

# Classroom as Crucible and Catalyst: Case studies in pedagogy and praxis developing and supporting visual learning

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**Abstract:** This project builds on the existing 2008/9 WLE project 'Seeing the Meaning: the use of Display Technologies to Enhance Teaching and Learning'. Classroom examples of best practice were videoed and uploaded to the Visual Learning website <http://mirandanet.org.uk/visuallearning/>. The 'Seeing the Meaning' resource has been expanded to include a number of video case studies, together with practitioner analysis. Practitioners were interviewed about the pedagogical and theoretical underpinning of their use of innovative technologies for visual learning, and the ways in which they disseminated and embedded their innovation both within their own schools and across the wider educational community. From these a typology has been developed examining the ways in which the classroom, the institution and wider collaborative networks are both used and developed as sites for innovation, learning, partnership and collaboration.

## Background

During the past ten years governments and education departments across the world have invested significant sums of money in a range of whole-class visual display technologies such as data projectors, interactive whiteboards and visualisers (Cuthell, 2005a; 2008). There have been many reasons for their adoption: the technologies have been seen as a way of meeting government targets for ICT implementation, for providing access to the latest educational resources or as a way of transforming and modernising the outcomes of educational systems (Cuthell, 2005a). The high capital cost of these technologies has meant that individual teachers and schools have rarely been able to specify or select the tools for themselves. One result of this has been that the technologies, and the changes that they produce, are often seen by teachers to be externally imposed on them and their classrooms (Cuthell, 2006). Staff development is often limited to a brief instructional session that focuses on basic 'mastery of the controls', rather than an exploration of how the tools can be integrated into teaching and learning (Moss et al, 2007).

However, expectations of these technologies are artificially high, and researchers are often pressured to produce findings that justify the high capital investment. Assumptions that the introduction of a new technology will per se achieve pedagogical change and an improvement in learning outcomes are difficult to substantiate through research, and research findings are often lost by politicians and misrepresented in the media (Kennewell, 2006). Many surveys produce results that are limited by respondents being given neither enough information, intellectual space nor time to make a useful judgement or evaluation of visual display technologies and visual learning (Smith et al, 2007).

This paper describes a project at The Centre for Excellence in Work-Based Learning for Education Professionals (WLE Centre) at the Institute of Education, University of London that provides the opportunity to draw together a number of studies and assign a developmental typology of visual learning implementation and approaches to provide a unique resource to support further research and professional pedagogical development.

The Centre for Excellence in Work-Based Learning for Education Professionals (WLE Centre) at the Institute of Education, University of London, is an initiative to encourage excellence and innovation in Higher Education. The WLE Centre aims to develop new approaches in work-based learning through facilitating

innovations in learning at work and through professional practice; teaching and assessment modes for work-related and work-located learning; uses of e-learning and digital technologies and developing new conceptual and theoretical approaches to work-based learning.

Current literature in the use of technologies that support visual learning tends to focus on the evaluation of government-supported initiatives to embed visual display technology in classrooms, the their impact on pedagogy. Averis, Glover and Miller (2005) examined IWB technology within the mathematics classroom; Cuthell (2005; 2006; 2008) examined IWB and visualiser use and their impact on teaching and learning, both in a UK and international context. Kennewell (2006) drew together research and examined the impact of the technologies on pedagogy. Smith et al (2007) and Moss et al (2007) conducted detailed studies nationally (Smith) and across London (Moss). Whilst some of these studies focus on the pedagogies and perspectives of the teachers there are no case studies accompanied by practitioner commentary that provide exemplars of practice of material for analysis. It is the aim of this project to provide just such materials.

The 2008/9 WLE project 'Seeing the Meaning' combined a metastudy of existing literature on the technologies of Visual Learning, an evaluation of effective models of pedagogical and curriculum development through professional learning and case studies, some of which were streamed video. A particular focus was on the ways in which work-based learning can support curriculum and institutional change.

The online multi-modal resource relates to the policy, theory and practice of all aspects of Visual Learning and brings together academic studies from international research; policy and best practice disseminated through Becta and other government agencies; case studies focused on classroom best practice and innovative technologies from industry. This is freely available online and forms a growing knowledge base for academics, students, schools and teachers. The project also provides video evidence that links to other work-based learning projects.

The 2009/10 project builds on 'Seeing the Meaning' with a range of downloadable video resources. These examine that ways in which practitioners and their pupils use a range of innovative visual learning technologies and techniques in the classroom and focus on the ways in which they can support learners in a range of activities and outcomes. Video interviews explore the pedagogical and organisation strategies embedded in practice, and the ways in which these can support curriculum change both with and across institutions.

The case studies focus on classroom best practice and the integration of innovative technologies from industry. An important element is the ways in which teachers use the technologies and affordances of their personal learning networks – wikis, FlashMeeting, Twitter, MirandaMods and unConferences – both to advance their techniques and strategies and obtain feedback from critical friends.

'Seeing the Meaning' is a freely available online knowledge base for academics, students, schools and teachers. The project links to other work-based learning projects, and identifies:

- a range of pedagogical strategies to support and reinforce Visual Learning;
- the ways in which it can be integrated across age-related curricula;
- models for deployment across institutions;
- the integration of Visual Learning into assessment practice;
- the role of work-based learning to support the integration of visual learning technologies into existing and developing pedagogical practice;
- learner perceptions of the impact of visual learning on personal learning and progress;
- the use of personal learning networks as a forum for development and dissemination.

Key issues of visual learning, its technologies and its pedagogies are illustrated, both in the video case studies and the practitioner commentaries. They explore and develop the relationship between technology, theory, pedagogy and learning; the relationship between work, learning and professional practice and the relationship between pedagogy, assessment and visual learning.

This project enhances the existing investment by the WLE Centre in 'Seeing the Meaning' and provides a resource for all those wishing to use findings and information on the subject of visual learning and its technologies to further their own professional development, or to implement it in the workplace. This project links to, and supports, the WLE aims of identifying and exploring:

- the relationship between work, learning and professional practice with a particular focus on work-based pedagogies, assessment and self-evaluation strategies;
- the relationship between pedagogy, assessment and learning with innovative technologies;
- the role and use of new technologies (especially those of learners) across a range of curriculum areas;
- conceptualising and theorising the workplace as a site for learning, and the relationship with industry;
- collaboration, partnership and innovation within and across institutions through personal learning networks.

## Methodology

The initial call for, and selection of, participants went out on a range of networks: MirandaNet; EdTechRoundUp; Google Teacher Academy; Twitter and other linked personal learning networks. An initial focus group of 20 participants was chosen representing a range of key stages and curriculum areas. Permission was sought for collaborating institutions for filming and dissemination,

Initial interviews took place using a range of online collaborative tools: FlashMeeting; GoogleMail Video; Skype and the project wiki. Personal profiles were written by each participant, detailing the range of tools, technologies and strategies used to support visual learning, pedagogical approaches and evaluation and dissemination techniques. School visits were arranged to film participants in class and to record interviews.

The video and audio materials were edited, categorized and uploaded to the Visual Learning website. A typology was constructed from the case studies, and an analysis forms an important part of the resource.

## Typology

Maddux (1991) classified educational computer applications as either Type 1 or Type 2. Type 1 applications simply reinforce existing teacher-learner paradigms, whereas Type 2 applications of ICT (or EdTech.) transform teaching and learning. Many teachers now think of ICT applications in terms of Web 2.0 or even Web 3.0, although whether the concept of the semantic web is one that had been fully grasped, let alone implemented, is still to be resolved. The Web 2.0 affordances, on the other hand – information sharing, collaboration, interaction and the creation of personalised content – form the basis of what Maddux referred to as Type 2 applications.

The features of these case studies that demonstrate the transformation of teaching and learning from the conventional teaching and learning paradigms – of information transmission, practice and assessment – are grounded in pupil participation and autonomous learning. These features are:

- Learner involvement
- Creativity
- Personalisation
- Collaboration
- An awareness of audience
- A wider audience than that of the teacher – the class; home; a global audience.

These are the transformational elements. Visual learning and the process of visualisation play a critical role in cognition. Pupil understanding of the What and Why of the work they have undertaken is reinforced by visualisation, and through language, in the explanation of the learning process.

## The case studies

A number of the case studies look at the ways in which concept maps can be used to facilitate learning. Four short studies look at the ways in which Mindmeister (<http://www.mindmeister.com/>) can be used collaboratively, both at school and at home, to support and extend work in the curriculum. The key affordances brought by the use of concept mapping programs in the classroom are learner involvement, collaboration and an awareness of audience.

### Mindmeister

#### Mindmeister case study one.

Pupils explain how they use MindMeister to support group collaboration for revision topics.

### **Mindmeister case study two.**

One of the features of the program is the way in which resources can be added to the map. Here a pupil talks about adding hyperlinks to documents.

### **Mindmeister case study three.**

The process of knowledge building as part of the map is explained: notes can be added to nodes of the map to explain and extend particular points. There is a conversation about the need to check the integrity of information sources.

### **Mindmeister case study four.**

These sources can then be integrated and shared between the other contributors to the maps.

## **Bubbl.us**

Bubbl.us (<http://bubbl.us/>) is another online concept mapping program that some schools use to support the curriculum.

Pupils explain how they use Bubbl.us to build revision notes. They can share them with their peers, and easily convert them into an essay or report.

## **Posterous**

Innovative ways of producing text encourage pupil involvement through creativity, collaboration and a sense of a wider audience for their work. In one case study pupils explain how they use Posterous (<http://posterous.com/>), email/blog software, for revision in History – and to produce documents other than conventional school essays. Pupils work collaboratively, access the program from home and can show their work to their parents. Posterous is described as ‘a dead simple way to put things online’.

## **Modern Foreign Languages**

Two teachers talk about ways in which they use animation programs to support Spanish language classes. Jose Picardo, is a teacher of Spanish in a secondary school, who uses animation with his pupils to encourage them to use Spanish creatively. The short clip demonstrates the ways in which his pupils are motivated to work creatively at school and at home. Lisa Stevens is a Primary class teacher, a Modern Foreign Languages specialist and an enthusiast for embedding innovative technology in the teaching and learning process. She explains how she uses Voki (<http://www.voki.com/>) – an avatar that talks, for children to record their voice – not only for Spanish, but also for recording poetry. It is also used for peer and teacher assessment purposes.

She uses VoiceThread (<http://voicethread.com/>) to enable pupils to add their voices and other sound to a wide range of programs. Lisa talks about the ways in which the interactivity of ‘Web 2.0’ contributes to the wider educational development of her pupils – and is approved by their parents – as well as supporting mainstream curriculum areas.

There are three interviews with groups of primary pupils that form the basis of these case studies. In the first, members of the class explain how they use PowerPoint and VoiceThread to add sound to group presentations. More detailed explanations are provided by pupils of the techniques – and advantages – of using VoiceThread and other interactive programs. Boys then explain how they use Voki to create avatars and record their voices for poetry, and for Spanish – and how they set up their own closed version of Facebook. For these pupils, therefore, all of the elements identified in the typology are particularly powerful: Learner involvement; Creativity; Personalisation; Collaboration; An awareness of audience; and wider audience than that of the teacher – the class; the home and a global audience through international links.

## **Creating a Virtual World**

A.L.I.C.E. (<http://www.alice.org/>) is a 3D programming environment for the creation of an animation for telling a story, playing an interactive game, or a video to share on the web. It is described as a free teaching tool that allows students to learn fundamental programming concepts in the context of creating animated movies and simple video games. In A.L.I.C.E. 3-D objects (e.g., people, animals, and vehicles) populate a virtual world and students create a program to animate the objects. A.L.I.C.E. is free open source software: the A.L.I.C.E. project is based at

Carnegie Mellon University. In this excerpt pupils describe how they use the program to create their own games and virtual worlds as part of their ICT programme of study. This, and the use of Open Sim, reinforce learning through Learner involvement, Creativity and Personalisation.

### **Educators in Virtual Worlds on Open Sim – the pioneers...**

Leon Cych has been exploring the use of virtual worlds in education for some time. Here he reflects on the impact this could have on the ways in which young people learn and work.

*“The future is here and it will serve the V Generation - the 5 year olds and upwards who currently use sites like Club Penguin and Disney Fairies and any number of the 200+ Virtual Worlds out there at home who will have much higher and more pronounced expectations of any future education system that they will enter and pass through in the next 10 - 15 years.*

*Global research firms such as Gartner have a very good understanding of how this use is beginning to work -*

*“Generation V is the recognition that general behavior, attitudes and interests are starting to blend together in an online environment.”*

### **What happens when you give a class of 8 year-old children an iPod touch each?**

The most powerful form of learning is autonomous, when the technology enables pupils to become independent learners, to undertake and achieve things that would never have been possible without the enabling technology. This examples shows the impact on a primary school classroom when all the pupils in the class were provided with networked iPod touches. The possibilities of Type 2 applications of ICT, identified in 1991 by Maddux, are now part of the reality of these 8 year-old children.

One primary school decided to equip a whole class with iPod Touch devices. The class teacher, head teacher and pupils discuss the project, and how they use the iPods. One of the many things that’s inspiring is the language the children use to describe the processes they use.

Leon Cych (<http://www.l4l.co.uk/>) wrote about the project when he visited in the primary school some two weeks after it started.

*“The wonderful thing about my job is that I have a network of people I can visit who are involved with prototyping the use of new technologies in education. My latest outing was to a Junior School with a difference this week. Peter Barrett, an old colleague of mine, had told me about the seed of this idea some months back. Knowing Peter I guessed it would be quite ambitious. We have worked on a number of innovation projects in the past and he never fails to surprise me...*

*As well as the school going through a massive rebuilding programme, they have also introduced a set of iPod touches into one year 4 class, for each child, to see what happens. All the touches are networked through an Apple Airport Extreme and out onto the internet through the school’s connection. It is not every day you see this sort of thing. So I offered to pop along and make a video of their progress after a couple of weeks. In the first week that the children have had them, they seemed to be quite at home using the applications and devices - but it’s early days... Here is a brief video record of reflections and practice of that use...”*

### **Making the news**

The final set of videos was produced by four groups of pupils, who whilst on courses at their local City Learning Centres, learned a range of techniques that they would need to create television interviews. They then went back into their schools, interviewed their teachers, edited and produced the television programmes. These autonomous learners were full participants in the learning progress: Learner involvement; Creativity; Personalisation; Collaboration; An awareness of audience and a wider audience than that of the teacher – the class; home; a global audience were an integral part of their achievements.

### **Conclusions**

This project identifies a range of pedagogical strategies to support and reinforce Visual Learning and the ways in which it can be integrated across age-related curricula. The online resource provides a model for deployment across institutions; it suggests ways in which the integration of Visual Learning into assessment practice can support both peer assessment and teacher assessment. These examples are very much those in which the role of work-based learning to support the integration of visual learning technologies into existing and developing pedagogical practice is critical. Learner perceptions of the impact of visual learning on personal learning and progress reinforce the need for school systems to build pupil participation, creativity, personalization, and collaboration into classroom praxis.

And the audience for our pupils must be far wider than simply the teacher assessor: it must include the class, the home and their peers across the globe.

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