

Interactive whiteboards and classroom interactions

Neil Mercer shares his research on the use of interactive whiteboards in primary schools

WITH COLLEAGUES FROM THE UNIVERSITY of Cambridge, the Open University, and Lancaster and Exeter Universities* I have been involved in three research projects exploring the use of interactive whiteboards (IWBs) in primary schools. This research was partly motivated by a concern that IWBs were being introduced into British primary classrooms and promoted as a tool which would (and should) “transform teaching” without a proper understanding of how their use might relate to teachers’ established, effective practice. We therefore investigated how IWBs are used in everyday classroom settings by teachers who are adept users of the technology. More specifically, we asked:

- Does the IWB function in distinctive ways in teacher–pupil interactions?
- Are normal patterns of classroom interaction altered by the use of the IWB?
- Does the use of the IWB affect the active participation of children in classroom activities?
- Does the IWB help in building shared frames of reference between teacher and children, and so enhance the coherence and continuity of children’s learning?
- Are the communicative functions of the IWB well exploited by teachers?
- Are IWBs a useful resource for supporting children’s collaborative work in the classroom?

An additional aim was to relate the use of IWBs to an appropriate educational theory. Sociocultural theory, built from the original work of the Russian psychologist Vygotsky, very appropriately recognises the importance of tools for building knowledge and understanding. This perspective allowed us to examine the IWB as a tool which might assist, enhance, disrupt, or transform teachers’ established practices. Video-recorded lessons in the classrooms of teachers in primary schools in south-east England provided our data, with sequences of lessons being recorded in each classroom.

*Karen Littleton, Paul Warwick, Alison Twiner, Julia Gillen, Judith Kleine Staarman, Ruth Kershner, and Sara Hennessy.

Teachers were actively involved in the research throughout, and interviewed afterwards for their views.

Results

Our analyses showed that the IWB enables a smoother and better paced presentation of curriculum content by a teacher than previously would have been possible. For instance, a teacher might previously have first shown a video, then written comments on a blackboard, next asked children to come to the front of the class and respond to pictures or text, and finally summed up on the board. With the IWB, all these actions can now be seamlessly integrated.

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We have seen teachers use the IWB to strongly engage children’s interest and guide their developing understanding by providing information in a range of different formats. While some of these activities could arguably have been carried out without the IWB, the flexibility and pace of the IWB presentation is unrivalled by other technologies. This assists planning.

In response to the question “are normal patterns of classroom interaction altered at all by the use of the IWB?”, our general answer is “no”. While the fixed position of the board at the front of the class tends to reinforce a traditional style of teaching, whereby the teacher is the central focus for whole-class question-and-answer exchanges, effective teaching stems in part from a willingness to alternate this with other styles and, of course, activities.

The IWB offers some good opportunities for the active participation of pupils, often one at a time but also to stimulate group activities. It is very useful for gathering ideas from individual and collective activity. For example, teachers or pupils can visually record contributions to a class discussion. IWBs can provide a good facility

for organising children’s group activity, for example by allowing a teacher to set up an interesting, well-structured series of multimedia resources with which children can interact and annotate as they work together. Children who used the IWB for their group work maintained a high level of involvement throughout. However, their effective use of the IWB was dependent on their teachers preparing them well for working together in groups, for example by agreeing with them on “ground rules” for how to talk and work together (see www.thinking-together.org.uk). Without this, as is often the case, group work is likely to be as unproductive as it would be without IWB support. The size and positioning of the IWB high on the classroom wall also sometimes created difficulties for children’s use of this technology.

Particularly noteworthy is the flexible capacity that IWBs offer teachers to combine careful lesson planning with spontaneous responses to events as they unfold, for example, to explore pupils’ misunderstandings. Teachers can easily move back and forth through resources at different points in time, so that information and ideas can be revised and developed through dialogue and discussion, with recourse to shared visual records, collectively generated material and other aids to understanding. Teachers can also “scaffold” children’s activities vicariously through the ways they set up resources and activities on the IWB. In this way effective teachers can use the technology to help provide coherence and continuity for children’s learning. For more information, see <http://iwbcollaboration.educ.cam.ac.uk/>

Conclusions

IWBs can be used to provide a clearly structured, well-resourced lesson, while their flexibility also allows teachers to respond spontaneously to what happens as a lesson proceeds. Our findings are that



technologically-adept teachers do exploit the IWB's facilities, and in imaginative ways. Previously time-consuming processes of preparing and presenting lessons can be made quicker for teachers – and skilled, imaginative teachers use them to create some particularly engaging resources and activities. This new tool does not replace the need for professional expertise, subject knowledge and pedagogic skills. Creative use of IWBs can promote new opportunities for pupils' active involvement, potentially making lessons more engaging and interesting for them. The facilities that IWBs offer for moving easily back and forth through visually striking material and for adapting such presentations as new understandings develop are of considerable pedagogic significance. This is the key aspect in which they are effective in the hands of skilled practitioners.

At the same time, our results also support the view that introducing new technology does not radically change teaching styles. Teachers we observed used the IWB effectively – but they used it to support their established style of teaching. We saw no evidence that the use of the IWB “transforms” teaching methods as has been claimed by governmental and other advocates of this technology. However, we would argue that effective teachers should not be expected to have their practice transformed just because some

What we know

- The introduction of IWBs has had positive outcomes for effective teachers.
- The use of IWBs does not automatically transform teaching methods.
- The potential of IWBs will only be realised if it is linked to the development of teachers' professional practice.

new technology has come along: it is more appropriate that technology is judged in terms of how well it helps professionals do their job. Judged in these terms, the introduction of IWBs in English schools has positive outcomes in the hands of effective teachers. This process will be assisted if examples of good practice, like those we have observed, are shared amongst teachers, and if all teachers train to become adept users of the technology. But the potential of IWB technology for supporting more innovative types of interaction in the classroom will only be realised if their use is related to the development of teachers' effective use of dialogue and pupil involvement in the classroom. It will be interesting to see if lessons from the British experience influence the use of this technology elsewhere in the world, where its take up is only just beginning on any large scale.

About the author

Neil Mercer is Professor of Education at the University of Cambridge. He is a psychologist with a special interest in classroom dialogue and the development of children's thinking, who has also led several projects on science and maths education and the use of ICT in schools. His most recent books are *Words and Minds: How We Use Language to Think Together*, *Dialogue and the Development of Children's Thinking* (with Karen Littleton) and *Exploring Talk in School* (with Steve Hodgkinson).

Further reading

Gillen J, Kleine Staarman J, Littleton K, Mercer N, & Twiner A (2007), A 'Learning Revolution'? Investigating Pedagogic Practice Around Interactive Whiteboards in British Primary Schools. *Learning, Media and Technology*, 32(3), 243–256.

Mercer N, Hennessey S, & Warwick P (2010), Using Interactive Whiteboards to Orchestrate Classroom Dialogue, *Technology, Pedagogy and Education*, 19(2), 195–209.

Warwick P, Mercer N, Kershner R, & Kleine Staarman J (2010), In the Mind and in the Technology: The Vicarious Presence of the Teacher in Pupils' Learning of Science in Collaborative Group Activity at the Interactive Whiteboard. *Computers & Education*, 55(2), 350–362.