Chapter 1
Interactive Whiteboards: A Literature Survey

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ABSTRACT
This chapter reviews the literature that has charted the progress of the use of interactive whiteboards within schools, predominantly within the UK. It is concerned, firstly, with the way in which change is introduced, managed and supported. The literature has also shown the progress from presentation and motivation issues to a consideration of the pedagogic possibilities of the integration of the interactive whiteboard in teaching situations. This involves an understanding of interactivity in educational contexts. This chapter also investigates the value for money issues implicit in the use of technology in pedagogic change and considers discussions related to technology and educational effectiveness.

INTRODUCTION
This is not a unique literature survey. Higgins et al. (2007), Cuthell (2007) and Glover et al. (2005), among others, have considered the emerging research literature into interactive whiteboard use and established typologies of introduction and use, developed the research rationale for classroom practice and pointed to the need for pedagogic change to accommodate the affordances offered by the technology. Smith et al. (2005) offer a more critical review of the literature pointing to the methodological problems arising from considerable case-study research of a narrative nature which is frequently less than objective when undertaken by teachers who are convinced of the potential of IWBs. Slay et al. (2008) suggest that within developing countries there may be greater economy through the use of a data projector and screen than by using IWB technology. Our literature review makes no methodological judgments but draws on the growing body of published research in the various areas related to IWBs as a background to understanding trends in the practice and pedagogy of interactive learning. It follows the introduction of new technology into schools and colleges and looks at the way in
which some teachers and researchers move from its use to enhance presentation and motivation to awareness of the need for changed pedagogic approaches.

Interactive whiteboard systems were developed experimentally in the 1980s largely in higher education law and medical faculties in the United States using an approach from the commercial world (Greiffenhagen, 2002; Murphy et al., 1995; Armstrong et al., 2005; Passey, 2006). Within two decades their use has spread throughout all sectors of education around the world. Most of the early commentators on IWBs (see for example, Greiffenhagen, 2000) begin with a description of the systems involved reflecting the need to inform readers of the technology. Later writers such as Hennessy et al. (2007) update this approach with an element of evaluation as follows:

Interactive whiteboard systems comprise a computer linked to a data projector and a large touch-sensitive board displaying the projected image; they allow direct input via finger or stylus so that objects can be easily moved around the board (‘drag and drop’) or transformed by teacher or students. They offer the significant advantage of one being able to annotate directly onto a projected display and to save the annotations for re-use or printing. The software can also instantly convert handwriting to more legible typed text and it allows users to hide and later reveal objects. Like the computer + data projector alone, it can be used with remote input and peripheral devices, including a visualiser or flexible camera (e.g. to display and annotate pupils’ paper-based work or experimental results), slates or tablet PCs. (p. 2)

The technology may have become part of the information and communication technology armoury of schools but research into the way in which it has been introduced offers pointers for those seeking to introduce new technologies in general. Glover and Miller (2002) in considering the introduction of change within a local authority, a secondary school and five primary schools, identified three main types of user: “missioners”, who were convinced of the potential of the technology; “tentatives”, who were ready to consider change; and “luddites”, who, for a variety of reasons, refused to accept or use the technology. At the same time Burden (2002) suggested an alternative process approach with three stages: “infusion”, when a small number of teachers become interested in using the technology; “integration”, when more become involved and attempt to extend its use; and “transformation”, when the technology impacts on teaching. Cuthell (2006, 2007) extends this analysis by examining the process of changing practice working from an iterative stage where teachers do the same thing but in different ways, through the development of innovative materials and approaches, to changes in student and teacher collaborative working. As the use of the technology has been more widely accepted, associated research into effective use has moved from purchase and use, to pedagogy and classroom practice. This transition has been traced by Cuthell (2007), who notes the progression from the pioneer phase (Smith, 1999; Gerard et al., 1999; Levy, 2002; Goodison, 2002), through the larger scale studies of enhanced effectiveness (Beauchamp & Parkinson, 2005; Stein, 2005; Cuthell, 2005a, 2005b), to the development of enhanced interactivity and pedagogic change (Higgins et al., 2005; Miller & Glover, 2006a; Cuthell & Preston, 2007).

TECHNICAL ISSUES

The potential of IWB use - and hence the willingness of teachers to use it as classroom equipment - was based on a number of affordances, or more simply, tools of the technology (Kennewell, 2001). Kennewell and Beauchamp (2007), summarize research evidence and suggest that the benefits of IWBs spring from their suitability for whole
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