, writing, meaning making, and literacy more generally are understood. The studies here have stressed the multimodal character of literacy in the contemporary era and the need to uncouple the traditional conjunction of language and learning. Much of the work reviewed here has been of necessity small scale and case- based, tabling new theories and developing new research methods for observing pedagogy and curriculum across modalities that are still in formation. They raise significant questions for curriculum and pedagogy, and they point to the limitations of research methods that have heretofore focused on language and print as principal learning media. Although some educational systems now officially recognize the importance of multiliteracies and multimodality (e.g., state curricula in Australia, South Africa, and Canada), the implications of this work for teacher education and curriculum policy are still emerging.

Research within multiliteracies and multimodal design provides pedagogic models, principles, and strategies for the classroom. Teachers and policymakers can reflect on, adopt, and adapt these toward developing situated pedagogic approaches that connect with contemporary multimodal literacy practices. Two key aims of these models are, on one hand, to better understand and connect with students' literacy worlds and mediascapes and, on the other, to build on these to develop students' explicit understanding of a broad range of multimodal systems and their design. Both these strategies require educational policy, curriculum, and teachers to place students as active participants at the center of the classroom (at least to some extent). Pedagogy can be seen as a process of design.

Pedagogic understanding of students' mediascapes demands the adoption of strategies for engaging with the literacy worlds of students and their interests and desires. The theoretical and pedagogic focus of multimodality and multiliteracies can support teachers in engaging with the resources that students bring into the classroom. This includes understanding students as sign makers, the texts they make as designs of meaning, and the meaning-making processes that they are engaged in. These can give insights into the kinds of resources that students have access to (as well as those that they do not). Rethinking the role of the learner in literacy in this way raises the question of how to design the relationship between literacy spaces in school and out of school. These are regulated by curriculum and educational policy in different ways: with an increasing acknowledgment in early childhood literacy curriculum of the centrality of students' background knowledge and home practice but little explicit acknowledgment of their multimodal resources.

Furthermore, these connections and disconnections are re-mediated by teachers and schools in different local contexts for different purposes. Teachers, curriculum designers, and policymakers can begin to take the porosity of the classroom or school boundaries (physical, emotional, and technological) as a pedagogic resource to be designed in different ways, depending on their purpose. What is it that it is useful to connect or disconnect with? Why and to what ends? These basic curriculum questions return us to the key finding of this review: that the classroom is one node in the complex intertextual web of the communicational landscape of young people *even when it appears*

isolated and autonomous. Indeed, the classroom may increasingly involve, as it does currently in relation to some online spaces, the remaking of the connections and boundaries of different spaces of learning and literacy. A key issue then becomes what kinds of artifacts, modes, and literacy are legitimated in different spaces, and what is enabled to flow and move across these spaces? This is particularly important in the contemporary digital era (at least in some global contexts) where the modal dominance of writing- and print-based medium of school stands in stark contrast to the multimodal spaces of leisure (e.g., games, film, online spaces) out of school.

Multimodality and multiliteracies can help to support the pedagogic task of developing students' explicit understandings of a broad range of multimodal systems and the design of these. The need is to move away from a monocultural and monomodal view of literacy. One way in which teachers, curriculum, and policy can respond to this task is to broaden the diversity of signs and cultural meanings that circulate in the classroom. Multimodal texts may be used by teachers in the classroom as the basis for critical engagement, redesign, or the explicit teaching of how modes construct meaning in specific genres. Teachers may design explicit teaching on a range of modal resources, concentrating, for example, on the main semiotic resources of image. As in the case of language, this will produce norms and grammarlike rules that may later need to be critiqued if the pedagogic focus on diversity and plurality is to be realized. In the New London Group (1996) model, and in much of the U.K., South African, and U.S. work discussed here, multimodality has been linked to an agenda for social justice, equity, and access for all learners but can unintentionally negate the reality that all modes realize ideology and power relations. As a multimodal and global context dominated by corporate and mass media communications, the ideological functions of modes and how these are associated with power and elite forms of literacy are central problematics.

A multimodal approach to shapes of knowledge helps to highlight the particular affordances and resistances of learning resources. This brings to the fore the questions of what curriculum resources can be designed to do (and not do) and what teachers and students actually do with multimodal texts in the classroom. These are important design decisions that affect the selection and shaping of knowledge. For instance, the ways in which teachers design and use pedagogic materials shape how students can remake a text through its possibilities and resistances or how they can navigate the designed relationship of image and writing and identify possible reading paths. These are everyday design decisions that students and teachers make constantly in the classroom. At another level, they are decisions that curriculum developers and policymakers are also engaged in, including through the possibilities for interaction and identity formation that are designed into a curriculum, the interpretative demands that these make on students, and the criteria and activities for assessing this. Multimodal research offers ways of making the design of these decisions explicit and sheds light on breakdowns in understanding and the variety of readings of a text by a class of students. How teachers and students use gaze, body posture, and the distribution of space and resources produces silent discourses in the classroom that affect literacy.

Multimodality offers teachers the potential to reflect on their pedagogic use of the resources of their body, to critique and redesign these aspects of their practice.

A multimodal perspective highlights the complex pedagogic work of designing curriculum knowledge across modes in the classroom. Teachers as well as curriculum designers and policymakers may employ multimodal tools (such as modal resource or modal affordance) to reflect on how image, action, and other modes feature in the classroom. Multimodality offers new ways to think about learning via a focus on meaning making as a process of design. It approaches communication as a process in which students (as they are socially situated and constrained) make meanings by selecting from, adapting, and remaking the range of representational and communicational resources (including physical, cognitive, and social resources) available to them in the classroom. Through understanding how people select modal resources, multimodality emphasizes the dynamic character of meaning making toward an idea of change and design. In this way, meanings, as well as meaning making resources, are constantly reconfigured and newly remade through the social work of the sign maker. Rethinking literacy beyond language can support teachers, curriculum, and educational policy in the work of connecting the school, children, young people, and the demands of the contemporary communicational landscape.

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