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Moving Beyond 'Clickers': New Tools for Participatory Learning

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Moving beyond 'clickers':
New tools for participatory learning

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If you have used clickers or know about their use to create a more participatory atmosphere in classrooms, then this session will offer something unique for you. While clickers (or Classroom Response Systems - CRS) have made it possible for instructors to introduce a new emphasis on formative assessment and interactive engagement in the classroom – they have inherent limitations.

This session will explore the use of Group Scribbles, a new software tool that embodies many principles of sound pedagogy and provides a rich pathway for capturing data from classroom assessment tasks (CATs). This session will engage you in thinking about new ways (across disciplines) in which you can make your students' thinking visible. Please bring your laptop or Tablet PC (with Adobe Flash) for a full interactive experience.
Overview

• The Challenge
  – Create a learning environment based on *How People Learn* principles
  – Knowledge centered
  – Learner centered
  – Assessment centered
  – Community centered

• The context – Wireless classroom
  – Heterogeneous devices – laptops, tablets, handheld devices

• Real world constraints
  – People, devices, learning activities

*How People Learn*, Bransford et. al., National Research Council, 2000
The HPL-inspired learning environment:

- **Knowledge** centered
  - Rich content related to your discipline

- **Learner** centered
  - Make student activity a prominent feature ("They don’t just sit there!" – Dean Zollman, Kansas State University)

- **Assessment** centered
  - Opportunities for continuous formative assessment
  - For both students and instructors

- **Community** centered
  - Social networks: of people and devices
  - Collaborative groups

- **Groups of learners and their teachers routinely work in more complex configurations than in traditional lecture-based classes in such an environment**
How about Clickers?

What are they good for?
…

What is the pedagogy?
…

What are their limitations?
…
Get Beyond Clickers

Look for solutions with the following characteristics:

Satisfy Technological Needs

Support Pedagogical Qualities
Use computation not only to support dynamic representations related to cognitive processes but also to support the dynamic coordination of discourse and participation.
Technological needs:

- **Latecomer tolerance**
  - Late arriving devices/users can catch up easily

- **Robust across dropped connections**
  - Guarantee smooth activity participation (but not necessarily guaranteed transmission/receipt)

- **Support disconnected mode gracefully**
  - Students work offline, submit work later

- **Discovery paradigm**
  - Simple means to find sessions, activities
Pedagogical Qualities to be supported:

A. *Positive interdependence and individual accountability*
   Every student individually accountable for some portion of the task
   Overall goal requires all students’ contributions

B. *Role specialization*
   Students encouraged to focus deeply on one dimension of teamwork at a time

C. *Even-odd tolerance*
   Applications must address possibility that “extra” students may be assigned to a group.

D. *Support for differential rates of completion.*
   Some students work faster than others and can be disruptive if they have nothing to do but wait
Typical Classroom Assessment Tasks

- Background Knowledge Probe
  - Preconceptions, Reading checks
- Think-Pair-Share
  - Discuss with a peer
- Ranking Task
  - 6 to 8 different variations of a scenario/quantity
  - Student needs to solve each one and rank the scenarios from greatest to least
  - E.g. Fractions
- Move between representations
  - E.g. Symbolic & Visual molecular views (Chemistry)
Group Scribbles v 1.0

- Public Board
- Private Board
- Label Pad
- Scribble Pad
- Scribble Sheet
- Drawing Tools/Supplies
Ranking Task activity used in introductory physics class.

The object of the activity was for students to determine the strength of the electrostatic force at the point P due to various pairs of charges.

Originally devised as a pencil and paper activity and adapted to the collaborative space of GS.

The “solution” is to arrange the sheets from left to right based on how strong the net force would be.
Let’s see GroupScribbles 2.0

• Requires a Web browser with Adobe Flash
• A special Web server software that can run on a laptop or on any standard computer
• Ideal for use with Tablet PCs but works well with laptops and desktops.
• Multiplatform – Mac or PC
• To access the software (see the last slide)
One view of the public board – zoomed out to show general arrangement
Zoomed in view of the same public board
View of same public board as in previous slide, ‘masked’ by teacher to preserve anonymity of submissions
View of public board with background graphic loaded on which student has inserted a ‘label’ and a text annotation (see center).
Access & Acknowledgements

• **Overview:** [http://groupscribbles.sri.com/](http://groupscribbles.sri.com/)
  – Download the software
  – Download publications
  – Access the Community Wiki
  – We welcome contributions

• **Acknowledgements**
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