



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

- the creation of a shared dialogic space
- knowledge building that derives from interactions and co-construction
- the support of certain linked elements:
IWB affordances,
teacher mediation,
children's active participation,
classroom participation structures.

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.



Researching interactive whiteboards (IWBs) in primary classrooms

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

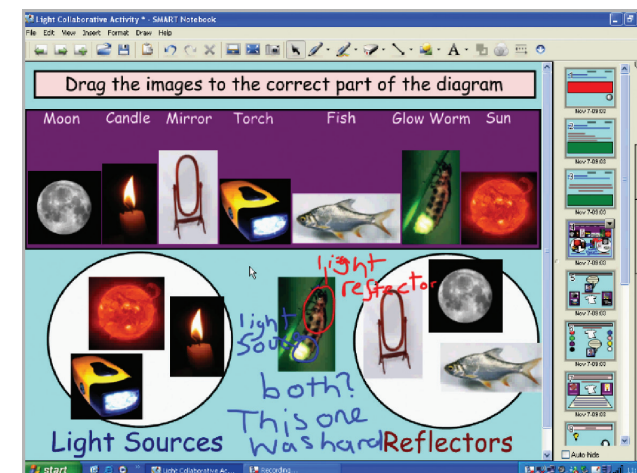
- Data collection over one school year
- 6 primary schools, 12 teachers (2 in each school)
- UK Year 4/5 – ages 8-10
- 3 science lessons (2 consecutive) – total of 36 lessons
- Observational data - video (lessons); audio recordings (interviews); teachers' reflective assignments and notes

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



Interactive Whiteboards and Collaborative Pupil Learning in Primary Science



Project contacts

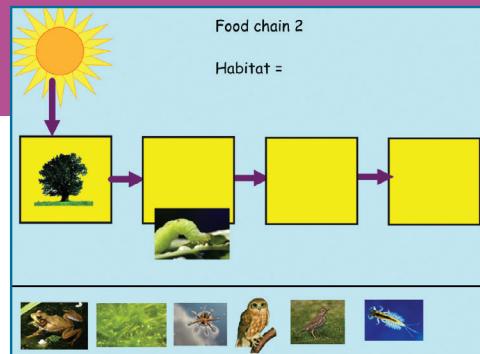
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A 'possibility is that the ground rules of exploratory talk ... serve to open and maintain a dialogic 'space of reflection' which facilitates the emergence of creative solutions to problems.'

Wegerif, R. (2008) Dialogic or dialectic? The significance of ontological assumptions in research on educational dialogue. *British Educational Research Journal*, 34 (3), 347-361



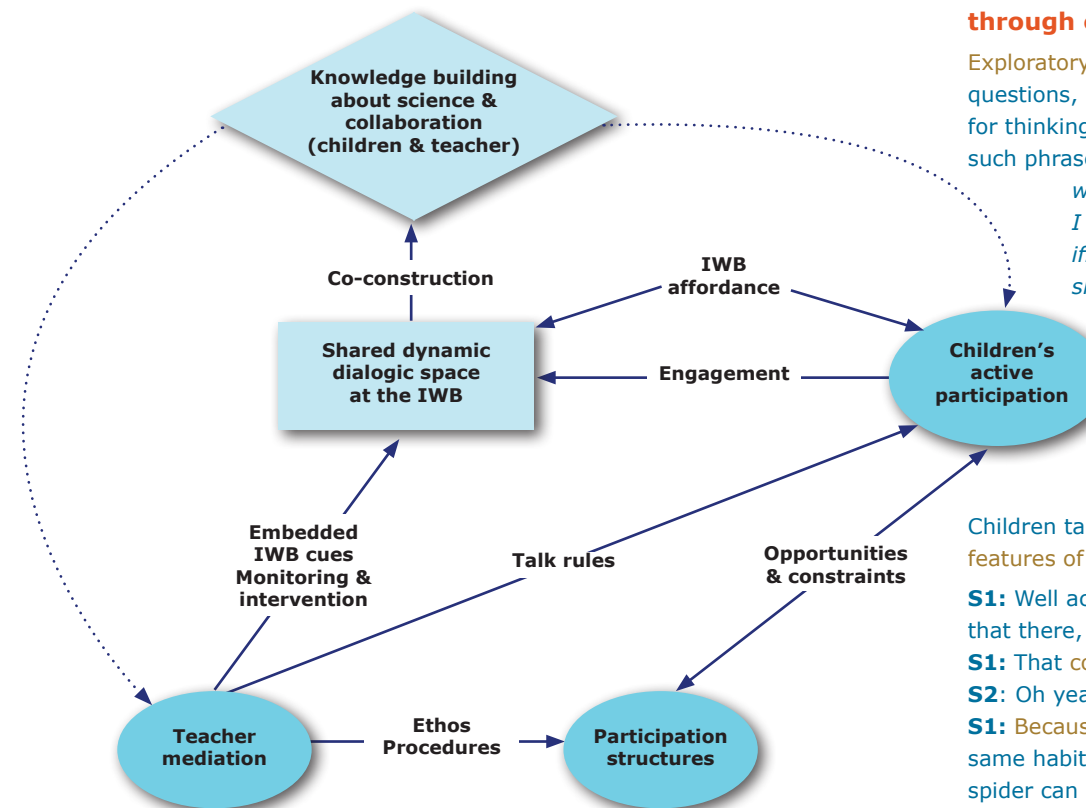
IWB – distinctive features and affordances for dialogue and group learning include:

- Multimodal representation
- Object manipulation
- Assistive memory
- Provisionality, stability and permanence
- External representation of thinking
- Editing – copy & paste, infinite cloning, drag and drop
- Pacing and sequencing of activity
- Large screen and physical working space

Teacher mediation

Teacher mediation is both direct and indirect. Indirectly, the vicarious presence of the teacher is apparent in two specific and interlinked ways: through enabling pupils' appropriation of introduced rules and procedures – in this case in relation to group talk; and by structuring IWB tasks so that interactivity between IWB pages is effected, enabling the pupils to connect with and interpret the teacher intentions for the task.

Modelling Collaborative Learning in Science at the IWB



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: So do you all agree with that?
S3: Do you agree with that yeah?
S2: Yeah.

Participation structures

Classroom participation structures comprise the established ethos, procedures and working relationships within the classroom workspace. They provide opportunities and constraints for developing children's agency and ownership of the activity at the IWB. They are in turn influenced by children's and teachers' responses to the use of the IWB for collaborative learning.

See also

<http://thinkingtogether.educ.cam.ac.uk>