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## **Does the Availability of Ceiling Mounted Digital Projectors** **Improve Teaching and Learning?**

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**Submission Date: 2<sup>nd</sup> December 2004**

**Geographical area where research was conducted:**

Hayesfield School Technology College, Bath

**Pupil age range: Secondary**

### **Background**

Hayesfield School is a Technology College on a split site. It is unlikely that the school will ever be on a single site. We have been moving towards putting our resources on-line using the school network and the internet, so that materials can be accessed from anywhere. All staff and students have Digitalbrain eportal accounts, which facilitate this process.

The school is keen to develop, and improve the richness of, the material that we have access to on-line. Students are ever more exposed to visually stimulating images at home via the internet and digital TV. We must respond to this in order to continue to capture students' attention.

We are planning to move to a structure where every classroom has a ceiling mounted digital projector, with access to the network, and the internet via broadband. Rather than have TVs and video recorders we want to stream video over our computer network, and project the images in large format. We will digitise live programmes such as foreign language news broadcasts from satellite TV and store them on a video server. We will store commercial video clips relating to many aspects of the curriculum on the video server and our teaching staff will link these via hyperlinks to their schemes of work. We will record our own videos of lessons for students who cannot be present, or for use in our family of schools. To enable the whole to be easily accessible, we will develop a menu system so that teachers can easily locate what is available, both within school, and at home via their Digitalbrain accounts.

### **What were your original aims?**

I aimed to improve the teaching and learning in my school where I am Deputy Headteacher and an ICT teacher, by investigating how the availability of continuous access to a dedicated classroom based ceiling mounted digital projector, which can access rich media, can improve learning in ICT. Through researching my own practice, I wanted to develop a greater understanding of how my inquiry is influencing, and is influenced by, the community of inquiry at Hayesfield School.

In particular I wanted to investigate the setting up of a network-based video server, for the storage of digitised video clips, and the building of this bank of resources for easy access over the network. In some cases, planning and previewing of materials could be done from home using the school's Digitalbrain accounts.

I wanted to find out the following:

- Does easy access to high quality visually stimulating digital materials increase their use in lessons?
- How easy is it to use digitized video over a school network?
- What type of material is best suited to this method of delivery?
- Can video clips be linked successfully to schemes of work using hyperlinks and menu structures?
- Does the use of video rich materials improve students' interest in and understanding of the subject?

I hoped the research would allow our school community to find out if this type of technology really is useful and whether it stimulates learners and makes lessons more interesting. My own research would provide a starting point for other teachers in the school so that they can have a structure to work from. If the project is successful the processes that are developed could be easily copied in other schools across the country.

### **In what way did you refine your aims?**

- To make the investigation manageable, I concentrated on a limited number of students in my year 7 ICT class
- I was not able to compare students in lessons where there was access to digital projectors, to those students who did not have lessons involving digital projectors, because most students were receiving some regular contact with digital projectors from different teachers in the school.
- I did not focus on the linking of materials to schemes of work using hyperlinks, because the school network structure did not easily facilitate this process.

### **Which research processes did you find helpful?**

1. With my colleagues and my research mentor I developed questionnaires and focus group interviews to enable understanding of students' perceptions of the use of digital projectors in my lessons.
2. I compared the responses of a group at the start of the project in the Autumn Term 2003 with responses of the same group towards the end of their course in the Summer Term 2004.
3. I kept a log of my work in developing these lessons so that I could assist the school to evaluate whether the extra time and expense required is cost effective.
4. By developing my inquiry as part of a community of teacher researchers, I benefited from the critical engagement with other teachers and, collectively, we supported each other to improve our classroom practice.
5. I evaluated the outcomes in relation to measures of pupil understanding, supported by critical engagement with my Research Mentor, Sarah Fletcher.

### **Which research processes did your pupils find helpful?**

1. Answering questionnaires
2. Taking part in a focus group and producing a video with my Research Mentor, Sarah Fletcher
3. Working in groups and discussing their progress
4. Presenting their ideas to the whole class
5. Learning alongside their teacher

### **What were the learning points you gained from undertaking the research and what**

## **were your findings?**

### Outcomes for teacher researcher:

- A wider understanding of how digital technology improves teaching and learning.
- A wider understanding of the needs of teachers in using these digital technologies.
- A better understanding of the nature of my own professional learning and the ways that, through working with colleagues, my practice develops. This will help me to develop my practice more effectively in the future.

### Outcomes for my students:

- Students have greater interest in and understanding of the subject.
- With increased enjoyment of the lessons, students' motivation in the subject increases and should feed through into higher achievement.
- A wider understanding of the needs of teachers in using these digital technologies

### Outcomes for Hayesfield School:

- Contribution towards the realisation of the vision of our school as an integrated community of inquirers, focused on improving learning.

### **Findings**

- On the basis of my previous professional experience as an ICT teacher, I found that it is possible to successfully incorporate this type of lesson delivery into most lessons.
- There are difficulties in setting up the equipment and making sure all aspects of the technology work.
- There is a requirement for good ICT technical support and time to check material before lessons.
- The research helped me because I learnt how to incorporate media rich materials into my lessons.
- Overall teachers' views were that:
  - It is easier to manage the class using a digital projector compared to using a TV
  - It would make a major difference to how teachers planned lessons if every room taught in had a digital projector
  - It can take a long time to set up the connections from the laptop to the projector
  - The digital projector encourages teachers to try more visual approaches to learning
  - The digital projector makes lessons more interesting to teach
  - Using the projector improvises the pace of lessons
  - Using the projector makes it easier for to explain difficult concepts
  - The projector promotes the revisiting of ideas in different ways
  - Using the projector allows the presentation of computer based images as an alternative to taking the class to the computer room
  - Students seem more focussed on what they are seeing compared to using a TV
  - Students do not find the projector boring
  - It would make only a small difference to learning if teachers had an interactive whiteboard as well as the projector
  - The digital projector makes lessons more interesting for learners
  - Students can demonstrate their work to others using the projector
  - Preparation of materials for the digital projector encourages teachers to put items on the network for students to use at other times
  - It is much better for students to see other students from their own school, (Hayesfield School) doing things on screen, compared to seeing any students
  - Teachers are more likely to show a short section of video on the projector than use a video tape and TV
  -
- Overall students' views were that:

- When the teacher uses the digital projector it makes the lesson more interesting
- They would like the teacher to use the digital projector in class roughly every other lesson.
- When they see things projected, it is easier to understand.
- The 3 most popular things they would like the teacher to use the projector for are:
  - the internet
  - video clips
  - DVDs.
- Overall, the 2 most popular views on the use of digital projectors in lessons are that they “help learning”, and are “interesting”.

### **What evidence relates to this learning and your findings?**

- Questionnaires from which I collected qualitative data on students’ perceptions at the start and end of the year.
- Completed questionnaires from colleagues using digital projectors to find out their perceptions of using them and how they assist teaching and learning.
- Video recording of discussions of KS3 students discussing their impressions of the use of digital projectors in lessons, followed by editing of the videos and partial transcription of the interviews
- I have used the data projector for every lesson of my year 7 ICT, year 8 PLATO, year 10 ICT and year 10 Applied Skills ICT classes. This has mainly been for demonstrating the work to be done next by students’ on their computers.
- Software used has been Powerpoint, Excel, Word, Internet Explorer, PLATO.
- I have also used the projector for my Master Class in Digital Photography demonstrating the use of Photoplus 8 software.
- I have used the projector in whole school assemblies and year assemblies to show clips of DVDs and also to use live internet pages.
- I regularly prepare lesson outlines at home and upload to my Digitalbrain webspace so that I can project this lesson outline to my class in school.
- Access to materials has been made via links on our Digitalbrain front page. These materials have been the Thomas Telford online curriculum materials, Clipbank materials, and PLATO.
- An M drive has been created on the school network where large video files have been placed (large versions of some of the Channel 4 Clipbank materials).

### **What are the questions for your future practice?**

- How can I make it quicker to set up the laptop with the projector?
- How can the materials available be catalogued and organised efficiently so as to promote their use and encourage sharing with colleagues?
- How can we simplify the booking and recording of video material from our networked satellite link?

### **What are the questions for your school?**

- Does the use of digital projectors make a quantitative difference to the performance of students exposed to this technology, compared to students who were not exposed to digital projectors in their lessons?
- How best can Hayesfield School Technology College continue with its work as a Learning Centre and how can other colleagues becoming involved in Action Research  
How can we extend the use of digital projectors across the school and share good practice?

## **Are there any questions for further research?**

Are examination results improved as a direct result of increased and more effective use, of digital projectors?

## **How did you disseminate your findings with others e.g. within your school, other schools, the LEA, wider?**

- Presentation at school INSET sessions
- Presentation to Governors' committee meetings.
- Participating in Workshop sessions with colleagues
- Presentation at faculty meetings
- BPRS case summary submitted
- Dissemination through <http://www.TeacherResearch.net>