

Interactive Whiteboards



The Biology class is studying the functions of the heart with a graphical and text-based presentation projected onto the whiteboard. All queries are clarified by drawing on the large, touch-sensitive screen. As well as allowing a number of pupils to click on an organ and visually explore its relationship with the heart, the teacher draws arrows to indicate the direction of blood flow and later initiates a discussion to test their understanding of the topic. The teacher has also linked parts of the diagram to other web-based and computer-based multi-media resources. The students use the board's authoring software and make presentations to their classmates.

What is an Interactive Whiteboard?

An interactive whiteboard is a large, touch-sensitive panel that connects to a digital projector and a computer, displaying the information on the computer screen. It resembles a traditional whiteboard and is used similarly. The computer connected to the interactive whiteboard can be controlled by touching the board directly or by using a special pen. Such actions (inputs) are transmitted to the computer instead of using a mouse or keyboard.

Possible Educational Uses

Interactive whiteboards present educational resources in a highly interactive way and are suitable for whole class and small group settings. They allow pupils to engage and interact with the technology to become active participants in learning. Pupils with special needs can particularly benefit from the presentation of multimedia content on a large screen as it can aid in both information processing and retention. Optimal use of an interactive whiteboard involves both the teacher and students using it in a classroom situation. It can, for example, be used to:

- Allows presentation of student work in a more interactive and collaborative model
- Show video clips that explain difficult concepts (in any curricular area)
- Demonstrate how an educational software program works, e.g., an art program with students using their fingers and hands to draw rather than working with a mouse
- Cater more effectively for visually impaired students and other students with special needs
- Display Internet resources in a teacher-directed manner
- Create handwritten drawings, notes and concept maps during class time, all of which can be saved for future reference

Technical Considerations

To get an interactive whiteboard up and running, five separate components are involved:

- Touch-sensitive whiteboard
- Digital projector
- Computer
- Software
- Connectivity (wired or wireless) between the computer, whiteboard and the projector

The computer and the associated whiteboard software are fundamental to the process. The digital projector (see Advice Sheet 15) allows everything that is happening on the computer screen to be projected on to the whiteboard where everyone can see it. The touch-sensitive whiteboard allows users, either the teacher or students, to interact with the information being displayed, i.e., to interact with the computer. Generally speaking, marker pens (electronic or ordinary) are used as input devices, but some whiteboards allows users to use their fingers, as the pointing device, directly on the board.

Types of Boards:

The surface of an interactive whiteboard is critical to its functionality and is a distinguishing factor between the different technologies used in the boards themselves. The interactive whiteboard captures the pen or user's finger inputs and detects where the user is touching the board, this information is then used as input to the interactive whiteboard software.

There are 3 different technologies used for this purpose

Resistive Membrane

The board surface incorporates a soft flexible vinyl or polyester-based plastic front surface and a rigid back board. Two layers of resistive material with a small gap between them create a touch-sensitive membrane, which is used to detect where a student or teacher touches the board. Applying pressure to the front surface (by using a pen or a finger) registers a contact point that is used as input to the interactive whiteboard software. The advantage of whiteboards based on resistive technology is that one does not require special pens to write on the board, a finger can be used just as well. One possible disadvantage is that as the surface of the board is soft it can be damaged by the use of ordinary markers, so the school needs to make users aware of this.

Electro-Magnetic pick-up

These whiteboards are similar to traditional whiteboards in that they are rigid to the touch. The pens used with them emit a small magnetic field, which the board detects on pen impact or movement, and this information is then used as input to the interactive whiteboard software.

Infra-Red scanning

By attaching infra-red scanning devices to an existing whiteboard or flat surface it is possible to transform an ordinary whiteboard or surface to act as an interactive whiteboard. These scanning devices are light and portable and can be used with different types of standard whiteboards. Tracking of colour and patterns is based upon using special encoded pens, each of which has a uniquely encoded reflective collar that the board uses to identify its colour and position.

Purchasing Considerations

The cost of an interactive whiteboard varies considerably and generally depends on the type of technology chosen, and on the size of the board. Of the types discussed above, the infra-red attached whiteboard is the least expensive, as it works with standard whiteboards. Schools should note that

Software is almost always included in the purchase price of the whiteboard, but it is necessary to check if this software allows users to:

- Draw or write on the board using different coloured pens or even the students' fingers
- Print out or save the results to the computer
- Use "layering", "grouping" and other features which allow the user to create their own classroom resources, often with the help of an associated gallery.

Some suppliers supply specialised software packages to suit either Primary or for Post Primary schools.

Boards range in size from 35 inches (diagonal) to 78 inches (diagonal) and normally cost in the region of €1500 - €3000, including controlling software. Most boards can be fitted to a moveable stand, costing in the region of €300, enabling access in different locations, or can be wall-mounted. Generally the kit to do so is included in the price; however, installation and configuration of the board and projector could add another €500 to the overall price. If the school does not already have a digital projector, this can make the quite expensive as suitable projector prices begin at approx. €800, plus €320 for a replacement bulb. Some suppliers provide integrated, wall-mounted projectors, bringing the total guide price to €6,000 (including installation). Given the price variations it is essential to seek best value by obtaining

quotations from at least three providers. Note that these indicative prices do not include the price of the computer itself.

Infra-red Interactive whiteboards are the least expensive option. Such systems can be purchased for under €1000, with the school providing its own board and projector.

Other relevant questions:

- Is there local technical support in case there are hardware or software failures?
- What is the duration of the suppliers warranty?
- Is there a charge to receive future software upgrades, or will these be free of charge?

Additional Considerations

The following relevant points should be noted when considering introducing interactive whiteboards to a school.

- Before purchasing an interactive whiteboard the school should ensure that it will be used appropriately to engage with pupils. Will the whiteboard re-enforce the 'sage on the stage' role of the teacher-directed classroom, or will it facilitate the 'guide on the side' teach role and student-centred learning?
- Interactive whiteboard should be located in classrooms, not in computer rooms.
- Which teacher(s) will use the board? Given the expense of the board, there may be some degree of local negotiation needed to decide priority access.
- Will the board simply be an expensive projection screen?
- Will the board work with the particular computer platform(s) in the school and with platforms about to be used in the school?
- Will the whiteboard need to be freestanding or fixed to a wall?
- The size of the board should be sufficient to enable all pupils to clearly see the contents of the board.
- To enable all students and teachers to reach all parts of the board, a height adjustable type is preferred.
- Is the software supplied with the whiteboard appropriate for the needs of the school?
- Consider if the digital projector should be ceiling mounted or portable?
- How and where will teachers prepare lessons using the interactive whiteboard?
- How and when will staff receive training on using the interactive whiteboard?
- What is the situation regarding licensing of the software that comes with the board?

Interactive whiteboards create a range of learning opportunities for both students and teachers. Studies have found them to be highly motivating and learner-centred when integrated innovatively.

Relevant Web Sites:

Becta Research

www.becta.org.uk/page_documents/research/wtrs_whiteboards.pdf

This document summarises Becta research on Interactive whiteboards

Drumcondra Education Centre's Interactive Whiteboard project

www.cbiproject.net

This is a portal site for Drumcondra Education Centre's whiteboard project, containing links to classroom resources, to suppliers, and pedagogical advice.

IWB link on Wikipedia

http://en.wikipedia.org/wiki/Interactive_whiteboard

This is an information page on the Wikipedia website

Note: While the advice sheets aim to act as a guide, the inclusion of any products and company names does not imply approval by the NCTE, nor does the exclusion imply the reverse. The NCTE does not accept responsibility for any opinions, advice or recommendations on external web sites linked to the NCTE site.

This Advice Sheet and other relevant information are available at:

www.ncte.ie/ICTAdviceSupport/AdviceSheets/