Interactive Whiteboards and Collaborative Pupil Learning in Primary Science

Project contacts
Neil Mercer: nmm31@cam.ac.uk
Paul Warwick: ptw21@cam.ac.uk
Ruth Kershner: rsk21@cam.ac.uk
with Judith Kleine Staarman:
J.Kleine-Staarman@exeter.ac.uk
http://IWBcollaboration.educ.cam.ac.uk

IWB systems comprise a computer linked to a data projector and a large touch-sensitive electronic board displaying the projected image. Children or teachers can manipulate objects on the screen directly by hand or with a stylus. Effectively, the IWB is a digital hub, through which other technologies can be channelled, as orchestrated by the teacher and the children.

Research in the UK has focused on IWB use in teacher-led sessions, attending mainly to the nature of teacher-pupil interactions and the motivational effects on children. This project builds on this work by addressing the relationship between:
• The affordances of the IWB
• Children’s collaboration and dialogue
• Children’s learning in science
• The mediating role of the teacher

Our exploratory research question was ‘How do children use the IWB when working together on science-related activities?’

The project
• Data collection over one school year
• 6 primary schools, 12 teachers (2 in each school)
• UK Year 4/5 – ages 8-10
• 3 science lessons (2 consecutive) – total of 36 lessons
• Observational data - video (lessons); audio recordings (interviews); teachers’ reflective assignments and notes

Analysis
• Identifying ‘learning episodes’ of several minutes as initial units of analysis
• Further detailed analysis of talk and interaction within and beyond learning episodes
• Building a research narrative for whole lessons linking IWB affordances, collaboration and dialogue, science learning and teacher mediation

Conclusions and implications for practice
The IWB provides both a tool and an environment that can encourage the creation of a shared dialogic space
if
• there is active support from the teacher for collaborative, dialogic activity in the classroom
• the teacher devises tasks that use board affordances to promote active learning and pupil agency. For example:
  A series of cumulative tasks, the pace of which can be controlled by the children (e.g. reviewing previous learning)
  Open-ended tasks (e.g. sharing initial topic ideas)
  Science investigations (e.g. data interpretation, considering experimental design and variables)
  Tasks integrating web-based materials (e.g. using web-based simulations and video resources)
• the participation structure is flexible enough to accommodate developing pupil and teacher expertise and expectation.

but
• wider constraints may apply, such as when there is a conflict between group learning and the need to assess individuals
• individual circumstances may combine and intervene, such as technical capability and self-efficacy.

On the centre page our model of collaborative learning at the IWB shows:

Researching interactive whiteboards (IWBs) in primary classrooms
Children’s active participation through exploratory talk

Exploratory talk is that in which we can hear questions, reasons, talk being used as a tool for thinking together. It is characterised by such phrases as:

- what do you think…? why…?
- I think that…..because…
- if……but…..I know…
- shall we…?

Children talking about food chains, with features of exploratory talk:

S1: Well actually, no … what about if we put that there, that could…
S1: That could be eaten like that.
S2: Oh yeah.
S1: Because they, they basically all have the same habitat and so do they. But the water spider can probably eat that, and then.
S3: Maybe we could swap it round.
S1: No that’s.
S2: Why was the spider…?
S1: Do you all agree with that?
S3: Do you agree with that yeah?
S2: Yeah.

See also
http://thinkingtogether.educ.cam.ac.uk