

From comparative viewing to non-linear learning with pictures: using multi-display environments in higher education

Katharina Lorenz, Brett Bligh, The University of Nottingham

katharina.lorenz@nottingham.ac.uk; brett.bligh@nottingham.ac.uk

Abstract

While recent and complex technological methods for the display of information in classroom settings have drawn attention to visual learning and its application within learning spaces, it can be argued that, within humanities contexts such as archaeological and art historical teaching, disciplinary methodology has been explicitly linked to the technical means of visualisation for at least a century. Drawing upon a year-long exploratory project with an undergraduate Classics cohort, our aim here is to discuss the methodological impact, within picture disciplines, of the use of a Multi Display Environment by tutors and students, and to consider the impact of the resultant new learning scenarios upon a deeply embedded and strongly interpretive learning culture.

Overview

Multi-display systems is a collective term used to describe a set of new technologies which allow for the simultaneous display of multiple pieces of information, and the flexible non-linear navigation of that information during presentation. They are seen to have interesting, emerging pedagogic affordances within certain learning situations, especially in terms of their perceived potential for student engagement and increased group interaction (Bligh, 2009). The Thunder systems used as the basis of these investigations is an obvious example of such a system. Consisting of a central easel designed to look like a “flipchart”, with digital versions of pens, erasers and other input devices, and a series of large projected screens designed to mimic the effect of flipchart pages being “hung” along a wall, the system is seen to present pedagogical advantages in terms of simultaneous display and non-linear presentation (Bligh and Li, 2009). Such systems, also called wall-sized displays, are seen as a plausible avenue of future innovation in learning spaces (Anderson, 2006), although the evaluation of such scenarios in terms of learning methodologies is a rarity (Pearshouse et al, 2009).

Conversely, archaeological and art historical teaching and research have always been directly linked to the technical means of visualizing the material cultures at the core of these disciplines. When analogous slide projection was introduced into these disciplines, art-historical knowledge had to be specified and refined. The Swiss art historian Heinrich Wölfflin answered this new challenge to the discipline in a twofold way: he introduced double-projection in order to facilitate vis-à-vis or comparative viewing, and he provided the methodological backing for this strategy as the most

successful way of approaching visual art in his study *Kunstgeschichtliche Grundbegriffe*, in which works of art are analyzed by means of five pairs of dual opposites (Grimm, 1892/1981).

Recent and profound changes in the classroom visualisation technologies in art-historical disciplines have certainly not received the same form of methodological reflection: the move from double-projection to PowerPoint or equivalent linear digital presentation technologies is now complete, and analogous slide projectors have disappeared from classroom use, but the effects on teaching and learning, especially in terms of the changes of narrative knowledge and analytical frameworks enforced by the affordances and constraints of these systems, is not well understood (Susskind, 2008). For disciplines whose heuristic success is so closely bound to their ability to visualize their findings, this lack of understanding poses considerable problems.

Our study was a year-long interdisciplinary collaboration, supported by the Visual Learning Lab, a Centre for Excellence in Teaching and Learning, and bringing together a Computer Scientist with an interest in technology enhanced learning with a Classicist whose work centres around visual cultures. We set out to investigate the impact of two visual learning scenarios — one involving the use of the Thunder Multi Display Environment system in a newly refurbished open access learning space, and one involving the use of established PowerPoint and projector technologies in a conventional seminar room — upon teaching and learning within a Visual Mythology module. The lecturer first used the systems, demonstrating their principles and providing exemplars of presentation construction, element juxtaposition, dealing with interactivity, and using live annotation. In this way, the students explored the two systems first as audience, and then as active users, in classroom discussions and in their own presentations. All sessions were filmed, and the experiences with the two systems were evaluated by both students and staff.

One of the most striking results of the study was that the students voiced a clear preference for the Multi Display Environment scenario with regard to exploring previously unknown visual material and harnessing it as part of a wider framework of knowledge in the lecturer-led situations. Conversely, most showed considerable anxiety towards non-linearity with regard to their own presentations, and they preferred to present with the one-projector linear visualisation system and its seemingly more familiar technology and structural demands.

Compared with the Multi Display Environment, it was clear that the PowerPoint-based scenario enforces a prefabricated choreography and is unable to account for comparisons or connections which are part of or result from classroom discussion. Furthermore, while comparison is often an aim by virtue of slide construction, the reality is slides crammed with arrays of pictures, text and sounds, confounding clear comparative viewing.

From a teaching perspective, the Multi Display Environment can bypass this linearity and subduing of comparative viewing, while further allowing learners to move beyond the analytical confines of double-projection: with their ability for changeable and extendable visualization, the systems provide a means to showcase the interdependencies and pervasiveness of visual culture. In doing so, simultaneous systems finally succeed at illustrating precisely those networks of meaning, informed by semiotic or visual culture studies, at the core of current scholarly interests in visual disciplines. They also enforce refinement of those analytical methods currently used to pursue these interests in order to survive the uncompromising light of multi-projection, in ways made accessible to learners through technology.

References

- Anderson, P. (2006) The future of human-computer interaction. In: Becta (eds), *Emerging Technologies for Learning*, p24-31. Coventry: British Educational Communications and Technology Agency.
- Bligh, B. (2009) On multi-display classroom systems: the affordances and constraints of simultaneous display and non-linear presentation for students and tutors. *International Conference on Education and New Learning Technologies (EduLearn09)*, Barcelona, Spain.
- Bligh, B. & Li, S. (2009) On the use of a multiple display, in-room collaboration system to promote free response formative discussion between learners and tutors in small group seminars, *International Technology, Education and Development Conference (INTED2009)*, Valencia, Spain.
- Grimm, H. (1892/1981) Die Umgestaltung der Universitätsvorlesungen über neuere Kunstgeschichte durch die Anwendung des Skioptikons (1892). In: W. Kemp (ed), *Theorie der Fotografie I. 1839-1912 (1981)* p200-205.
- Pearshouse, I., Bligh, B., Brown, E., Lewthwaite, S., Graber, R., Hartnell-Young, E., & Sharples, M. (2009) *A study of effective evaluation models and practices for technology supported physical learning spaces (JELS): final report*. Bristol: Joint Information Systems Committee.
- Susskind, J.E. (2008) Limits of PowerPoint's power: enhancing students' self-efficacy and attitudes but not their behaviour. *Computers & Education* 50: p1228-1239.