

IT'S A VISION THING ...

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Abstract

During the past two years Interactive Whiteboards have been installed in an increasing number of classrooms in the United Kingdom. Most teachers have embraced the technology: they see it as something that supports and extends their teaching capability (Smith, 1999; Levy, 2002). The affordances of interactive whiteboard technology, however, do more than reinforce traditional classroom praxis: they provide ways to make learning an interactive process; they create possibilities for teachers to transform their role (Glover & Miller, 2001). As yet, however, research evidence on the impact of IWBs on pedagogy is limited.

Changes that have taken place in teaching and learning have previously been assessed (Cuthell, 2002). This paper describes seven action research projects across England, sponsored by MirandaNet and Promethean, that assessed the effect of Promethean ACTIVboards on student learning, the impact on pedagogical skills, and relates the evidence to a year-long national survey of school implementation of IWB technology and teacher attitudes.

Data was collected during 2003 from teacher surveys, case studies and observation of classroom practice.

UK Background

During the past two years there has been increasing use of interactive whiteboards in schools in the United Kingdom. The Department for Education and Skills has made £50 million of funding available from 2003 – 2005 for the purchase and installation of interactive whiteboards in classrooms (Clarke, 2004).

Despite this official support there has been considerable debate in the educational community over the extent to which interactive whiteboards can transform teaching and learning. One view maintains that it is the digital projector, rather than the interactive board itself, that has the greatest effect. Another view is that, whilst teaching had become more interactive, and the teaching process itself transformed, the same transformation in interactive learning has yet to be proved.

The technology has the potential to make student learning a faster and more effective process, and to restore to teachers a sense of creative autonomy. This has implications for school-based in-service education, as well as for teacher educators (Cogill, 2003; Cuthell, 2002).

The case studies that form the basis of this paper cover Early Years education through to post-16 students (K-12), and curriculum areas from teaching reading through Phonics, Mathematics, ICT and Music, and indicate the effects of the technology on classroom practice. Cross-curricular aspects such as visualisation, the impact on disaffected students, underachieving boys and the transformation of departmental and institutional practice are also covered.

The evidence from these studies demonstrates that the impact ACTIVboards and ACTIVstudio have on teaching and learning is far greater than could be achieved by the use of a data projector alone. In all of the studies it can be demonstrated that the role of the learner has changed: learning has become participatory and interactive. An affective and cognitive shift has taken place in the ways in which young people perceive their role as learners.

Teacher surveys

During 2003 teachers from schools, colleges and universities responded to an online questionnaire and posted information about their uses of interactive whiteboards, and the effects that they had experienced in their teaching and their students' learning (Cuthell, 2004).

There was a wide variation in the number of IWBs installed in classrooms. Some schools had equipped all classrooms; others were in the process of doing so. There was a trend in secondary schools to install a

board in each department. Other schools had installed boards in dedicated rooms that were available for booking. Others were in ICT suites.

Teachers were most enthusiastic about use of the boards when they had one in their own classroom. This was particularly true in Primary schools, where teachers felt that they had been empowered by the technology. Teachers whose only use of the board was in an ICT suite, or on an occasional basis, experienced little change in their teaching style or the ways in which their students learned. All teachers who used the boards commented on the positive impact on their lesson preparation, range of resources used, delivery and the effects on student learning. These effects had continued and become more marked even after students had become used to them – the Hawthorne Effect (Franke & Kaul, 1978) did not necessarily apply in this context.

Teachers were able to support a range of learning styles and intelligences with the use of IWBs.

Most teachers felt that the learning in the classroom had become more interactive and students more engaged with the learning process, and all teachers said that Interactive Whiteboards use is most effective when it is available for the whole of the teaching day.

The most widely-installed IWBs cited in responses were Promethean ACTIVboards, and use of the ACTIVstudio software was seen as critical to transforming both teaching and learning.

Teacher Case Studies

Visualisation and Learning: Journey into Visual Teaching and Learning

(Thomas, 2004)

THEN

My first exposure to interactive white boards (IWB) was at the British Training and Technology show (BETT). I witnessed a demonstration of diagrams and clipart being used as part of a lesson and my jaw dropped. I felt like I immediately needed one but I could not persuade my department to fund the extremely expensive equipment.

Seeing the board in use set my imagination racing. How could this be used to enhance the teaching and learning in my classroom? Could the computer eventually be used in every classroom as a flexible tool? It was the heady late 90's and technology, as ever, seemed to be developing at a rate of change that was hard to keep abreast of.

NOW

I walk in to my classroom and turn on my laptop. I connect the IWB and turn on the video projector. I log in to the network by radio connection and call up my prepared lesson on 'ICT in Society'.

Short video clips and report writing tasks engage the students. It looks like the days of wishing I had an IWB are over. Now I can start my journey.

Inter-ACTIVboards for Interactive Maths

(Wood, 2004)

Jonathan Wood's classes have used 25 portable networked laptops with the ACTIVboard to save student work into flipcharts. The students use these flipcharts to develop their memory and revision skills. They recap the work at the start of the lesson or in the plenary. This is easily achieved with the ACTIVboard by loading saved flipcharts. The technique is particularly effective when the students themselves have produced the work they are recalling. Memory needs to be jogged frequently before a topic embeds itself, and Jonathan feels that the interactive whiteboard is the perfect tool for this. Topics that go on for 2 or more lessons are greatly enhanced by reviewing the previous lessons' ideas. Coursework in particular may take up to 8 lessons. Students can miss lessons, or they may simply need clarification of a point made several days previously. The ease with which these notes can be brought back is superb. Notes can be printed direct from the board or e-mailed home to the whole class. Another application of technology is having the ability for the children to produce documents on their computers and e-mail the work to the computer connected to the IWB. It adds importance to their work and even allows them to annotate their documents while explaining their findings.

Switching On Switched Off Children

(Graham, 2004)

Have you ever looked around your classroom and wondered how many of your students are really engaged with the lesson, or are in a world of their own?

Karen Graham, of St. Giles C. E. Primary School, decided to investigate this, and to see whether the ACTIVboard that was being installed in her classroom would change things. More important, she felt, was whether the change would be a permanent one.

Karen had been following a programme of active lesson participation for more than a term before she began this research. Structured observation was conducted to assess the involvement of all students in the lesson: their active participation was recorded, as well as the types of behaviour when students were off-task.

There was a significant increase in the number of positive indicators, matched by a significant decrease in the number of negative indicators, after the ACTIVboard was installed in the classroom. Student response rates improved; there was far higher attention to the task in hand and far greater eagerness to answer questions. The pace of work increased, as did motivation.

The positive effects of the ACTIVboard were maintained throughout the study: there was no point at which the students became habituated to the new learning environment and failed to 'switch on'. To quote her students,

"All classes should have an interactive white board because it's fun education and it makes you want to learn!" "It has made the class work more. The class loves doing work and it has improved the speed of work. Our behaviour is always better and every morning I really want to come to school and do some work!"

The impact of Promethean ACTIVboards on underachieving boys and their learning

(Lowe, 2004)

Kirsten Lowe, at Castle View School, Sunderland, has been concerned with issues of underachievement, particularly that of boys. Her research looked at the ways in which ACTIVboards, ACTIVote and ACTIVstudio could be used to increase attainment, and change the attitudes of boys towards learning and work in Geography lessons. 50% of the group had been on report for poor behaviour and associated attendance problems. All had negative attitudes towards learning. Kirsten analysed students' subject preferences and built a programme of work that utilised the tools that came with the whiteboard.

ACTIVstudio software was used to create flipcharts, and a number of tools, such as the spot light, reveal, the countdown clock, the eraser to reveal text and pictures, tickertapes and hyperlinks to photos and text and images from the image library. The boys were encouraged to work in groups, as well as individually, show their work and responses on the board and learn how to use the board tools themselves. As far as the students were concerned, these were truly interactive lessons.

ACTIVote was also used. At the start of a lesson, the boys would be given a small 'test' using ACTIVote. They would then complete the same test at the end of the lesson, which gave them instant feedback as to how well they had understood the content and their progression during the lesson. It also introduced the competitive element which motivated the pupils. A number of pupils were disappointed if they *didn't* have a test during the lesson! Videoed readings and debates were projected onto the ACTIVboard for student assessment.

The impact of using the Promethean ACTIVboard interactive whiteboard to teach literacy skills at Key Stage 1

(Scott-Baker, 2004)

Marion Scott-Baker's research has investigated the factors that delay the development of reading skills in Year 1 and which, if not remediated, lead to learning difficulties of dyslexia. She decided to use the Activboard to restore some self-esteem and also address some of the children's visual memory difficulties in a new and lively way. One of the key skills is to be able to remember match a sound to a symbol (grapheme/phoneme correspondence) and being able to remember a series of symbols in the correct order. The ACTIVboard lends itself to teaching these skills.

As well as working on visual memory and visual sequential memory the grapheme/ phoneme correspondence was reinforced. They were taught to match single letters and digraphs to their sounds and then to respond automatically to a variety of different letters such as *ai, ay and a-e* which all make the same sound 'ay'. This was a skill that they had been unsuccessful in acquiring in the Foundation Stage. The final factor that led to the improvement was that the board keeps young children with short concentration spans more involved and makes the objectives of the lesson clear to children who are relatively new to language and to the skills required for formal learning.

Hit the Road, Jack: Music Teaching and ACTIVboards

(McNally, 2004)

Tony McNally is Head of Music at Castle View School, Sunderland. He has an ACTIVboard installed in his department, but he was keen to evaluate the specific effects of the board on teaching and learning. He uses an ACTIVboard connected to his music technology and other resources. With the ACTIVBoard classes can view two separate pupil performances on video file, then analyse differences in performances.

There is now a greater creative use of input and resources, along with more 'quality' Teaching and Learning time with the ACTIVBoard. Tony can: toggle between subject specific software and the ACTIV flipchart, give group or whole class examples via video clips, help to keep the students on task or raise self-esteem and pupil confidence. At one point he was able to quickly throw in an interactive activity "Music Blockbusters" for motivation.

The immediacy and interactivity of the ACTIVboard, and the integration of other resources with the flipchart, makes a significant difference in the pace and outcomes of the lessons. Levels of motivation and involvement for all classes have improved. In terms of the impact of departmental practice, Tony comments: "I was the first teacher in school to have the ACTIVBoard installed in my classroom a little over a year ago and it may not merely be coincidence that my department's GCSE A* - C results improved from 52% to 80% this year: the first time we have achieved better than the national average in my subject. And this was with 32 music students!"

Some teacher reflections

"My teaching is now much more visual, which helps to support all children in my class, particularly those with hearing, visual or speech and language difficulties. I use it for whole class, group, independent and individual work.

"I would find it difficult to go to a school without one now ..."

"I can't begin to imagine teaching without my IWB, particularly for literacy and numeracy. The use of digital cameras around school has meant that lessons such as "how we change as we grow up" in science can be covered using images of people familiar to the children which makes the whole lesson far more relevant to them."

"I have taught for 10 years now and interactive boards have radically changed the way I teach. Teaching is in fact now more relaxed and less stressful."

Summary

The case studies and teacher comments indicate the degree to which interactive whiteboards have changed teacher praxis: the affordances offered by the technology have stimulated teacher creativity and collaboration with colleagues. Teaching has been transformed and become interactive: teachers are much more aware of the ways in which they can support visual, aural and kinaesthetic learning styles to enhance student learning.

The case studies indicate ways in which the learning process has become transformed and made more interactive for students. Despite this, there is still a feeling on the part of some commentators that students remain the recipients of what the teachers deliver. In part this derives from the fact that movement and physical involvement on the part of pupils and the class is relatively easy to quantify, whereas the learning process itself, whether internalised, collaborative or existential, is more difficult for an observer to monitor. What is significant is that the majority of students who participated in the case studies have stated that, for them, learning has changed: it has become more effective, easier and – most interestingly – more fun. Observations of classes using IWBs reveal students focused on the lesson, directly involved and keen to demonstrate their learning. The detailed [case studies](#) available online illustrate the degree of student involvement and active learning.

Some observations and reflections from students

ACTIVboards and Mathematics – student feedback

(Franklin, 2004)

What's the immediate change when interactive whiteboards are installed? 80% of students enjoy Maths! Ben Franklin, at Sir Charles Lucas Arts College, in Colchester, assessed the impact of ACTIVboards after they had been installed in the Mathematics Department for a term. He surveyed a sample of students from years seven to ten. These initial reactions from students identify the immediate differences they have noticed.

Students said:

Their teachers used the boards all, or most, or the time – 95%.

Use of the board has improved the teaching of Maths – 89%.

The teacher uses pre-prepared information most, or all, of the time – 87%

Use of the board has improved their enjoyment of Maths – 80%

Use of the board has improved their learning of Maths – 78%

Visual learning is improved – 70%

Lessons are more interactive – 63%

Understanding has improved – 46%

Primary School Student reflections
(Graham, 2004)

*The children work faster and behave better and listen more.
I wish our school had more interactive whiteboards for next year!
I think that it has changed our personality completely
It makes the children excited and gives them something to look forward to when they
finish a lesson or arrive in school.
It makes me feel as though we are moving to a new world ...
All classes should have an interactive white board because it's fun education and it
makes you want to learn!
The children learn more because it looks more interesting!
My wish is that the rest of the classes in the school have a board so that all the children
have the privilege to use this brilliant whiteboard.
More children want to take part in lessons and so they learn more at once.
It has made the class work more. The class loves doing work and it has improved the
speed of work. Our behaviour is always better and every morning I really want to come
to school and do some work!
It makes lessons fun and easier!*

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- Detailed case studies are available to download from [Virtual Learning](#). Interactive presentations can be found on the [Promethean](#) site.
- MirandaNet www.mirandanet.ac.uk
- MirandaNorth www.mirandanorth.org.uk
- Promethean, Ltd. www.promethean.co.uk
- Virtual Learning www.virtuallearning.org.uk

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