The Use of Interactive Whiteboards in Schools

Summary: The following pages are not a theoretical treatise on pedagogy but rather practical suggestions for making the Interactive Whiteboard earn its keep – and benefit staff and students alike.

Introduction:

Perhaps the IWB is the most misunderstood and abused resource since the OHP - particularly when used as no more than a 'Data Projector'. Don't we all remember the grotty photocopied typewritten black-and-white presentations where the presenter had to re-focus the machine, sometimes got the flimsy slides upside down or back to front and finally insulted the audience by reading exactly what was displayed on the screen? And what about the plenary session where someone in the audience wanted to go back to a previous 'slide' which the presenter had lost under a pile of scripts and statistics? [1]

Well, all that has changed with the introduction of the IWB – or has it? I still see far too many presentations which start by the presenter or his/her technician having to find the hard-drive folder containing the appropriate presentation. The game is then given away as the audience are all shown the whole content of the file before finally getting to see the first page in 'Show' format. [2]

And then comes the really boring bit, in standard MS template style, whereby the presenter proudly (yes, you've guessed it) reads what is on the screen and sends the audience to sleep. The underlying principle of the Visual Aid as being just a support to the teacher's performance seems to have been forgotten. And, more to the point of this paper, the IWB is still often controlled by the teacher – often from the teacher's desk and thus negating all the benefits of physical interactivity by which a real classroom performance can be enhanced.

There are few very good exponents of the group-dynamic that can be generated with the IWB and unfortunately the mathematicians, scientists and technologists in schools are not generally the best performers of this craft. In too many secondary schools the emphasis is still very much on technologists hiding behind their equipment and lecturing their students. As I suggest below, we should take note of good Primary Schools' practice. As with much of classroom practice good exponents of the IWB craft are too busy in the isolation of their own classrooms to realise what is NOT happening in other subject areas. Furthermore, good 'communicators' in subjects like English, Drama, Music and P.E. tend not to be in the forefront of technological competence and often (in my experience) do not realise what they are missing.

My stint of six years in Advisory work as a Peripatetic teacher of I(C)T (some 20 years ago!) convinced me that unless advisors have the vision to bring members of both ends of the ICT capability spectrum together and share best practice we will never move forwards. As I have repeatedly said elsewhere, 'how-to-do-it' manuals (or even the best of websites) are no substitute for real observation of good practice – You cannot hold the butterfly (of excellent performance) inside a text-book – it is transient or ephemeral – it needs to be seen to be believed. If in doubt, go and find good practice and compare it to the levels of Interactivity I list in Part – 3.

The following pages, therefore, attempt to flesh-out the writer's perceptions of good IWB practice.

Part 1 - The Technical 'Bits'

A note on Health & Safety:

The BECTA website makes some very clear warnings about the placement of projectors – and rightly so. However, such instructions as "*do not stand facing the projector*" don't match with my idea of class teaching or student-lead group activities although children new to the medium must be made aware of the dangers! Yes, the projector must be appropriately placed and, particularly if using a portable setup, strict note must be taken about not looking at the light source.

Which Projector?

Be aware, there are many different projectors and screens – they all have their own idiosyncrasies as I hope to identify![3] Projectors have improved a great deal in the last few years and IWB users can become a bit blasé about their use. The popularity of 'home' projectors has reduced the 'bottom-end' price - don't be fooled into buying a unit that is not designed for long daily use! Is the alignment correct – if not why has it changed – and has the calibration/registration been re-checked? Some projectors are so powerful these days that they can be used on 'economy' mode without any noticeable loss of brightness but add significantly to the life of the lamp.

Do you know your way around the menu for the particular projector? Are you familiar with the 'Mute' or 'freeze-screen' facility? (Both are very effective classroom tools.) If the projector is portable, do you use the 'Keystone' facility? Do you use the 'source selection' to switch between computers and say, a DVD or Video player?

The Lamps (or bulbs) cost between £300 and £500 each and must therefore be treated with respect.   The lamp must be allowed to cool down after use – at least ½ an hour I would suggest. Use the 'Mute' button if you just want it off for a few minutes. But at the end of the day, at weekends or holidays, what then? - Remember to switch the main power supply off as well (but as above – only when the projector has cooled down!) Also, you must remember to clean out the dust filter every half term otherwise the lamp can overheat.

The Screen:

Get familiar with the particular screen – can you write on it with a board-pen? What happens if the proprietary 'pen' is lost or the battery is flat - does it work using your finger? If you work in several rooms are all the boards by the same manufacturer? Some manufacturers definitely warn against using pens on their boards, others recognise that on some occasions it might not be appropriate or possible to switch on the projector. - What does the teacher do then? If you have the luxury of alternative (ordinary) whiteboards – the problem can be worked around for 'plan-B', but too often classrooms cannot afford the luxury of having both types of board and enough room to display children's work. If this is the case, one would hope that you have boards which you can write on with normal board-markers. In one school where I installed a number of IWBs, for the just-in-case scenario, I fitted small upright whiteboards by the side of the IWBs for the occasional 'scribble' notice or reminder.

Remote Operation:

Still far too many teachers rely on their keyboard and mouse for the operation of the display. Generally my observation is that Primary School teachers are more willing to allow their students to interact directly with the board than happens in most Secondary Schools. (There are probably issues of class-control and 'showmanship' with older students.) However, I strongly suggest that

all teachers should equip themselves with a good quality USB 'clicker', capable of controlling the screen from the back of the classroom, thus enabling the teacher to walk around the classroom whilst being in control of the screen.

Sound Systems:

Do not forget to install additional speakers by the sides of your board. Some projectors have built-in speakers but they are generally too feeble for large groups and, anyway, the sound comes from the wrong direction! Adding good quality speakers (usually with a built in amplifier) adds real 'theatre' to video/audio-clips and thus enhances the professionalism of your presentations.

Part 2 - Software:

It is important to recognise that there is often confusion concerning the five distinct types of software which can be used on IWBs:

1. 'IWB operating software':

ie the particular software tools and additions provided by the IWB manufacturer.[4] One of the first things I always do is to set my range of pen sizes and colours. Next is the facility to 'screen-capture' pages of work – and here the menu options can be different and not always obvious – certainly the network manager needs to ensure that we can save screen files to teachers' own user areas. The next facility I delight in is handwriting recognition – this facility needs no 'training', unlike voice-recognition software, and is real magic with students.

2. The Support Tools:

Most IWB manufacturers supply useful libraries of software tools, backgrounds, clip-art, graphical data-display or mind-mapping tools etc. Much of what I have seen to date tends to be somewhat childish, 'glitzy' or 'Simpsonesque' and not quite representing the subtle qualities of precision and orderliness that most disciplined subjects like Science, Business Studies or Technology might prefer. Quite fun in the Primary School but not quite GCSE, A-level or Adult Education format!

3. The Generic Tools:

eg MS Office can all be used to good effect and, as a starting point, particularly where there are a variety of different boards in an establishment. In fact I often encourage new users to stick to applications like MS PowerPoint because of its sheer portability between different board types. Certainly, in one establishment, I could be using any one of 5 different types of board. Preparing work at home would be a nightmare if I had to ensure five different brands of IWB software were installed on my home computer!

However, there is a danger that we assume that IWBs are still just a presentation tool rather than an interactive medium. How we add 'hot-spots' or hyperlinks is a mark of our understanding of the questions or problems students may face. At the very simplest level the presentation must allow for jumping back to a 'home' menu or 'contents' and hyperlinking to an appropriately linked page. – for more on interactivity please see the separate section.

4. Interactive Programs:

There are an increasing number of purpose-designed programs and educational 'games' which build upon the interactivity of individuals or groups. When the program matches the purpose as identified in the lesson plan, when a group-dynamic suddenly emerges and transforms your

lesson, then great! Otherwise re-write your lesson plan or think through the functionality of the software as to how you can best exploit its interactivity.

5. Remote Access:

Interactivity does not depend just upon what has been prepared beforehand or what the teacher (or student) wants to demonstrate at the board. There are several applications developed in order to display students' work on either the IWB or on selected workstation screens. Often thought of as little more than 'Spy-ware', using applications such as 'NetOp', students can display on the large screen their own work and, perhaps more importantly, use the student to show how they 'did it' at their own workstation and then get others to modify ideas on the IWB. Demonstrations, pride of ownership, discussion of different approaches can be controlled by the teacher so as to focus a class's attention on an otherwise silent member of the group. The quiet sense of achievement given to a hard-working student whose work is displayed before the whole group, in full wide-screen display, with appropriate praise is a very powerful feature not to be ignored.

Part 3 - Five Levels of Interactivity?

Some years ago I read a document on Software Interactivity and the general principle is worth repeating and applying to the modern classroom situation with IWBs:

Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
No control, View only	Very basic, Forward, Back, Esc.	Full navigation, hyperlinks	External sources, videos etc	Record activity, answers etc	Return scores, diagnostics

Honestly, how interactive are we, really?

Using the above table as a reflection upon our teaching styles may prove most salutary. How 'interactive' is our use of the IWB in terms of the above? Do we regularly consider how far we want our students to go? Dewey wrote many years ago about surrounding the child with appropriate experiences and resources. Too often we allow the resources we surround our students with to act as a ring-fence rather than a springboard. However, on the other hand, well prepared resources can act as a boundary marker to the student who can easily wander off-track: eg "Check out theses links" rather than wasting time so-called 'investigating', browsing like sheep and going up blind alleys!

It is far too easy (or lazy?) to rely on the IWB as just a presentation tool rather than an interactive medium. We often talk about the 'kinaesthetic experience' - but do we believe it or understand it? The magic of making drop-down menus work in front of the whole class for a child should not be dismissed. When a Science simulation is about to go wrong on the screen and teams of students are calling out the correct actions to take, salutary note should be taken of the learning experience.

The ubiquitous PC, networked or otherwise has a special function as a personal and private 'confessional' - and this can be a valuable aid to learning. Students can work at their own speed, review, edit and revise their work, even re-visiting several times. However, the public declaration

of opinion, the demonstration of skills and knowledge without necessarily having to 'speak up' brings many more students into the group dynamic. The IWB is an exceptional cross-cultural device giving dignity to many otherwise under-achievers! On this argument alone I would suggest that the IWB should be made compulsory in every classroom without exception.

A final point on interactivity – or lack of it. - I call it Belshazzar's finger (from Daniel Ch.5). At Belshazzar's Feast a mysterious finger wrote on the plastered wall and everyone got very confused and frightened wondering what it all meant. In the same way teachers can often mouse-around at their PC and in confusion (if not actual fear) children look at the screen wondering what is happening. However, if the same processes are physically performed, by the teacher's finger or pen on the IWB, children are more able to see what is actually happening. Please note that this is not just a trivial exercise for KS1/2 children. I have found great benefit in teaching from the board using my finger when teaching GCSE electronics and CAD/CAM.

Part 4 - Twelve Teaching Techniques?

In one school, some six years ago now, I worked on a whole-school project developing the use of IWBs in all subject areas. In working alongside teachers I soon realised that colleagues quite naturally applied the IWB technology to their existing teaching styles – and enhanced them. My vision was to share these individual (and somewhat insular) practices with other departments, thus widening and enriching the learning and teaching experiences of all subject areas. With further developmental work I soon realised that I needed to try and classify these different styles and/or techniques and why it was that the IWB was such an effective medium:

1. List Sorting

Using the handwriting recognition software it is so natural to scribble students' answers on the board, or let students (possibly using one or two 'scribes' only) write up the answers themselves. The software quickly translates and with any necessary spelling corrections we then have a list that can be quickly moved around the board and sorted in any sequence or grouping we want. Captured, saved or printed for further use.

2. Developing Tray

A variety of techniques to reveal, part-reveal or slide words or phrases from a given list are all useful tricks. The most obvious aspect is that the teacher has had to think out the examples beforehand but, of more value – especially if your handwriting is as bad as mine – no need to turn your back on the class writing up lists during the lesson.

3. Handwriting

Long gone are the days of beautifully crafted 'copperplate' handwriting or the time to sit and stare whilst the teacher got out his board-ruler to draw parallel lines on the blackboard before even beginning to write. Neatly laid out pages, precisely written and always correctly spelt are perhaps the strongest motivations for using any form of presentation software. The ability to scribble on the board and almost magically convert that into presentable text is, for me, an overwhelming excuse for having an IWB.

4. Brain Storms

The term 'Brain Storm' has been described as not PC. However, we should also be aware that the term has been hi-jacked by one software company, as also 'Mind Mapping'. So if I refer to 'bubble diagrams' you know what I mean! Quite simply the use of bubble diagrams or spider diagrams is a powerful feature of some software tools whereby text blocks can be drawn, moved,

added to or recombined at will. Much like Venn-diagrams, a class can discuss and relocate items into groups with great flexibility. Certainly the 'brainstorm' concept of just shout out the ideas, let them flow, and then identify groupings or connectivity afterwards suddenly becomes a bit laborious when it means hand-drawing on paper, repeatedly, until we get it right. The IWB group dynamic suddenly makes real sense, ideas can flow without the usual limitations of neatness or correct spelling, and ideas can then be re-arranged, added to or deleted and formatted appropriately.

5. Lesson Outlines
This is one of my favourite uses of the IWB. Initially not necessarily very interactive: a nice screen presentation of the initial 'Bell-Work', Objectives, Lesson Outline etc are all very impressive. Stages of illustration, explanation or just a reminder of step-by-step instructions are all immediately to hand throughout the lesson. But… then comes the Plenary. - Well, then. Just click on the various hyperlinks you have anticipated to discuss as the class leads – a whole new dynamic rarely seen with the OHP!

6. 'Boundaries'
Particularly in ICT it is so easy for student to wander off into 'By-pass meadow'. Other students in the same group might have serious difficulty even typing in the first URL (and some URLs can bore down a very long way!) By placing a set of prepared links on screen and demonstrating with students, if appropriate, we are setting the limitations to suggested exploration of ideas and this has been 'publicly' declared to the class. I usually have these prepared pages (even my whole lesson plan) available for students to access themselves – particularly useful for absentees, slow learners, use by LSAs etc.

7. Multiple pages
Long gone are the days when after school I used to laboriously prepare neat drawings of engineering sections or woodwork joints, using coloured chalks, on the blackboard, only to discover next morning that the 'Night School' class had rubbed them all off! Or, more often than not, another teacher wanted to use my board and couldn't because I'd written very clearly, 'Please DO NOT erase!' Now all my special drawings, pictures or spreadsheet calculations are instantly available using the IWB multiple pages or even the generic applications!

8. Prepared links
We are now well used to HTML hyperlinks from underscored words – but why so uninspiring? I very often use the actual website logos or other cartoon figures on a page as 'hot-spots' helping children to identify with topics or even just recognise colours or shapes instead of plain textual links. Similarly, specific locations on a world map or different items of scientific apparatus can be linked to further pages of illustrations or JavaScript pop-ups of small paragraphs of explanatory text. 'Visuacy' is a topic close to my heart – do teachers really understand the benefits of visual memory, comprehension or association etc?

9. Simulations
Yes, it is often possible for students to watch a simulation on their own PC. However, there is something exciting and capable of generating a real group-dynamic when a simulation is displayed on a large screen. The "What happens next?" scenario makes lessons come alive and meaningful. For several years, now, I have used the impressive scientific simulations provided by Learn Premium[5] to good effect. Teachers should, however, be aware that any web-based media is liable to discontinuation or re-location. Where appropriate and permissible, useful simulations should be downloaded to the school's local server.

10. Video Shorts

There was a time when teachers would disrupt the flow of a lesson in order to show a video, finding the right place, stopping when the class wanted to see more etc. In Business Studies, for instance, digitally edited small 'clips' of film, played over the IWB seamlessly at the appropriate moment, with the discipline of 'that's all folks' controls what the teacher deems appropriate for that lesson works very effectively.

11. Maths & Science Symbols

From my observations, writing neatly and quickly on a board is not one of the most obvious skills of many Maths and Science teachers. (Try constructing a complex long-chain polymer with an ordinary board marker!) How then can we place before our students definitive typography when complex mathematical symbols, diacritics or Greek iconography is essential. I have observed excellent practice across all ability ranges (right up to A-level) whereby prepared libraries of relevant symbols are kept readily available and dragged to the main text area of the board as required.

12. Concept Maps

I find Concept Maps[6] help my own lesson preparation and as such provide powerful visual illustrations of, for instance, a body of knowledge or experience to be considered. As with any software, the ability to edit or re-arrange items is very powerful in and of itself. However, when combining prepared Concept Maps with the interactivity of the IWB lessons become so much more fast-moving AND comprehensible.

Endnotes

[1]   If your slides contain a lot of detail or points to be discussed later, it is a good idea to number the slides so that you can jump back to a particular slide during a plenary session. Otherwise, use hyperlinks or navigation buttons to move to anticipated pages.

[2]   When you are satisfied that your presentation is complete, why not save as a 'SHOW' and then place a shortcut on your desktop? This will give a much more organised feel to your presentation!

[3]   See the Becta website for more help/info' at: http://whiteboards.becta.org.uk/

[4]   I must confess that after eight years of using and installing IWBs I much prefer the SmartBoard format. Yes it needs installing correctly and some of the software that comes with it can look somewhat 'Primary-ish'. However the SmartBoard meets all my criteria for interactivity – I love the handwriting recognition and screen capture etc and, of course, you can write on the board with an ordinary boardmarker.

[5]   Learnpremium is a website that schools pay to access. It covers reception through to AS level and is presented in the national curriculum's key stages. A yearly subscription allows unlimited access by all teachers and pupils to all areas of the site. Plus, Learnpremium can be paid for with e-learning credits.   (see http://www.learnpremium.co.uk/)

[6]   There is a wide range of 'mind-mapping' software available – most of it expensive or far too 'glitzy' for my somewhat conservative taste. I use CMAP which is a free utility which nicely exports as graphic files for my IWB or printed reports. (see http://cmap.ihmc.us/)