

Technology, learning and instruction: distributed cognition in the secondary English classroom

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Abstract

In this paper, we analyse interactions between secondary students and pre-service teachers in an online environment in order to understand how their meaning-making processes embody distributed cognition. We begin by providing a theoretical review of the ways in which literacy learning is distributed across learners, objects, tools, symbols, technologies and the environment in modern English language arts classrooms. This is followed by a case study where we identify how programme values, textual resources and cultural schema function as distributed tools. In traditional schools, with an emphasis on taking standardised tests, the learning environment is designed on the view that learning is a transaction that happens solely 'inside the head'. Unfortunately, this pushes many students to the margins of classroom engagement and participation. By analysing students' and pre-service teachers' online discourse, we argue that virtual spaces can facilitate critical dialogue and can act as catalysts for a distributed theory of mind.

Key words: digital literacies, distributed cognition, pre-service teacher education, multimodality, critical literacy

Introduction

In this paper, we respond to Elizabeth Birr Moje's (2009) call for research that investigates "new and multiple media, literacies, practices, and processes" (p. 348). To do so, we first provide a theoretical review of the ways in which literacy learning is distributed across learners, objects, tools, symbols, technologies and the environment (Gee, 2004) in contemporary English language arts classrooms. A case study example follows from a secondary English classroom in the United States that used online discussions and technological tools as resources for cognitive meaning making. Our paper shows that a skilful teacher/knowledgeable other cannot be discounted as we consider the many factors involved in students' literacy learning.

In this text, we investigate the following questions:

1. How can distributed cognition be enacted in literacy teaching and learning?
2. What is the intersection of tools, culture and social context within a frame of distributed cognition?

Laying the groundwork: cognitive apprenticeships and distributed learning

To set the stage for our arguments, we turn to Black's story (2008) of an adolescent Chinese immigrant to Canada named Nanako who was a quiet, introverted English language learner. Upon arrival to her new country, Nanako only succeeded at mathematics in school, and she had very few friends. However, in locating the Fanfiction.net (FFN) website, Nanako discovered a group of like-minded teens who read and wrote stories that built on familiar popular culture and anime storylines. On the FFN website, Nanako's participation was scaffolded by an older writer named Grace (also an English language learner) who had been writing fan fiction and seeking critique/s of her writing for several years. With Grace's postings and textual moves as cognitive maps for her writing, such as requests for what features of her writing to attend to, which dimensions readers might ignore and those on which they might comment, Nanako began to read, write and critique others' writing on the site in English. As a cognitive apprentice, Nanako took cues from Grace's texts, and she became more skilful in the structural and content features of her own work (Bandura, 1977; Brown et al., 1989; Collins et al., 1987). At school, Nanako was viewed as an individual who could not read, write or speak English with skill; however, on the FFN website she was regarded as a highly successful community member. Through her participation in this online space, Nanako was validated as an author – and an English speaker.

Brown et al. (1989) assert that the cognitive apprenticeship Nanako received from Grace and other FFN writers on the site can be seen within a "nexus of activity, tool, and culture" (p. 40). In other words, in order to fully understand Nanako's cognitive apprenticeship,

we must examine the activity of fan fiction writing, its relevant tools (e.g. the computer, Internet access, the website itself) and the locations in which participants exist. Within this nexus, the social context in which learning takes place is paramount. In schools, by contrast, students too often are asked to engage in disciplinary learning without having their skills, knowledge or experiences recognised, let alone validated.

In FFN, an out-of-school and online space, adolescents do have a genuine purpose that is dependent on shared understandings. Furthermore, FFN shows participants' personal investments in reading, understanding and responding, and how these have the potential to reconfigure power relationships. As Brown and Campione (1996) highlight, multiple voices participate in knowledge construction and distribute their expertise across the community of learners "at various levels of depth and personal investment" (p. 320). In doing so, differences among community members are legitimated and honoured. As a highly engaged adolescent on FFN, this experience was starkly contrastive with Nanako's school learning where her uncertainty and shyness often prevented active participation.

The guided participation that Grace fostered in her teen admirers exemplifies Vygotsky's (1978) concept of the social origins of individual psychological functions. Vygotsky's work was influential in shaping later work in distributed cognition, which Salomon (1993) defines as cognitive processes that are distributed across members of a social group. Pea (1997), contradicting the notions that Nanako's teachers had about her, elaborates:

"[I]ntelligence is accomplished rather than possessed. . . . I want to capture the important fact that intelligence, which comes to life during human activities may be crafted. There are both social and material dimensions of this distribution. The social distribution of intelligence comes from its construction in activities such as the guided participation in joint action common in parent-child interaction or apprenticeship or through people's collaborative efforts to achieve shared aims" (p. 50).

What Pea and others (Brown et al., 1993; Hutchins, 1995; Norman, 1993) are arguing seems significant to us as it has the potential to transform schooling and here, we argue, particularly transform literacy education in secondary schools. We speculate, on the basis of research conducted by Schieble (unpublished result) and others such as Black (2008) that if we can reshape human interactions with the tools, cultures and activities of teaching and learning in school, then we can reshape the identities and possibilities of students such as Nanako. Along the same lines, Pea (1997) posits that individual action does not exist in a vacuum. He states: "Our productive activities change the world, thereby changing the ways in which the world can change us. By shaping nature and how our

interactions with it are mediated, we change ourselves" (p. 57). For Nanako, FFN shaped her identity and her language abilities. However, as an active participant on FFN, Nanako also influenced the form and function of the wider community. In this paper, we are interested in how this same process plays out in secondary English classrooms.

Understanding literacy as a distributed process in the secondary classroom: theoretical scaffold

Teaching and learning have always been distributed across tools, such as books, pencils, chalk and classroom spaces. In this section, we focus on how digital tools impact students' interpretation of multimodal work. Here, we draw upon a *new literacies* framework in order to explicate the distributed nature of cognition in the classroom.

New literacies

For centuries, books have been the dominant form of textual representation, and literacy skills often continue to be measured by the decoding, comprehension and production of print-based materials. Lankshear and Knobel (2007) note that the book mediates "social relations of control and power, as between authors and readers, authorial voice as the voice of expert and authority, teacher/expert and student/learner. . . . Certain genres of texts were privileged over others and seen as appropriate within particular (institutional) settings" (p. 13). In the institutional setting of the traditional secondary English classroom, print has been the primary mode of expression. However, in a digital age that allows for multiple, multimodal and multifaceted textual representations (Coiro et al., 2008), we examine how the cognitive process of knowledge construction has changed. While literacy skills are still rooted in reading and writing, new literacy practices involve multimodal texts (Kress and van Leeuwen, 2001) that extend beyond print and foster distinct styles of engagement and practice.

A multimodal text contains multiple "socially and culturally shaped resources" (Bezemer and Kress, 2008, p. 171) that are tools that students can use to construct meaning. With digital technologies, students are not relegated to just books or other print text. Lapp et al. (1999) discuss the uses of multimedia in terms of 'intermediality', where students gain information across many different information sources, including movies, webs, group discussions, journal entries, video technologies, computer programs, social networking sites and gaming software. The reading and writing of multimodal texts involves new literacy skills such as

the ability to negotiate meaning across numerous texts or combine technologies to construct new meanings.

New literacy practices highlight the interaction within and between individuals, tools and spaces. Kress (2000) notes that the construction of meaning out of multimodal texts is based on the 'interested action' of the reader/writer (p. 155), and that "individual action and agency are brought together with the effect of social form and structure" (p. 158). As students actively interpret and use various resources in combination with each other, there is an increase in student choice, participation and agency. Additionally, with digital technologies, there is an increase in socially mediated practices that can occur in diverse spatial and temporal settings.

Lankshear and Knobel (2007) suggest that "[t]he more a literacy practice privileges participation over publishing, distributed expertise over centralized expertise, collective intelligence over individual possessive intelligence, collaboration over individuated authorship, dispersion over scarcity, sharing over ownership ... the more we should regard it as a 'new' literacy" (p. 1). In Black's (2008) descriptions of Nanako's participation on the FFN website, such new literacy practices are evident. However, new literacy practices are often relegated to out-of-school settings and viewed as inferior to the print-based, teacher-driven learning prevalent in schools. In the next sections, we focus on meaning construction through multimodal interpretation, and we suggest that participatory and collaborative new literacy practices can embody the idea of distributed cognition in the secondary English language arts classroom.

Interpretation

In a distributed theory of mind (Hutchins, 1995; Norman, 1993; Shaffer and Clinton, 2006; Wertsch, 1991), the cognitive processes of thinking and reading are circulated through individuals' interactions with each other and with a variety of tools. We can think of the representational modes available in a text as cultural artefacts that readers use as tools for interpretation and meaning production. In this case, reading involves the social use and interpretation of representational tools as part and parcel of conceptual thinking. This understanding of reading as a socio-cognitive process is meant to highlight the ways in which complex cognitive actions and various social resources are reciprocally and inextricably coupled.

With multimodal and socially mediated texts, our ways of interpreting meaning become more active, collaborative and distributed across multiple resources. The resources available for making meaning may include books as well as films, music, art, language and design. Moreover, in order to engage in

meaning-making activities with these texts, individuals must simultaneously 'read' a variety of modes of representation (Kress and van Leeuwen, 2001) and configurations of signs (Smagorinsky, 2001), which may occur in diverse spatial contexts (Leander, 2007).

Smagorinsky (2001) uses a social theory of distributed cognition to describe reading as the act of cultural mediation within an experiential space. While Black's work with fan fiction highlights an online, out-of-school experiential space, we propose that classroom teachers also can create such a space. Smagorinsky sees this experiential space "as a dynamic, permeable zone" where "meaning is a function of work conducted among readers and texts rather than between reader and text" (p. 141). In this frame of mind, the socio-cognitive processes of interpretation involve not only the tools of the text (the multiple modes of representation), but also the dynamic social practices at work within the experiential space where meaning is produced (e.g. the classroom or the chat room). For Smagorinsky (2001), then, "The text is thus the focal but not sole tool through which meaning emerges for the reader" (p. 141).

This is a theory of reading that, according to Lave (1991), "emphasizes the inherently socially negotiated character of meaning and the interested, concerned character of thought and action of persons-in-activity" (p. 50). As one draws on the social tools and signs available to interpret meaning, certain cognitive processes become 'one's own' (seemingly inner) private thoughts, when the process of interpretation itself necessarily draws on externally and socially mediated actions (Pea, 1997).

In this view of learning, the interactive social practices at work in the classroom – how the teacher finds materials, how the teacher and students jointly engage in meaning construction, how students in the class scaffold each other's knowledge – all serve as additional types of resources that students use to support their conceptual thinking. As Lewis (2007) points out, "[n]ew technologies afford new practices, but it is the practices themselves, and the local and global contexts within which they are situated, that are central to new literacies" (p. 230). Consequently, it is less about the tool per se, and more about the social practices of tool use, and the mechanisms that teachers can use to maximise the inextricable connections of a student's mind with the world of social activity, interpretation and meaning making. In the next section, we show how pre-service teachers enrolled in a course on teaching adolescent literature both enhanced adolescents' meaning making and interpretations of literature through tool use. However, we also illustrate how they, as beginning teachers, failed to take advantage of all opportunities to do so.

Case study: an analysis of online discussion in a secondary English classroom

We offer an example from a study of pre-service English teachers and adolescents' ongoing online discussions of young adult fiction to illustrate the theoretical concepts thus reviewed. The example functions as an ontological trace of the distribution of thinking across people, tools and spaces as they intersected as resources in participants' ways of making meaning with the graphic novel *American Born Chinese* (2006).

Research context and methodology

We draw on data from a case study that examined the ways pre-service English teachers and adolescents utilised online, multimodal resources in their discussions of young adult fiction in an online space known as Moodle, an open source, web-based software for creating virtual classrooms. As part of a course project, small groups of pre-service teachers used the tools afforded by Moodle to individually design virtual classrooms using images, colour and links to video and Internet sources and various other multimodal tools that personalised the experience. The research took place over three semesters from 2006 to 2008. Each semester, a different group of undergraduate pre-service English teachers enrolled in a class called Teaching Adolescent Literature at Lakeshore University (the names of all people, places and institutions are pseudonyms) in the Midwestern United States. In this class, the pre-service teachers interacted with a class of secondary-level students from a public school in Leigh Hills, a small suburb near Lakeshore University.

The pre-service teachers facilitated the adolescents' Moodle online activities (including Internet research, posting to a discussion forum and viewing relevant videos) to assist in their interpretations of a select young adult novel. Participation in the Moodle online space took place for 3 weeks at a mid-point in the semester; adolescents were required to complete all activities and post to the discussion forum a minimum of twice per week. When the project was completed and course grades were posted, a series of 1-hour focus group interviews were conducted with participants who volunteered to share their insights on the project.

Participants' postings to the online discussion forum and prospective English teachers' group and individual reflective papers were collected as data artefacts. During the 3-week teaching unit, prospective English teachers were required to keep a teaching journal that was copied and collected upon the project's completion. One-hour semi-structured focus groups were conducted with Leigh Hills' students and prospective teachers at the end of the semester (after grades had

been completed). Focus group interviews were audiotaped and transcribed. Interview data, student writing and online data were coded using inductive and deductive coding procedures (Graue and Walsh, 1998). Codes were used to generate themes to address the research questions.

We borrow from Wertsch (1998) and Shaffer and Clinton (2006) in selecting our unit of analysis as "agent-acting-within-mediational-means" (p. 284) within a framework of socio-cognitive and distributed theories of mind. Participants, as agents, each brought their own cultural resources to bear as they interacted with new literacies afforded by their participation in an online classroom. We argue that the technological tools leveraged in the space of each online classroom, such as videos, links to resources and text-based dialogue, also acting as agents, distributed some of the thinking for participants in how they made meaning with their respective texts. However, the interpretations afforded by these tools also were mediated by and distributed across participants' experiences in the world and cultural schemas as interpretive tools. Thus, we argue that interactions with technological tools as an answer to improving learning outcomes in the secondary English classroom is not unproblematic. The "agent-acting-within-mediational-means" must be carefully considered, with digital tools such as online discussion boards or video and audio sources viewed as but one 'mediational mean' within participants' complex and historied social practices.

Findings

The online discussion via Moodle that is the focus of this case study example was created for teaching the graphic novel *American Born Chinese* by Gene Luen Yang. In *American Born Chinese*, Yang (2006) weaves three storylines to explore the complexities of racism and identity on Asian American and immigrant youth. Through this case study, we highlight how intelligence was distributed across tools, texts, institutional spaces and participants' cultural schemas in the act of interpreting events from Yang's novel. In this example, the meaning-making process is shown as a complex activity distributed across multiple interpretive tools, rather than as an event solely taking place 'inside the head' of a single participant. First, we identify three key agents that acted as tools distributing some of the thinking in the interpretation of a select event in the novel. These three key agents are the teacher education programme where pre-service teachers were enrolled, multiple textual resources present in the online space and the cultural schema shaped by the community where the adolescents attended school. Then, we present one thread of discussion from the online discussion forum that serves as a "nexus of activity, tools and culture" (Brown et al., 1989, p. 40) where each of these agents interact and mediate one participant's interpretations of events in the novel.

Programme values as distributed tool

The teacher education programme where the pre-service teachers were enrolled may be thought of as one tool or resource that was integral to knowledge construction in the online classroom. The institution where the project was designed played an important role in shaping the framework of interpretation; thus, these values were distributed across and mediated by other tools in the social interaction. Lakeshore University's teacher education programme aims to educate teachers for diverse student populations. Through coursework and field-based placements, pre-service teachers are encouraged to be inquisitive about schooling practices and to examine whose learning needs are met and privileged through mainstream curriculum. In response, pre-service teachers read, write and discuss texts that challenge the traditional curricular status quo and learn to include texts that present multiple and non-dominant perspectives. These practices lie at the heart of a critical approach to literacy instruction (Comber, 2003; Larson and Marsh, 2005; McLaughlin and DeVoogd, 2004). Thus, the pre-service teachers' selection of *American Born Chinese* for this project was grounded in the programme values of their undergraduate institution.

Textual resources as distributed tool

The tools afforded by the online space made it possible for Gene Yang, the author of *American Born Chinese*, to act as a mediating agent in the interpretive event. In one instance, high school students watched visual images from an audio slideshow (made available by a US-based radio programme and posted on the Internet) in which Yang narrates how aspects of his life inform the creation of various characters and themes in his work. Through Yang's use of multiple modes of representation, the high school students were able to gain a deeper understanding of Yang's feelings of isolation and shame as an Asian American child who experienced little representation of his family's culture at school. Consequently, as the author of the graphic novel, Yang's message is distributed across the tools of the graphic novel, including the comic frames, images and words used to tell the story. Through the pre-service teachers' decision to link to this multimodal work via the online space – and to foster critical dialogue on its content – the high school students engaged in meaning-making activities with texts writ large.

Cultural schema as distributed tool

The focus group interviews provided insight into the students' cultural schemas and community norms, which served as tools that impacted their interpretations of the novel. Leigh Hills has undergone significant demographic changes in the past decade. Located within 20 miles of a mid-sized urban city,

Leigh Hills endured a rise in commercial business and expansive housing development from 1990 to 2000. Resulting migrations of middle-to-upper class professionals and their families shifted what was once a rural farming community to a more suburban setting. United States Census data from 2000 document that 97 per cent of the roughly 7,000 people in the community identify as white while 0.34 per cent of the population identify as black and 0.39 per cent identify as Hispanic or Latino. Less than 3 per cent of the total population residing in Leigh Hills lived below the poverty line in 2000. Two students, Sam and Violet, described the racial composition of their community, and the effects the population has on students' cultural schemas concerning matters of race, during the focus group interviews:

Sam: "There's not a lot of diversity in [Leigh Hills]".

Violet: "Everybody's white ...".

Researcher: "Can you tell me a little more about that, or like at the school, do you see that, how do you see that play out at the school?"

Violet: "There, I think there's [pause] a fair amount of racism, especially among the boys, um, a select group of boys, though, because, you know I think part of it is that they just don't know it ... I think the only way you can really hate something is by not understanding it or not being around it".

Sam: "We haven't grown up with that type of thing".

Violet: "Right, so, there's probably less than 5% of our school is not white, I would guess".

As conceived by these adolescent members of the community, race plays a factor in the social dynamics among students at the school. Violet suggests that racism and derogatory language is a practice among what she names as a small group of boys that behave in this way largely due to their own ignorance. Lewis et al. (2001), in a study of racial dialogue around young adult literature with teachers in a small, rural community that they describe as "lacking in racial, ethnic, or linguistic diversity", assert that white students in such communities "rarely examine their own whiteness as a racial category, confront difference, or experience cross-cultural commonalities" (p. 318). Violet narrates the community as a place that has offered her peers little opportunity for critical self-reflection on their own racial identities. Next, we show how one adolescent participant fails to understand one of Yang's character's actions, and how the pre-service teachers do *not* take advantage of this teachable moment to help him see beyond his own white and middle-class understandings of this character's predicament.

An interpretive event: using distributed cognition for meaning making

One of the three stories threaded throughout *American Born Chinese* is that of Jin. In the third grade, Jin and his

family moved from an apartment near Chinatown in the San Francisco area to a predominantly white, middle-class American suburb. Jin recalls painful experiences with his third grade teacher mispronouncing his name and introducing him as moving “all the way from *China!*” (Yang, 2006, p. 30, emphasis in original), taunts from peers that “Chinese people eat dogs” (p. 31) and for eating dumplings for lunch. Suffering from the “stereotypes and prejudices of his peers and teachers” (Blasingame, 2007, p. 99), Jin turns away from his home culture at school. In the fifth grade, when Jin’s eventual best friend Wei-Chen Sun moves to the area from Taiwan, Jin recalls that “something made me want to beat him up” (Yang, 2006, p. 36). In this frame, Jin is pictured as seated with his white classmates, with a frown and air of disdain for Wei-Chen. Eventually, their love for toy robots sparks a friendship.

Now in the seventh grade, as the storyline resumes, Jin falls in love with his classmate, Amelia. Amelia is white, blonde and blue-eyed, and Jin narrates that “it made me nervous that someone could have so much power over me without even knowing it” (p. 88). In one scene, Jin asks Wei-Chen, and Wei-Chen’s girlfriend, Suzy Nakamura, if they think that Amelia likes Greg, another white, curly blonde-haired and blue-eyed classmate. Wei-Chen and Suzy tease Jin for being jealous over Amelia; their light teasing is brought to a halt, however, as two white classmates walk by and sling the racial slurs ‘chink’ and ‘gook’ towards them. The following frames depict Jin walking home from school after being called a ‘gook’ and a ‘chink’ by his white classmates. As he is walking, he thinks about Amelia and Greg talking, and the final frame portrays Jin ascending the stairs of his home, with a picture of blonde, curly hair as his final thought. This set of frames marks a pivotal point in Jin’s storyline, as we later find out that Jin curls his hair, and this act gives him ‘a jolt of confidence’ (p. 105) to ask Amelia on a date.

In this instance, two pre-service teachers used the online discussion forum to draw students’ critical attention to this key moment in the story:

“On page 97, there is no text; close read the images. What do you learn about Jin? Do the pictures further the plot? What do they say about Jin’s sense of alienation? Refer to specific things, such as color, expression, etc.” (Discussion forum, 13 April 2008).

Here, the teacher education programme’s encouragement to examine marginalised viewpoints, such as Jin’s feelings of alienation and struggles living and attending school in a mainstream environment, are distributed in the question posed. The following is a response from one high school student, Patrick, to this question:

“On page 97 Jin thinks that he would have a better chance with Amelia if he just curls his hair so he looks more like Greg. This influence of Jin’s self-image by Greg’s appearance seems unhealthy. He should just be himself and hope that Amelia will like him for who he really is” (Patrick, 24 April 2008).

Patrick’s posting is, we argue, an example of the cultural schema of his community intersecting with and mediating the other agents that have distributed some of the thinking in this interaction. Having had few experiences of cultural alienation in his own community, Patrick interprets Jin’s feelings as ‘unhealthy’ and as a matter the individual must overcome. Despite the thinking distributed by Gene Yang’s comic images and words, the audio slideshow and the teacher education programme values, Patrick’s cultural schema acts as an interpretive agent distributed across the other factors and mediates Patrick’s interpretation of Jin’s feelings of alienation. This, in effect, mitigates influences of whiteness, race and power in the example from the text.

Conclusion and implications

Theorising this example from the standpoint of distributed cognition informs teachers of the impact that instructional tools have on any interpretive event. From this example, we see that Patrick’s cultural schema was a powerful tool in his interpretation of this key event in the novel, despite the text and digital tools brought to the teaching moment. What these pre-service teachers do not do is take advantage of Patrick’s posting to continue the discussion and ask further questions of the adolescent group. What we need to recognise here is that these pre-service teachers also are learners and require ongoing mentoring in how to conduct such questioning. In this case, the university instructor might have brought a transcript from the discussion forum and used it to brainstorm with the pre-service teachers how they might have elaborated their questioning further or interrogated their own cultural models regarding race and identity. In doing so, the transcript could become a tool to facilitate cognitive apprenticeship on two levels: one for the university instructor to use with the pre-service teachers, and second, as a tool for the pre-service teachers to reflect on their practices.

Unlike the tools available in traditional classrooms, an online discussion space or FFN website acts as a catalyst for a distributed theory of mind. In traditional schools, with an emphasis on taking standardised tests, the learning environment is designed on the view that learning is a transaction that happens solely ‘inside the head’. Unfortunately, this pushes many students to the margins of classroom engagement and participation. Left alone to learn, Nanako and others like her often fail to meet teachers’ expectations or state

and federal policy mandates. Meanwhile, those students whose cultural schemas closely align with those of teachers, administrators, test designers and policy-makers often continue to excel.

In this paper, we support the notion that “distributed cognition proposes that knowledge resides in people, in tools, and in cultural settings in which people interact with tools; it is not locatable extensively in the heads of individual persons or in the design of specific artifacts” (Shaffer and Clinton, 2006, p. 288). We argue that students can be successful readers and writers when they take on the role of cognitive apprentices to knowledgeable others who scaffold their participation in meaningful activities and guide their use of tools in settings where they are respected. In the example of an online discussion forum, participants were able to read, reread and reflect on their peers’ archived thoughts about events in the novel. Internet sources, such as Gene Yang’s narrated slideshow, allow for the author’s perspective to span space and time, and in a sense participate in the interpretation process. In effect, participants were able to consider multiple viewpoints (including the author’s own) in how they interpreted events in the novel. The technological tools afforded by online spaces bring together distributed resources and allow for meaning to be created beyond the resources available by any one community, institution or person.

However, as Patrick’s comments regarding Jin’s curling his hair suggests, a skilful teacher or knowledgeable other is required to mediate the multiple tools, social context and cultural schemas interspersed across any literacy event. In this paper, we ask how distributed cognition might be enacted in literacy teaching and learning, and what these intersections might highlight for us about meaning making. Approaching literacy teaching and learning from the standpoint of distributed cognition makes clear, in Patrick’s case, the importance of social context and students’ lived histories in interpretations of text. Considering literacy learning from this viewpoint, teachers must strive to create and enact social experiences that apprentice and diversify students’ cultural schemas towards the goal of critical awareness. From the view of critically understanding race and identity as institutional, rather than a matter for the individual to overcome, teachers can leverage technological tools to bring students with multiple backgrounds and cultural schemas into the discussion. For example, students whose lived histories involve being marginalised from school curriculum and isolated in their communities may have distributed a wholly different line of thinking to the pre-service teachers’ critical question – one that views Jin’s isolation not as a matter for the individual to overcome, but partly as a result of societal and material constructions of whiteness as the desired norm. Considering the discourses that dominate the classroom or community as distributing some of the thinking in any literacy interpretation allows teachers to recognise a

need for further cognitive apprenticeship and to consider the multiple resources at their disposal for doing so. Examples might include teaming up with another classroom of students using web-based discussion tools, e-mail, video or audio technology to shape and diversify human interactions with text. As such, these interactions change the very nature of communities and permeate discourses. Distributed theories of mind provide conceptual tools for teachers to consider crafting teaching and learning environments that are strategic in distributing multiple and diverse perspectives.

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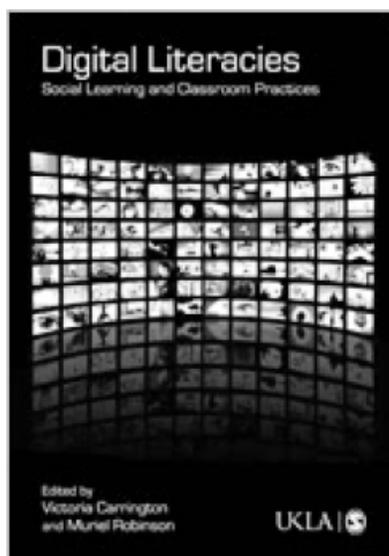
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Digital Literacies: Social Learning and Classroom Practices

Victoria Carrington and Muriel Robinson (editors)



Facebook, blogs, texts, computer games, instant messages... the ways in which we make meanings and engage with each other are changing. Digital technologies are an everyday part of life and this book explores the ways in which they can be used in schools. The editors provide an insight into the research on digital technologies, stressing its relevance for schools and suggest ways to develop new, more relevant pedagogies, particularly for social learning, literacy and literate practices. With a practical focus, the examples and issues explored in this book will help teachers and students analyse their own practice and carry out small-scale research projects. Explaining the theoretical issues and demonstrating their practical implementation, this topical book will be an essential resource for all involved in literacy teaching.

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