

*The Materiality of Learning: Technology and Knowledge in Educational Practice. Series: Learning in Doing: Social, Cognitive and Computational Perspectives.*

Estrid Sørensen.

New York: Cambridge University Press, 2009, 224 pages

Reviewed by: Catherine Adams  
University of Alberta

The modern practice of schooling is and always has been inextricably intertwined with its materials: from Froebel gifts, Montessori object boxes, and Waldorf architecture, to Madeline Hunter's lesson plan format, the Blackboard learning management system, and Smart Technologies' Interactive Whiteboard. The particular technologies teachers use in the classroom appreciably shape and "influence the formation of learning and affect thinking and theorizing about education in general" (Sørensen, 2009, p. 7). Yet the formative significance of materiality to the social project of education has received surprisingly little theoretical attention. Waltz (2006) points out that "this is especially curious given the serious work that has gone into the development and use of things as educational tools" (p. 52). Even educational technology literature has remained relatively immune to the work of science and technology studies (STS) and Actor-Network Theory (ANT) scholars who, for example, observed early that technologies are often unfaithful to their creators and thus produce unanticipated effects beyond the (educational) aims intended. Estrid Sorensen's (2009) *The Materiality of Learning: Technology and Knowledge in Educational Practice* offers one corrective, methodological step toward addressing this theoretical deficiency, reframing "learning not as social but socio-material" (p. 5).

Sørensen's book is a reworking of her 2005 dissertation, which examined the contribution of learning materials in constituting school practices in two Scandinavian grade 4 classrooms. Using an ANT-informed ethnographic approach, she observed teacher-student interactions "performed" with, around, and through a variety of established technologies—blackboard, chalk, notebooks, chairs, a bed-loft, and a bell—as well as several new media technologies—a blog, a conferencing system, and an online virtual environment called *Femtedit*. Sørensen's intent is to provide a methodological approach to studying the materiality of learning in order to discover "how digital and traditional learning materials influence educational practice in general, and

---

Catherine Adams is an assistant professor in the Department of Secondary Education. Drawing on phenomenology, philosophy of technology, and critical media scholarship, her research investigates changes in teachers' practices, students' learning approaches, and knowledge representation in the wake of digital technology integration.

how they contribute in particular to shaping different forms of knowledge and varieties of presence" (p. 8).

The book is divided into six chapters, each homing in on a methodological insight or "lesson" emanating from Sørensen's ethnography. Chapter 1, "A Minimal Methodology," introduces Helen Varran's (1998) notion of imaginaries as a key heuristic for nudging participants' "performative or enacting mode of knowing" (p. 15) to the forefront of inquiry. "Minimal methodology" is Sørensen's first lesson, signaling her move from a humanist to a post-humanist position: the researcher turns away from the participants as individuals (teachers and pupils) and follows instead participation or performance, attending to how humans and nonhumans (blackboard, chairs, online environment, etc.) take part in educational practice.

In Chapter 2, "Components and Opponents," Sørensen takes issue with historical and contemporary descriptions of technology in educational contexts. She says these accounts "shift between describing software functionalities and user's application of these functions" (p. 30), systematically separating the material from the social aspects of technological practice and thus render a universalized, decontextualized vision of technology use in schools. Sørensen then describes the construction of the virtual learning world called *Femtedit*, tracing its design and arrival in the classroom as an object of research. Her account serves to "destabilize the widespread account of technology as stable singular tools separate from and under the control of human beings" (p. 33) and becomes the occasion to introduce some classic ANT notions such as heterogeneities, hybrids, and cyborgs. The second methodological lesson offered here is the need for two terms to distinguish between the material and the socio-material:

I let material stand for an entity that has achieved a purified nonhuman character, and I let materiality refer to the achieved quality of a hybrid that allows it to relate to other parts. Thus, the notion of materiality applies to social as well as material parts. (p. 61)

Sørensen speculates that postsocial theory will eventually flourish and the term *material* will become superfluous. Meanwhile, she is satisfied that the two terms—*material* and *materiality*—serve to draw sufficient attention to the "tangible, material things that surround us in learning and educational practices" and sensitize the researcher to the construction of social relations through, with, and around "things."

In Chapter 3 "Forms of Technology," Sørensen develops her spatial approach to inquiry. Her interest is to investigate beyond the description of socio-material relations toward an account of the patterns of relations that assemble and unfold in practice. She draws especially on the "after-ANT" work of John Law and Annemarie Mol, who expand the classic ANT spatial imaginary, the network, to consider regional and fluid formations. Sørensen reveals the *Femtedit* virtual environment as a fluid, mutable relational pattern, while simultaneously performing a more stable network structure: it is, she says, multiple. Her third methodological lesson, "spatiality," involves recognizing that materiality is not only relational, but a multiplicity of entangled relations that form spaces.

In Chapters 4 and 5, Sørensen explores two “performative effects” of how technologies participate in school practices: forms of knowledge and forms of presence. Building on her spatial analyses, she distinguishes diverse forms of knowledge by their particular spatial formations or performances. Beyond representational knowledge, she identifies communal knowledge—knowledge that performs a resonance (a feeling of interconnectedness) space—and liquid knowledge—“an ongoing process of parts and relations” (p. 136). Unlike representational knowledge, these latter two forms do not create boundaries between the individual and others in the knowledge space. The Chapter 4 lesson: while (digital) technologies in schools are typically expected to enhance learning, it is better to “ask how this technology may change learning, what form of knowledge it may contribute to performing, what methods of validation will be, and, by the end, what are the criteria?” (p. 136).

Sørensen then turns to analyze school technologies in terms of presence, that is, “the way in which humans *are* with materials, contrary to how humans *make sense* of materials—or how they make sense of themselves with the help of materials” (p. 138, my italics). By way of example, she unfolds the attentional draw and spatial imaginaries of the blackboard. Sørensen’s descriptions of the regional patterns of relations performed in and around the blackboard are particularly compelling and recognizable and lead to an insightful discussion about negotiated boundaries (regions) and authority in the classroom. She then returns to the Femtedit virtual environment, where she had observed a different quality of teacher-student relation, characterized initially as one teacher’s “restlessness” as he moved from one child’s computer station to another. As she works through the virtual learning environment example, she uses the term *discontinuity* to describe the variety of separations performed in this fluid spatial formation. Ultimately, Sørensen arrives at a posthumanist understanding of presence and authority. Lesson five: “in order to grasp the materiality of learning, we must describe a particular learning practice as a pattern of relations of human and nonhuman components, and we must characterize the way in which humans are present in this practice” (p. 176).

In her final chapter, Sørensen declares that she is finally positioned to “define the materiality of learning as the achieved ability of a growth in knowledge to connect to other entities” (p. 193), which she suggests is essentially “learning transfer.” At this concluding juncture, such a simple characterization of learning may seem unsatisfying. However, her main point is not so much to arrive at a stable definition. Rather, her primary concern is articulating methodology sensitive to how humans and their learning materials perform educational practices, and based on this newly acquired sensitivity, how we might begin to “challenge, reimagine, and rearrange” current knowledge forms and learning spaces.

#### Reference

- Waltz, S. (2006). Nonhumans unbound: Actor-Network Theory and the reconsideration of “things” in educational foundations. *Educational Foundations*, 20(3/4), 51-68. Available: <http://vnweb.hwwilsonweb.com/hww/Journals/getIssues.jhtml?sid=HWW:EDUFT&issn=1047-8248>