

## **Using Teaching Routines with Classroom Network Technology to Support Improved Classroom Assessment** *Bill Penuel, Angela Haydel DeBarger, and Patricia Schank, SRI International*

**Question(s) for Discussion:** How can we prepare teachers to make the most of classroom network technology to support improved assessment?

**Session Description:** This session will introduce participants to and engage them in the use of strategies to help teachers make the most of a classroom network technology, Group Scribbles, to support improved classroom assessment in middle school Earth systems science. Group Scribbles enables students and a teacher to scribble contributions on sheets similar to Post-it notes and to jointly manage the movement of these electronic notes within and between public and private spaces. Using Group Scribbles, a classroom can enact a wide range of cooperative activities with content ranging from simple sketches and annotations to mathematical symbols and more elaborate concept maps. With Group Scribbles, students are actively involved in both contributing and responding to content as well as managing shared visual spaces. Because Group Scribbles is a flexible medium based on a simple and familiar metaphor, teachers and students feel more comfortable in inventing their own forms of participatory engagement.

To support teacher invention with Group Scribbles, the Contingent Pedagogies Project has devised a set of teaching “routines” intended to support improved classroom assessment with the technology. Routine refers to a sequence of interaction that is repeatable, becomes automatic to teachers and students, and creates norms for interacting with subject matter. We use the qualifier “teaching” because we see good classroom assessment as seamless with instruction (National Research Council, 2001a). The idea of a teaching routine is similar to what other computer-supported collaborative learning researchers have proposed as “collaboration design patterns” (DiGiano, et al., 2003), though we intend these as resources for teacher-led, rather than researcher-led, design. Each routine defines a sequence of teaching moves, supported by classroom network technology, that, when used as a sequence, addresses three goals: (1) to increase student opportunities to communicate with the teacher and with peers about their thinking; (2) to motivate students to participate and learn from lectures, investigations, and readings; and (3) to provide feedback to inform the teacher about how to adjust instruction. There is a strong basis for adopting these goals in learning-sciences research (Bransford & Schwartz, 2000; National Research Council, 1999, 2005) and research on classroom assessment (Black & Wiliam, 1998; Brookhart, 2007; Crooks, 1988). At the same time, we know that many classroom practices today do not advance these goals, even when high-quality curriculum materials and technologies are in place (National Research Council, 2004; Reiser, et al., 2000). When narrowly focused on promoting adoption of innovations, even professional development of an extended duration can have a limited effect on student learning opportunities (Gallagher & Penuel, 2009). A key challenge is to develop tools beyond curriculum and infrastructure that can help teachers overcome obstacles to meeting these goals and that can serve as a resource for adaptation and invention.

In this session, we will illustrate how teaching routines are being embedded in assessment activities developed for the *Investigating Earth Systems* (IES) curriculum. The session will be interactive, with the opportunity for participants to engage as students in activities that use routines.