

BLOGGING AS CHANGE

Transforming Science & Math Education
Through New Media Literacies



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The Focus of This Book

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What the Book Is About and Why We Wrote It

New media literacies have already “disrupted” the way many of us do life as we text our kids, “friend” our colleagues on Facebook, and blog photo documentaries of our family adventures for grandparents. This book seeks to explore to what degree these practices have, can and maybe should “disrupt” the ways we learn and teach.

Specifically, this book illustrates and critically analyzes the potential of blogging to invite and encourage *students* and *teachers* to engage in unique ways of communicating, interacting, learning and thinking *in science and mathematics education*—possibly the most unlikely school contexts one may think could be affected by new media literacies. Grounded in empirical data of math and science students’ and teachers’ blogging in a variety of contexts, the book will examine the affordance offered by *specific blogging practices* to transform science and mathematics classrooms into places that nurture new and more authentic forms of participation for all stakeholders (students, teachers and significant others), as well as the conditions needed to realize these affordances.

What is *blogging*? Technically speaking, blogging involves the authoring of a series of posts or entries, usually related to a given theme, constructed by a single author and organized in reverse chronological order. While the end product, a blog, looks like a website, it is full of personally authored work that serves purposes of knowledge building, identity formation, community building and/or advocacy work. Figure 1.1 offers a screenshot of a blog post. The language is often less formal than an essay or a research article, and more formal than a diary or chat box. The posts, often written in narrative form, are complemented by collections of multimedia, such as images, podcasts and video. Blogging also involves intentionally relating one’s stories and thoughts to others’ through the use of hyperlinks that explicitly connect and define or describe relationships with other places/spaces/voices on the Web. And because it is public (or at least intentionally shared), it invites participation from others.

As a different form of literacy than typically found in schools or among teachers, blogging invites a new form of participation in a given discourse—in this case, learning and teaching.

Figure 1.1. Blog screenshot

This book reports and synthesizes the results of the authors' experiences with blogging as practitioners and researchers in science and math education over the past five years. These experiences have confirmed as well as complexified our understandings of the potential of blogging to support very different forms of learning engagement for all those involved—different in that all participants can be producers as well as consumers of knowledge, ideas can be highly connected and interconnected across places and time, narratives can relatively seamlessly merge the personal and the professional, and multiple and varied modalities can be used for communication including images, video, audio as well as text—as suggested in the literature but rarely verified empirically. Furthermore, these experiences have shown us that these new forms of engagement can result in valuable learning for both students and teachers.

The possibility of using new media literacies like blogging in math and science classrooms may seem counterintuitive at first, as traditional math and science instruction (which is *far too* common in classrooms today) is characterized by instruction where the teacher presents information and procedures that students are expected to memorize and reproduce—a model that represents few of the values listed above. In contrast, however, math and science professional organizations have been calling for a very different approach to classroom instruction, one that aims at developing conceptual and deeply connected understanding of key mathematical and scientific ideas, a thoughtful and critical appreciation of the nature of mathematics/science, the ability to productively engage in math/science

inquiries and discourse, as well as confidence and interest as learners of mathematics/science. In turn, these new learning priorities call for experiences that engage learners centrally in their own learning, elicit and explicitly build on learners' individual prior understandings, skills and creative expressions, capitalize on social networks to support interpretation and meaning-making, and engage learners centrally in the authentic and core practices of the discourse (e.g., National Research Council [NRC], 1996; National Council of Teachers of Mathematics [NCTM], 2000). For brevity, in this book we will refer to this set of principles and practices as “reform-based teaching” or “reform-based” more simply. Such an approach clearly represents a paradigm shift when compared to the traditional, transmission model of math and science learning most of us have experienced as learners. It also has a lot in common with new media literacies—a theoretical framework we use to examine and understand blogging and its impact—as discussed briefly below and further elaborated in Chapter 2.

The new media literacies (NML hereafter) literature is a broad set of conversations that redefines literacies as not merely that of reading and writing but rather focuses on the meaning being made and the practices surrounding that meaning making. More specifically, NML focuses on skills and practices that capitalize on the affordances of emerging Internet-based networking technologies such as blogs, wikis and social bookmarking (often referred to as “Web 2.0 technologies”) to both consume *and produce* new knowledge within social communities. Key to NML includes a focus on collaboration, distributed expertise and authority, and collective or shared knowledge (Lankshear & Knobel, 2006). Yet, Bill Cope, Mary Kalantzis and Colin Lankshear (2005) warn us that it is not blogging, or any other new Web 2.0 technology per-se, that afford these new forms of participation, but rather *how* these technologies are employed by specific users in a specific context:

The thing about all these technologies is that any device which gives human beings another capacity to communicate increases their capacity to do good things and to do bad and silly things. Technology doesn't drive it. It just opens new possibilities, new depths and new shallowness... Like all technology, it just opens up human capacity to do things better and to do things worse. (p. 203)

In other words, while the tool may provide the means, the students *and* teacher using the tool construct meanings that are dependent on the ways they choose to put these tools to use. Both the specific ways a teacher designs classroom blogging to support learning *as well as* the various ways students choose to take-up or engage with and even change these activity structures, will determine the actual learning outcomes realized by the class (e.g., DeGennaro & Brown, 2008; Luehmann 2008a; Luehmann & Frink, 2011).

So, we've heard this "transformative" talk before, right? New technology will transform school learning to be more engaging and effective—we heard that talk with respect to movies, the computer, the Internet, even the textbook. But, these and other revolutions have consistently been integrated within the common transmission paradigm of teaching and learning—rarely capitalizing on the opportunities that any of them affords for collaborative, authentic learning that students have a significant voice in directing. If these new media literacies such as blogging have any transformative hope, we need to see examples of transformative practice going on in real classrooms.

The following two vignettes are real-life examples of, and thus sources of inspiration for, the potential richness as well as variety of affordances that blogging can offer to education:

Vignette 1. Mr. K., an eleventh grade pre-calculus teacher, feels his students need more time with the concepts they are working on in class, and decides to capitalize on students' interests with the Internet by integrating blogging into daily classroom practice. Each day, a different student is expected to "scribe" the day's lesson in her own words and, thus, collectively, the class would be "constructing a textbook for the world." Though no specific guidance is given, students quickly take up the practice with fervor—posting warnings, reminders, elaborate graphs and diagrams, inside jokes as well as apologies for imperfections—all addressed to their peers. Though most students shared an initial skepticism about blogging, they unanimously described their ultimate dependence on the blog for understanding the course content and participating successfully in class. They also described its contributions to the development of community and shared ownership in each other's learning. Though the teacher did not introduce it with such lofty goals, the lived classroom blog transformed how students engaged with the concepts and participated in their own meaning-making around mathematics. (See <http://pc30s.blogspot.com> for one of this teacher's many classroom blogs and Appendix A1 or <http://oletango.blogspot.com/2006/01/what-if-your-blog-was-gone.html> for his students' perceptions of their blogging experiences.)

Vignette 2. "Ms. Frizzle" (as she refers to herself), a progressive-thinking and passionate middle school science teacher, finds herself working in an alternative school in the Bronx where she is the only science teacher—and therefore the only teacher in her school trying to implement student-centered, inquiry-based science instruction

as a means to empower her historically marginalized, poor, urban students. Only three years out of graduate school, she has passionate commitments and creative ideas, but also many questions about how to engage *her* students centrally in their own science learning in ways that transform their identities including, but not limited to their school science identities. She turns to blogging as her primary means to “think on paper” and engage with a like-minded professional community. She posts regularly (3–4 times a week) with stories of her daily adventures filled with wonderings, commentaries on resources she found useful, “rants” consisting of passionate and well-supported arguments about pedagogical dilemmas and social justice issues, and requests for support and help. A blogging community soon develops that provides Ms. Frizzle with encouragement, resources and collaboration, thus transforming her professional learning. (*For a sample of Ms. Frizzle’s blogging work, see <http://msfrizzle.blogspot.com/>.*)

Both of these real-life examples suggest that blogging, as well as other literacies enabled by social networking technologies, can indeed play a key role in implementing the vision for math and science education agreed upon by many professional organizations, but rarely a reality in schools. They also point out two quite different—yet both valuable—forms of blogging we chose to focus on in this book:

- (1) *Classroom blogging* (like the one in the first vignette), the outcome of which can literally be co-constructed by both teacher and students. These new forms of practice afforded by classroom blogging can be used as a vehicle to establish new modes of operating within the classroom so as to create a community of learners who are productively engaged in science/math investigations and meaning-making in ways and times that extend well beyond the tight constraints of the physical classroom and class schedule.
- (2) *Teachers’ personal professional blogging* (like the one in the second vignette), which can be used by an individual teacher to support and improve their instructional understandings and practices consistent with a reform-based vision through connections to like-minded peers that extend beyond the barriers of the school building.

This second use of blogging to support teacher learning, while perhaps less intuitive as a tool to promote reform-based math and science education, is equally as important as classroom blogging, as introducing either a reform-based or NML mindset to the classroom culture holds significant challenges in the socio-cultural and historical contexts of schools and schooling. As Mary Kalantzis pointed out in her dialogue with Cope and Lankshear (2005)