

Recent work in the United Kingdom has begun to question the effectiveness of the interactivity being promoted by IWBs in classrooms. Reports from 2002 showed that only a few teachers used the interactive features of the boards, while others absorbed the technology into their standard pedagogical repertoire and used it as a display tool only. A group of UK researchers, concerned about the quality of interaction arising from use of the interactive whiteboards, developed a hierarchical interactivity tool, which they used in case studies. They concluded that “the advent of the IWB may be seen as a backward step, in that it gives a new impetus to traditional, teacher-centered, approaches”. The reasons lie in the low level of interactivity used by the teachers, with high level of teacher control, rigid scaffolding and closed questioning with stylised teacher responses.

As a response to the unease at the pedagogical uses of technologies a number of researchers have developed models to analyse pedagogical strategies and skills. However most of these tools that have been used to analyse pedagogies when teachers are using technologies, have a built-in value judgment. Some Becta authors wrote of a progression of teacher practice, implying a range from low to high value...

In the study at Mooroopna Secondary College it became clear from the data collection that a less judgmental analysis tool would be required. In addition, no model available to the researchers would give a complete picture of transformations as the teachers worked with the technology. Most models were skills based, and while teacher technology-use skills give a partial picture of the way that pedagogical activity is undertaken, knowledge of skills fails to understand or observe pedagogical thinking and change.

For the Mooroopna study two models have been adopted, both new, but both draw upon previous insights. Two frameworks, those of the TIMMS study (Clarke 2006) and Beauchamp’s (2004) transition framework proved to be the most useful in informing a new tool which has been called a “Hierarchy of Pedagogical Strategies”, or HoPS. The HoPS borrows Beauchamp’s ‘substitutional’ and ‘synergistic’ categories as the outer extremes of a range of styles, but introduces other headings (experimental, interactional) that reduce the judgmental nature of labels. The actual instrument examines teachers’ skills, ICT usage and management. As a single instrument it becomes too unwieldy to incorporate pedagogical strategies such as questioning, task making and student action. A second instrument has therefore been developed, based on the pedagogical framing concepts introduced by Bernstein (1990). This framing model adopts Bernstein’s concept of teaching strategies that range from highly controlled (‘strongly framed’) to ones that closely involve the students (weakly framed), with intermediate framing levels in between. It and interprets some of Bernstein’s criteria to create a rubric by which to test the framing strength of lessons. This has similarities to the Tanner et al. interactivity model, but the framing model deals not only with obvious interactivity, but also with teacher task making, teacher questioning, and student actions. Of itself it is not judgmental, although in its original form there was an element of judgment in Bernstein’s use of the framing concept.

**The next few paragraphs relate to two teachers, here named Ester and Debbie.**

The use of two instruments for the analysis of the pedagogies employed by teachers at this school has given a greater insight to the changes associated with the technology than the use of a single tool. In the case of Esther, the framing analysis shows that her strategies are teacher-centric, that she has controlled the entire lesson and its discourses and dialogues. It could be assumed that the technology has made no discernable difference to either the teaching or the learning that has taken place compared with a non-IWB classroom. The HoPS instrument tells a slightly richer tale. It does not analyse the criteria that determine pedagogical strategies, and gives a substitutional result to classroom management, but it shows that in *teacher skills*, and in *ICT usage* there has been a shift from the substitutional level. Esther is not using the IWB as a conventional board or screen. She has adopted affordances of the IWB, not to alter her pedagogical stance, but to enhance the way her material is presented to the students. In post-lesson interview, Esther claimed that this was a direct result of what she had learned from her mentor.

In similar fashion, although Debbie is shown as strongly framing her pedagogy for much of the LOTE lesson, HoPS reveals experimental use of ICT skills and usage, and sometimes beyond that to interactional use (involving the students). Later in the lesson, she continues to use these techniques, but the framing instrument indicates she weakens the framework, and begins to use open questions and accept open answers. Thus each instrument has given additional information about the ways that the technology is interacting with the teaching.

As the year progressed, the researchers analysed many lessons where framing was weakened. Debbie, for example, set a project for a Year 8 class in which she invited them to prepare a multimodal product for use on the IWB by the class, incorporating an Indonesian spoken narrative. This involved activities which were both synergistic in the HoPS instrument, and weakly framed level 5 on the criteria for the framing instrument.

However, there were several other important observations that arose from working with both instruments.

1. It became clear with many teachers that as they matured with their use of the IWB technology they regularly changed framing levels within one lesson. However the HoPS analysis of those same lessons often revealed that the episodes with strong framing often displayed expert use of the technology and high level teacher technology skills when the teacher used the multimodal affordances of the IWB software such as image manipulation, spotlight tools, image capture, sound video and animation to enhance a section of the lesson that was wholly instructorist. For example, [Author reference to be added] described Nicolas who began an art lesson on PopArt with a multimodal display of art works, spoken commentary and animation devices as he instructed a passive audience about the art genre. In the framing analysis this appeared as strongly framed with a teacher dominated

task and closed questions. In the HoPS it appeared as high level teacher skills and ICT usage. Later in the same lesson, students were invited to use the technology to transform their own photographs into pop-art style pictures, a weakly framed activity handing control to the students. From such observations the conclusion was drawn that as teachers become aware of the affordances with IWB technologies, they can use them flexibly and differently according to the pedagogical needs of the moment in the lesson. In this study the key to rapid change to making skilful use of the IWB affordances within a weakly framed pedagogy appeared to be the constant support from the two peer mentors

2. Use of the mentors followed a pattern. It began with pre-lesson planning; encouraged experimental use of techniques; and extended to accepting mentors as team teaching members or merely safety-net back-up in early lessons. Finally, the teachers cast off from the mentor support as they became confident enough to dare to use the boards in innovative ways.
3. Early lessons were almost always mirrors of largely instructionist non-IWB lessons but using the affordance to enhance presentation. In nearly every case of multiple use following mentoring, the teachers changed their pedagogical stances to weaken their framing, sometimes very substantially, just as Debbie did. These changes were able to be recorded and understood through both tools.

### **Our concluding thoughts**

The use of effective analysis instruments is a key part of understanding the rich tapestry of action and interaction in the natural classroom, and must be so if we are to understand the complex relationships between technology and pedagogy. There has been much disquiet about this relationship, including the use of interactive whiteboards. Unlike many UK studies, the researchers in the Mooroopna study found a positive relationship and complex changes in the way teachers employed strategies as the IWBs were introduced. There were very few lessons in which substitutional use of the boards was observed, and many cases where teachers moved to synergistic use involving student development, and weakening of the pedagogical framing to allow student engagement. The only significant difference between this school and most others in the introduction of the technology was the use of peer mentors throughout the year at a high enough time-release level to be thoroughly effective as a teacher support mechanism. Teachers in interviews and surveys constantly referred to the support system taking fear of the technology and its unexpected consequences out of the classroom. What the researchers also observed was that the two mentors rapidly assumed that flexible uses and attitudes to pedagogic strategies were as important as skills, and mentored those attitudes into their work with teachers. Understandably, the teachers were reluctant in interview to admit this. It might have given the impression that their standard teaching was rigid and dull!

It became very apparent during this study that no one analysis instrument was going to allow a full understanding of the pedagogical changes taking place. This observation indicates that it is dangerous to draw firm conclusions about ICT impact without using a range of analysis tools. Hence the development of two tools, one emphasizing teacher skills and ICT usage with classroom management (HoPS) and the other emphasizing pedagogical framing features from strong to weak. This has given a greater insight to the understanding of technology's interaction with pedagogy.

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