

Working mathematically with interactive whiteboards

When The Illawarra Grammar School's Head of Junior School, Dianne Bryant, attended a conference on interactive whiteboards two years ago, she was struck by their potential for changing pedagogy. Returning to school, Dianne, together with colleague, Judi Nealy, set about shifting teachers' thinking about interactive whiteboards through a series of professional development activities. These included a re-examination of theories of learning and their relevance for interactive whiteboards, as well as initiating a school-based action learning project funded by the *Australian Government Quality Teacher Programme*. The action learning project focused on Stage 2 mathematics. Its purpose was to enable teachers to explore how interactive whiteboards could be used in everyday teaching to foster new ways of maths learning. As Dianne noted, there was little point in the technology being used as a glorified overhead projector!



Dianne Bryant, Judi Nealy, Jeff Robinson and Karen Wallace

The pilot program

The plan of action was to identify a strand within the mathematics curriculum that would be taught, and then to enhance the core program for that strand with a range of additional activities on the interactive whiteboard. Students rotated through the activities in ability-based groups. The aim was to add new dimensions to the strand, both in terms of the resources that it drew upon as well as the ways in which students interacted with those resources. The additional activities were carefully constructed to take into account various ability levels, something which was supported by the digital resources as these were often games-based with in-built levels of achievement. This structure in itself provided a lot of motivation, as students were keen to progress to the next level of a game. Digital resources from The Le@rning Federation exposed students to a wide variety of activities that can be used in working mathematically.

Student-centred learning

Teachers working with Stage 2 classes on the topic, position and fractions, found that students were comfortable with the prospect of using different digital resources. They had loaded a choice of games and sites onto the interactive whiteboard, and soon discovered that they did not need to tell the students what to do with them. Operating in a 'digital world' is second nature for students and they navigated through the activities, taking control of their own learning. Karen Wallace, a Year 3 teacher, found the shift from teacher-directed learning to student-centred learning was one of the biggest pedagogical changes brought about by use of the interactive whiteboard.

Development of meta-language

Another big change was students' use of meta-language. While learning at the interactive whiteboard, students talked to each other about what they were doing. They discussed and explained concepts, made changes, moved things backwards and forwards, rubbed things out and repeated tasks. All of this talk enhanced development of meta-language in mathematics.

Pre- and post-testing

Pre- and post-testing of students was an important part of this action learning project. With Year 4, for example, the entire grade was pre-tested on the topic of Decimals and Fractions. The results were used to design the technology-based learning activities for this topic and to divide the students into ability-based groups for rotation through the activities. For Year 4 teacher, Jeff Robinson, the pre-testing meant that the activities were truly tailored to meet student learning needs. Post-testing proved that the approach worked. Students picked up mathematical concepts *more* quickly, and these concepts were covered in much greater detail. *'There was so much student interaction. They were using the interactive whiteboard, manipulating images, moving shapes around and generating numbers. We even had each group using the whiteboard to write and deliver a lesson on fractions to a group of peers or parents. It showed they understood the concepts,'* said Jeff.