



## 3D Teaching at The Abbey School

# Two UK schools are using Texas Instruments DLP® 3D-ready technology to bring science lessons to life

**The result has been an improvement in the pupils' understanding of difficult topics**



## User:

The Abbey School, an independent girls' day school of over 1,000 pupils - and The Emmbrook School, a mixed comprehensive school of 1,200 pupils.

## Challenge:

Install a vivid and engaging 3D projection system in both schools, providing teachers with an easy to use teaching aid and help pupils understand difficult topics.

## Solution:

Cost-effective DLP® projectors from a variety of manufacturers installed in classrooms of both schools, linked to a specialised laptop running 3D content.

## Result:

"Children taught with traditional 2D methods created flat, two-dimensional models, but pupils taught using 3D DLP instinctively built three-dimensional models." Kathryn Macaulay, Deputy Headmistress at The Abbey School.

## Let's start with a test

If you were to draw a diagram of a plant cell, what would it look like? For decades, teachers have taught children the structure of a plant cell using a two-dimensional illustration, a plan view of the cell cut in half. The Abbey School in Reading, UK, along with other schools around the world, is leading the way in helping children better understand complex subjects through the application of 3D projectors using DLP technology. DLP helps turn two-dimensional topics into an engaging 3D learning experience.

## Planting powerful ideas

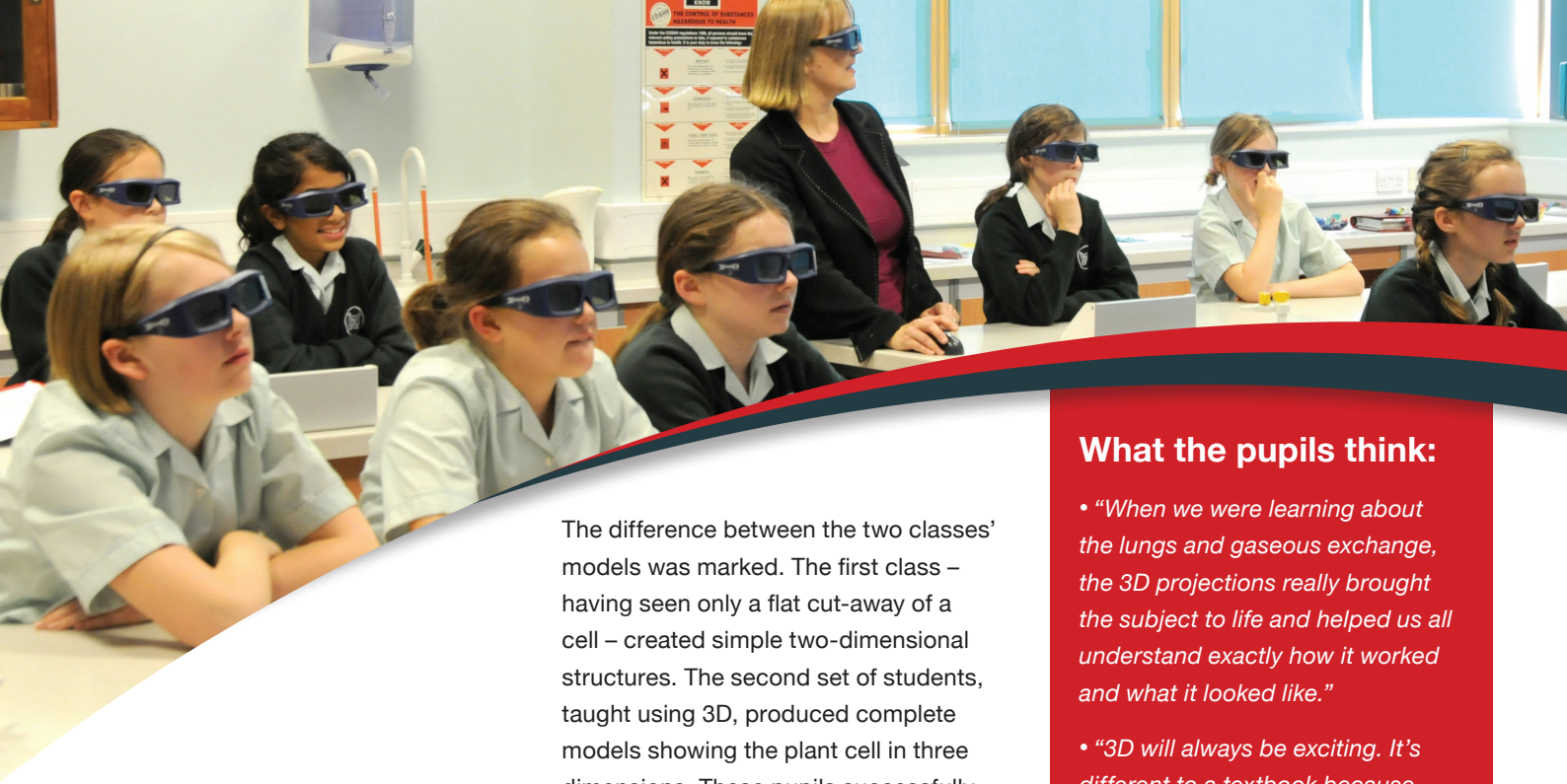
The Abbey School is an independent day school for girls aged 3 to 18. The school's pupils are high achievers and many go on to study at the very best universities after achieving excellent grades at A level (in 2010 70% were A\*/A) or the IB Diploma. The school recognises that all of its pupils are 'digital natives' – those that have been using computers from a very young age. As such, The Abbey School strives to provide its pupils with the best ICT equipment and integrate the latest technologies into the classroom teaching experience.

DLP was developed by Texas Instruments in the late 1980s, and is one of the world's most prevalent imaging technologies for digital front projectors. DLP's high refresh rate allows projectors to handle a 3D image that can be viewed via active 3D glasses supplied by a specialist 3D manufacturer, such as XpanD.

Emmanuel Herbreteau, Marketing Manager at Texas Instruments: "The versatility of DLP-equipped projectors makes it compatible with 3D input sources, with forecasts suggesting that more than 1 million 3D-ready projectors have been shipped today."

## Why DLP 3D-ready projectors?

When it comes to projectors, The Abbey School considers DLP the technology of choice. Kathryn Macaulay, Deputy Headmistress at The Abbey School, said: "We use DLP projectors made by Optoma, the main criteria being that every projector we purchase uses DLP technology. DLP projectors offer great picture quality in both 2D and 3D, good value for money and are very reliable. The priority for us is that we can run 3D content to help our pupils learn using the best possible resources."



Macaulay, who also takes responsibility for the school's ICT policy, first introduced DLP projectors in April 2010 after seeing the potential advantages of using 3D projection. The Emmbrook School, a state comprehensive school in nearby Wokingham for 11 to 18 year-olds, has also been trialling a DLP digital 3D projector over the same period.

Claire Loveday, Curriculum Leader for Biology at the Emmbrook School said, "We've found that pupils respond well to being taught with the 3D projectors. The children are visibly more interested in what we are teaching. We use the projector primarily for Biology, but we expect our new software upgrades will widen this to Chemistry and Maths, as well as Key Stages 3, 4 and 5. The 3D projector is particularly effective for helping pupils follow difficult topics that are not easy to teach without a visual demonstration."

### **The results are in - students are fully engaged**

The plant cell project is The Abbey School's latest example of the power of 3D teaching. Two classes of the same age group and ability were asked to create a model of a plant cell; one class had been taught using the traditional 2D illustration and the other class had been taught using a DLP-equipped 3D projector.

The difference between the two classes' models was marked. The first class – having seen only a flat cut-away of a cell – created simple two-dimensional structures. The second set of students, taught using 3D, produced complete models showing the plant cell in three dimensions. These pupils successfully understood the structure of the cell and recreated a more accurate model.

Ros Johnson, Head of Science at The Abbey School: "Both groups of children were given identical briefings and access to the same modelling materials. The results revealed to us how little pupils understood using the traditional plant cell illustration." Kathryn Macaulay adds: "The Abbey School is a selective school, so as a result the range in ability – the difference between our best and worst pupils - is relatively small. It would be reasonable to think that any given project would produce a consistent result."

In a further test, four classes of year-eight pupils (age 12 to 13) were taught the structure and function of the human ear. In multiple-choice tests conducted the week following the lessons, the 3D-taught students produced significantly higher marks compared with the groups taught using traditional methods. The mean score in the 3D lessons was 8.33 out of a possible 10, while the traditionally taught children returned a mean score of 7.00.

### **Looking to the future**

The Abbey School will continue to purchase Optoma-made DLP 3D-ready projectors for its classrooms, as well as sourcing new 3D content (supplied by 3D software experts, Amazing Interactives) for core subjects.

## **What the pupils think:**

- "When we were learning about the lungs and gaseous exchange, the 3D projections really brought the subject to life and helped us all understand exactly how it worked and what it looked like."
- "3D will always be exciting. It's different to a textbook because it adds so many layers and brings so much depth to what we are learning."
- "I was taught the anatomy of the human eye and ear using the 3D projection models, and I feel I remember more now – 6 months later – than if I had been taught using a textbook."

## **"The children are visibly more interested"**

Kathryn Macaulay: "The way DLP 3D projectors help every child to engage in their subject is invaluable. It literally gets them off their seats and grabs their attention." The DLP 3D projectors complement traditional methods (textbooks, physical models) but allow every pupil – right to the back of the classroom – to enjoy and participate in an immersive learning experience.

"I really can't find a single disadvantage with the DLP 3D-ready projection system," continues Macaulay, "almost all IT implementations have some kind of caveat, but the DLP system can't be faulted. It's a win-win for staff, pupils and our school."



[www.emmbrook.wokingham.sch.uk](http://www.emmbrook.wokingham.sch.uk)



**The Abbey School**

[www.theabbey.co.uk](http://www.theabbey.co.uk)



XpanD supplied the active 3D glasses to The Abbey School and Emmbrook School. XpanD was created by industry veterans in theatrical exhibition, entertainment, film production and distribution, and specialty film and digital technologies. This broad range of professional entities is the driving force in creating the ultimate digital 3D experience.

[www.xpandcinema.com](http://www.xpandcinema.com)



Middlesborough-based Amazing Interactives supplied the 3D content for The Abbey School and Emmbrook School's 3D projectors. Amazing Interactives specialise in 3D software and hardware for consumer and commercial use, with a team of digital experts able to create bespoke solutions for any situation.

[www.amazing-int.com](http://www.amazing-int.com)



Optoma is a world-leading designer and manufacturer of award-winning projectors for business, education, professional audio/video and home entertainment. Optoma 3D-ready projectors have been installed in both The Abbey School and Emmbrook School.

[www.optoma.co.uk](http://www.optoma.co.uk)



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