SMARTBOARDS: INTERACTIVE WHITEBOARDS IN CLASSROOMS

Peter Kent

Embedding Learning Technologies
Module 13
Peter Kent

Peter Kent is the Deputy Principal of Richardson Primary School and has taught Mathematics and Science in secondary schools. Peter has overseen the integration of interactive whiteboards at Richardson Primary School. Peter has written several articles relating to the use of Interactive Whiteboards within teaching and learning programs, and has presented a paper on this topic at the 15th International Conference of the Society of Information Technology and Teacher Education, Atlanta USA, 2004.
Module 13. SMARTboards: Interactive Whiteboards in Classrooms

Contents

Introduction 4
Getting Started: The Easy Way or the Hard Way 4
What is an Interactive Whiteboard? 7
e-teaching rather than e-learning 7
Digital Convergence / Multi-Modal Teaching / Interactivity 10
In Teachers We Trust 13
e-teaching examples to generate ideas 14
Evolution to e-teaching 20
Further Reading 21
SMART Guide for teachers 22
13. SMARTboards: Interactive Whiteboards In Classrooms

Introduction/ Rationale
This course is designed for teachers and school executive who are:

- teaching within settings equipped with interactive whiteboards
- anticipating the arrival of an interactive whiteboard within their teaching setting
- investigating the option of obtaining interactive whiteboards within their school.

The course will focus the participants’ thoughts on issues that will help them to ensure that interactive whiteboards maybe used effectively within an educational context. Some technical instruction on ‘how to operate a SMARTBoard’ is included, yet this comprises only a small section of this course. As such this course is highly relevant to all teachers, despite the type of interactive whiteboard they may be using.

Getting Started: The Easy Way or the Hard Way
The catch phrase ‘it is not the technology, it is the teacher’ has never been so true as it is with interactive whiteboards. An even truer phrase however would be ‘it is not just the teacher, it is the school’. The school environment needs to possess certain traits to ensure that interactive whiteboards can enhance teaching and learning within the school. Research is showing that in those schools where these traits do not exist the embedding of interactive whiteboards is problematic and often ineffectual.
Before interactive whiteboards are introduced into a school the following should be in place:

- **Commitment from school leadership:** The introduction of interactive whiteboards into a school’s teaching practice is significant. Teaching practice will have to change for the technology to be successful. Without the commitment of the school leadership, success will not be easy. Just as introducing a new student welfare system into a school would not be successful without the commitment of the school leadership, the introduction of interactive whiteboards should be thought of in the same context.

- **Multiple Boards or Users:** Schools should plan to initially purchase more than one board, or allow access for more than one teacher to the board. Three or four boards acquired over a short period of time should be considered a minimum. Sharing ideas and reflecting on experiences is a critical factor in gaining early skills and momentum. A group of sufficient size needs to be created to allow this to occur. Potentially isolated teachers need to be proactive in establishing a network with other teachers from other schools using the technology.
• **Permanently Fixed Interactive Whiteboard:** Mobile interactive whiteboards have rarely been successful within school settings. This is due to the time and technical skill required to set up all the components of the technology. Where possible teachers should have access to interactive whiteboards for the vast majority of their teaching time. Teachers with limited access often lack the potential to spontaneously experiment with an idea. The ability to spontaneously experiment, try something new and unplanned is essential to developing new teaching strategies incorporating the interactive whiteboard.

• **Time:** Sharing and reflecting amongst a team takes time. Unless that time is planned for, and placed within a regular timetable it is unlikely to occur. “Without words there can be no ideas, without time there can be no words”.

• **Digital Input:** Even with outstanding teaching skills, and a well-resourced learning community to develop and discuss lessons, the full educational potential of interactive whiteboards will not be realized without access to digital information from a variety of sources. A scanner is essential, which when combined with a digital camera can provide a digital context capturing the local environment. Access to the Internet and the wide variety of digital resources contained within is also considered essential.
What is an Interactive Whiteboard?

An interactive whiteboard set up involves the image generated by a computer being projected onto a touch sensitive screen the size of a conventional whiteboard, where a touch is the equivalent to a mouse click. It is simply a touch screen computer with a very large screen. However the sum is greater than its parts: it is more that a computer, projector and screen. Lee & Boyle state, “After noting how the technology is now being employed … the generic term ‘interactive whiteboard’ fails to communicate the immense education capacity of the tool. In reality … the technology is a large-scale, digital convergence tool.”

e-teaching rather than e-learning

“After 20 years, despite a vast investment by government and parents the desktop driven strategy has only had a narrow and limited impact on teaching
and learning. Use of that strategy alone needs to be questioned.” (Lee and Boyle) How many school administrators have been frustrated by the fact that the ever-growth ICT budget has made only a limited, sporadic impact on classroom practice? Why might this be the case? The good-hearted Albany in Shakespeare’s King Lear probably sums it up best, “striving to better oft we mar what’s well”. In Education’s headlong pursuit to take advantage of the enormous potential of computers we seemed to forget what fundamentally underpins successful schools, that is, quality teaching by professional teachers.

Personal computers have tended to undermine ‘teaching’ because ‘teaching’ with a computer is an extraordinarily difficult task for a variety of reasons. Trying to teach a class a new concept using computers where there are only a small number within the classroom is practically impossible. To begin with you cannot present a concept where all the class cannot see the computer screen. Computer Labs are the other main way schools set up ICT resources, yet those teachers with experience teaching in a computer lab will know just how difficult it is to ‘teach’ in these settings. Gaining and maintaining student attention is a tricky task when students are sitting in front of a computer. The scope of a teacher or student to take an investigation into a particular concept in an unexpected direction is limited by the flexibility of the particular software being used. If it is possible to adapt the software, or perhaps open another program, the process of gaining the class’ attention, directing the class in a particular direction, seeking their opinions on the implications of this direction and making this new piece of information fit
in with their existing knowledge is again practically impossible. This is why terms like ‘self directing’ and ‘self administering’ are often associated with good educational software. Personal computers are able in certain circumstances to assist students to learn; this is known as ‘e-learning’, they do not assist teachers to enhance their teaching skills. This maybe why we have never heard of the term ‘e-teaching’, until now.

**Interactive Whiteboards and e-Teaching**

Interactive whiteboards have allowed teachers to make significant changes to their classroom teaching practices. Interactive whiteboards have allowed our teachers to ‘e-teach’. Succinctly, ‘e-teaching’ involves the use of ICTs to enhance the art of teaching. Harnessing the potential of digital technology in presenting a concept, exploring the implications, placing the concept in various contexts, creating links with existing knowledge, and leading discussions that probe student understanding and allow students to take their learning in personally relevant directions. e-teaching is a group activity and so sits in contrast with the conventional approach of incorporating ICTs into teaching programs, where normally the activities are aimed at the individual or couples. The group can range up to the size of a normal class group. e-teaching is less didactic creating a truly interactive teaching and learning environment. Students can also interact with the content and context of the lessons by digitally capturing and manipulating their work and local environment, incorporating it within the lesson and sharing it with the group. E-teaching in the Richardson context involves teachers managing
this convergence of digital information from a wide range of sources and devices when presenting, discussing and reflecting upon a concept with a class group. In an ‘e-teaching’ context, a multi-literacy teaching and learning environment is standard. Interactive whiteboards allow teachers to teach multi-sensory, multi-faceted style of lessons, seamlessly jumping from one type of digital media to another. Teachers can easily introduce text, sound, video, graphics and interactivity based on the tactile nature of the board. These combined with the teacher’s oral skills provides a teaching and learning environment where providing for different learning styles, and teaching a variety of literacies is standard. The students’ experience with their computer games and TV enables them to easily engage with this style of teaching.

**Digital Convergence / Multi-Modal Teaching / Interactivity**

An interactive whiteboard is a necessary component for an e-teaching approach to classroom practice. The size of the board facilitates group activities, the group being a central focus of daily classroom teaching. The interactivity, the tactile nature of students’ interactions with the board promotes an elevated level of engagement with the lesson. These factors alone will however not make a significant difference to the quality of the teaching and learning process over the longer term.

It is the teacher’s ability to manage classroom activities where students can interact with the concepts, content and context of the lesson that makes e-teaching as a pedagogical approach effective in the long term.

Lee and Boyle describe interactive whiteboards as a ‘digital convergence tool’. Digital convergence in a classroom context is the ability to capture and present information in a usable form from a variety of ICT devices and digital information sources. To incorporate digital convergence effectively
into teaching the convergence must be manageable in real time, and be flexible enough to facilitate spontaneous and radical changes in the direction of the lesson. One of the key elements of traditional teaching practices is the ability to manage a dynamic group discussion, allowing it to flow in interesting yet unplanned directions, responding to questions, issues raised and reflections of the class. In an e-teaching context a teacher can manage the digital convergence facilitated by an interactive whiteboard to provide digital content to support this style of classroom teaching. Teachers can digitally capture the local context, and content relevant to the students, for their lessons, rather than having to rely on the predetermined context and content found within the normal range of off the shelf teaching resources. In addition the digital convergence offered by an interactive whiteboard provides the spontaneous flexibility that is one of the defining skills of quality teaching.

Within an e-teaching framework, it is normal for the digital information used within a lesson to come from a variety of different types of media. Digital cameras can provide still images and video that are set in the context of the children; microphones can acquire voice and the sounds of the local environment. With CD and DVD drives being standard, a wide range of music and video can be incorporated into lessons. Scanners digitally convert the written work and art of students’ into a digital form. They can also digitise books and other paper based resources relevant to the class. The Internet can provide text, sound, graphics and video, as well as interactive software sometimes referred to as learning objects or meta-data. Encyclopaedic CD ROMs and interactive educational software are also a great source of digital content to enrich a lesson. With this wide array of digital sources to call upon an e-teaching context is one where the teaching and learning naturally transpires in a multi-media, multi-literacy environment.
The multi-tasking capacity of computer, that is the ability to have a number of different files and programs open simultaneously, allows the seamless and instantaneous move from one source of digital information to another, from one type of media to another.

In summary, the digital convergence and multi-tasking facilitated by a normal PC, combined with the size and interactivity of interactive whiteboards, allows teachers to use ICTs to enhance their existing professional skills. The technology promotes a media rich, multi-literacy teaching environment where the tradition classroom dynamic of a teacher teaching a class is retained. This is the essence of e-teaching.
In Teachers We Trust

Interactive whiteboards, and e-teaching, are still relatively new. There is no lock step guide informing us how to ‘e-teach’. Teachers know how to teach. They know how to present concepts and information, guiding students through enquiry. This in essence is one of the major differences between a teacher and a generally educated person off the street. Within an e-teaching framework, these fundamental qualities and skills of teachers do not change; they are enhanced through the use of interactive whiteboards.

The key to the success of the interactive whiteboards and the development of ‘e-teaching’ was the professionalism of the teaching staff at Richardson. Teachers and their skill to teach is fundamentally the greatest asset that a school can have. Teachers were motivated to base their use of the boards in the existing context of their professional skills as teachers and encouraged to discover ways that the technology could enhance these professional skills. Through group sharing, discussion and celebration of their experiences a rich set of teaching strategies was developed that took advantage of the interactivity and digital convergence the interactive whiteboards provided. Teachers were allowed to follow directions that were personally relevant to themselves and their teaching context. This provided a great diversity of skills that could be shared across the teaching staff, ensuring that all were leaders and learners during the professional support sessions. No expectation was placed on teachers other than they would ply their skills to the best of their ability. The results exceeded all expectations. Two years ago the majority of the teaching staff had only rudimentary ICT skills. In the
past two years the group has markedly enhanced those skills and now wants the higher order skills to progress the program even further. Lee and Boyle found in their review that “collectively the Richardson staff has developed an expertise in the educational use of the interactive whiteboard technology that is probably unparalleled in Australia.”

**e-teaching examples to generate ideas**

The following are short examples of ‘e-teaching’ lessons. It is intended that they be read to generate ideas as to how interactive whiteboards and digital convergence can be used to advantage within the readers particular context.

**A kindergarten class was exploring the concept of symmetry.**

Rather than completing symmetry tasks for pictures from a book, students identified symmetrical objects in the room and a digital photo was taken of the object. The photo was displayed on the SMART Board and a white square was placed over half of the object, along the line of symmetry, covering half the image. The students estimated and drew the outline of the covered half of the object, drawing on top of the white square. The white square was moved away and the students were able to assess the accuracy of their estimation of symmetry. The most engaging symmetrical object was students’ faces.

**Scanning of written work to facilitate group drafting / correction**

After the completion of a writing activity a student is chosen to have their work scanned and displayed on the SMART Board. The class then discusses the work, using the pens to annotate changes that they might make and correcting mistakes. All students are motivated to complete high quality work so that the number of mistakes that may be found are minimised. The proof reading skills of the entire class have increased as all students are motivated
to find a mistake in the work of others, or suggest acceptable improvements in expression or style.

**Cloze using class books**

Instead of using a cloze exercise from a pre-prepared set of exercises, a page from a current book that the class is reading is scanned and displayed on the SMART Board. By using a thick pen width and changing the pen colour to white the teacher can draw over selected words, hiding them. The result is an instant cloze exercise, set in the context of the student’s learning. Upon correcting the exercise all that is required is to move the ‘white pen’ away from the covered word. This could be done one letter at a time if hints are needed.

**Cloze using daily newspapers**

Students who do not normally engage in books could be motivated to read and complete a cloze exercise by creating a cloze exercise using short newspaper articles downloaded from the Internet. For teenage boys, articles from the sport pages can often engage their attention.

**CMI2**

Count Me In 2 games are often time consuming and expensive to make. Demonstrating them to a class can also be problematic depending on the size of the class and the space available. A number of games have been created using SMART Notebook. The games can be demonstrated and played with the class or small groups with the students interacting with the boards, moving objects around. There are also a variety of CD ROM and Internet maths games that are very engaging and beneficial when teaching numeracy concepts. An example of CMI2 games on the Internet can be found at: [www.abc.net.au/countusin/default.htm](http://www.abc.net.au/countusin/default.htm)
Concrete materials in the digital age
Within the senior primary school years the students often reject using basic concrete materials in helping them to solve maths problems. Using tokens and counters is often considered as babyish. However many students are not ready to transfer their learning to the abstract solely, in many respects this is a major reason for student difficulty in picking up the concepts relating to fractions. Virtual ‘concrete materials’ can be created within SMART Notebook which students can manipulate and visualise processes in order to increase their understanding of more complex and abstract concepts.

Brainstorming / Mind mapping software
Brainstorming and Mind Mapping software such as SMART Ideas or Inspiration are very effective in facilitating and recording group discussions relating to complex themes and topics. These types of software packages often allow lines to be draw between issues or facts displaying connections in a visual manner. Most programs of this type allow this visual mind map to be converted into a series of grouped dot points that could be used by a class as an outline of an essay plan.

Weather
During a lesson on interpreting weather maps the teacher simultaneously access a number of real time satellite and radar images from the Australian Bureau of meteorology web site (www.bom.gov.au). Using the interactive whiteboard they could discuss and annotate the images (Fig 1). Based on their learning of weather formations the class would make predictions as to the current weather conditions at various major cities around Australia. The class then checked their prediction by accessing real-time images from those cities via web cams from each city.
The Internet for comparisons of two sides of an issue

When a class discusses a controversial issue the Internet can be used to source information and arguments relating to both sides of the issue. The class could then compare and contrast the points of view put forward by both sides, perhaps summarising the arguments in using mind mapping software as outlined in the example above. Environmental issues lend themselves well to this type of activity.

Feelings

This lesson involved discussing with the Kindergarten students the concept of feelings and teaching them ways to respond appropriately to however they were feeling at any given time. The class brainstormed on the interactive whiteboard different feelings that they might have at school. Each student was asked to act out one type of feeling. A digital camera was used to capture an image of each child while acting a feeling. These were then pasted onto a feelings page on the SMART Board, which was saved and retrieved when the need arose (Fig 2).

Figure 1

Figure 2
**Class role**
Digital photos are taken of all students and then placed into a PowerPoint slideshow that becomes the class role. Students are welcomed into the class in a way where they see the photo displayed and as such feel a sense of immediate engagement with the lesson. It is often a good idea to have a ‘student of the day’ interact with the board, in effect calling the role.

**Modelling appropriate behaviour**
Within junior classes it is common for teachers to take digital photos of the class or individual when they are modelling appropriate behaviour. These photos are then displayed on the interactive whiteboard when that behaviour is desired, eg silent reading time, structured play, general working time. Senior classes often use a scrolling text screen saver to display a theme or attitude that the class is focusing on.

**Teaching handwriting**
SMART Boards have a record function that allows a short period of interaction with the board to be recorded and replayed. This featured is often used when teaching handwriting. The teacher will write the letter or letters being learnt onto the board and record this process. The recording can be replayed on a continuous loop, allowing students working at their desk to view constant reinforcement of the correct process. This process also has potential for teaching Asian scripts.

**Editing poor reading**
Using the software program Audacity, students with poor reading skills make recordings of themselves reading extracts from a story. This software allows the students to edit out any stutters, silent pauses or errors. The edited sound
file can be combined with either scanner pictures from the book, or student drawn illustrations to create a digital talking storybook, which can be presented to the class via the interactive whiteboard.

Virtual tours
Many tourist attractions, especially educational tourist attractions, often have created virtual tour of the attraction placed on the Internet. These tours can be used to orientate and focus the class prior to an excursion to the site. Equally it is often not possible to visit the physical location or attraction, a virtual tour is a good substitute. Example of a virtual tour: http://virtual.questacon.edu.au/

Communicating daily routines
Teachers are able to outline the structure and sequence of the day on a Notebook page. The software allows the easy incorporation of text and graphic. The ability to quickly move between pages within notebook allows the teacher to easily refer back to the daily structure when needed.

Sentence structure
A seemingly random set of words and grammatical notations is placed on a notebook page. Students are asked to create statements by dragging the words into a correct order. Students would then be asked to slightly rearrange the statement, changing it into a question.

Sentence structure
Retrieving saved work and old lessons allow teachers to point out links between different areas of the curriculum. Students often enjoy discussing previous pieces of work that they have completed, especially in the light of new learning that has taken place.
Evolution to e-teaching

Starting to ‘teach’ in a computer lab often feels like learning the trapeze without a net. Malfunctions, even small ones, with the software or hardware can often be fatal, ensuring both a wasted lesson, and often second thoughts about trying to teach in these settings again. Interactive whiteboards have built in their own safety net. If there is a problem with the anticipated lesson, or a piece of software, an interactive whiteboard at the end of the day can be used as a conventional whiteboard.

Teaching with an interactive whiteboard is an evolutionary process. Teachers will probably begin by reproducing what they were doing on a conventional whiteboard. As they explore various features of the technology and gain in confidence the extent to which they use the interactive whiteboard, tapping its potential will increase. The rate in which teachers are able to change their pedagogy, to tap the potential of the interactive whiteboard will vary between individuals. The concepts outline by e-teaching provide a good framework within which teachers can reflect so as to increase the rate up take of teaching strategies taking advantage of the technology.

The guide included at the end of this course is designed to give teachers help with some of the basic features of a SMART Board and Version 8 of the operating software in order to get started.
Further Reading


This guide is intended as a brief introduction only, covering only the basic features. If you have used this guide some feedback, either positive or negative, would be greatly appreciated. To give feedback please Email Peter Kent on peter.kent@richardsonps.act.edu.au

The teachers of Richardson Primary School have produced this guide. Richardson Primary School retains the copyright ownership of this guide. Permission is given for the guide to be freely copied for the use of employees of the ACT Department of Education and Training. January 2004
# Contents

## Getting Started
- To Orient the Board 24
- To open the Floating Tools 24
- To open the Control Panels 24
- To use the Keyboard and Writer 25
- To use the Recorder 26

## Changing Common Settings
- To Adjust Pen and Eraser settings 27
- To change the precision of the Orientation 28
- To set up your Floating Tools 29

## SMART Notebook Features
- Notebook Page Functions 30
- Notebook Basic Functions 31
- Notebook Screen Capture 32
- Notebook Grouping Objects 33
- Notebook Backgrounds 34
To Orient the Board

To Open the Floating Tools

To Open Control Panels
To Use the Keyboard and Writer

Press the Keyboard Button on the Pen tray to launch the Keyboard, or select through the SMART tools.

Functions like a normal Keyboard

Click here to open writer.

Hand writing will be converted to typed text.

Press here to insert text into document.
To Use the Recorder

SMART Tools

Press here to start recorder

For SMART Recorder

Press here to end and save recording
To adjust Pen and Eraser settings

SMART Tools

For Control Panel

To change pen/eraser width
To change pen colour
To make pen a highlighter
To change the precision of the SMART Board's Orientation

SMART Tools

For Control Panel

To pick orientation precision

Choose Board Settings

Then choose required precision.
To set up your floating tools

For Control Panel

To set floating tools.

drag to add.
Notebook - Page Functions

To add blank page

To select and add a template

Standard templates

To delete current page

Press on side bar to access different pages
Most of the basic functions of Notebook are found on the tool bar.

The Notebook tool bar is very similar to most Microsoft toolbars and as such most of the icon perform the same function that they would in programs such as word.
Screen capture allows you to copy the whole or any part of what is displayed on the SMART board. The result of this capture is pasted into a Notebook file.
It is sometimes desirable to group together a number of objects to form one single object.

**To group objects**

1. Select object to be grouped
2. Draw → Group

Objects may be ungrouped by selecting the grouped object then: Draw → Ungroup
A background is part of Notebook page that cannot be selected. It is often desirable to make objects backgrounds eg. lines, grids graphs, etc.

This makes a selected object part of the background. That is it cannot be selected.

Backgrounds can be retrieved with Retrieve Background.