Keeping in touch with learning: the use of an interactive whiteboard in the junior school

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Recent literature on the role of the interactive whiteboard (IWB) has indicated numerous ways in which teachers make use of the IWB to support children’s learning. In these studies there is a growing awareness of changing roles in the classroom as teachers gain confidence in the use of new technologies. This study describes how a researcher worked with a teacher in a small rural school in New Zealand to document and understand the use of an IWB to enhance the learning of young children ages five to six years. The focus of the research was on how the features of the IWB supported teaching actions and provided potential and structure for the children to develop their ‘key competencies’, broadly conceptualised as the development of knowledge, skills and aptitudes for learning. Here the authors demonstrate that it was the teacher’s orchestration of the classroom environment, incorporating the use of the IWB, that was the key to the development of pupil autonomy as they learnt to take risks and to be creative in their learning with the interactive whiteboard.

Keywords: interactive whiteboard; junior school; key competencies; New Zealand

Introduction

Recent literature on the role of the interactive whiteboard (IWB) in the classroom environment has indicated numerous ways in which teachers can make use of the IWB to support children’s learning. These include, for example, that the IWB has the potential to support a more participatory pedagogy (Kennewell & Beauchamp, 2007) based on using a range of multimodal resources (Twiner, Coffin, Littleton, & Whitelock, 2010, this issue). With focused teacher orchestration, the IWB is a dynamic and manipulative object of joint reference that can support socially shared cognition (Hennessy, Deaney, Ruthven, & Winterbottom, 2007). It can help students to work together where there is a classroom ethos of collaboration and shared ideas of what constitutes productive talk in groups (Warwick, Mercer, Kershner, & Kleine Staarman, 2010). New pedagogic practices are possible because of the way that lesson plans and resources can be stored and are accessible at any time. The IWB can act as an aide-memoire, leaving the teacher free to monitor student response, use formative assessment and redirect teaching as required (Lewin, Somekh, & Steadman, 2008). In these studies there is a growing awareness of the teacher’s

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A pivotal role in guiding students by ensuring manageable goals, extending skills and providing challenge.

The study described here aimed to cast light on one teacher’s pedagogic practice and her role in orchestrating the use of the IWB for learning in the area of ‘key competencies’. The New Zealand Curriculum (NZC) (Ministry of Education, 2007) sets out five key competencies considered to be the key to students’ becoming lifelong learners and active members of society. These competencies are: Thinking; Using language, symbols, and texts; Managing self; Relating to others; and Participating and contributing.

The present study

The study arose from the Laptops for Teachers (TELA) evaluation – an evaluation of the emerging uses by teachers of laptops leased from the government (Cowie, Jones, & Harlow, 2009). One of the focus group teachers, with many years of experience teaching new entrant children and who had been using an IWB for three years, invited the researcher (first author) to visit her school to see how she used the IWB with five- and six-year-old children.

The research took a case study approach capturing classroom activities, including IWB use, over five days using a digital camera, video and audiotape recorders. The teacher and the researcher discussed the research questions, current literature, and theoretical framework for the study, beginning the process of analysis in a deductive manner (Patton, 2002, p. 453). They examined video footage of observed activities together. This resulted in a set of jointly selected, self-contained descriptive units of analysis or critical incidents that could be analysed in depth (Patton, 2002, p. 439). The researcher then focused on identifying, defining and elucidating the categories of features, potential and structure (Kennewell & Beauchamp, 2007) within each critical incident. The analysis was communicated and debated with the teacher via Skype and email, enabling the researcher to make carefully considered and validated judgements about what was meaningful to the teacher.

Findings

Two critical incidents are presented here to show how the teacher orchestrated the learning environment, including certain IWB features, to provide potential and structure for the classroom activities and to enhance the development of key competencies. During the observation week the teacher used the class’s interest in a Monarch butterfly chrysalis, which a child had brought to school for ‘news’, as focus of a cross-curricular unit for the remainder of the week. The resources available through the IWB library, together with use of the digital microscope, library visits, role play in the classroom and playground, swimming in the school pool, catching butterflies in the school garden and items brought from home, all added to the inquiry based in the Living World strand of the science learning area, at Level 1 in The New Zealand Curriculum (Ministry of Education, 2007).

The news of the day – annotating, reflecting, eliciting prior knowledge, and reinforcing new learning

During news time first thing each morning, the teacher set standards of behaviour of how to relate to others, and provided opportunities for contributing, so that each child
had a sense of belonging and gained the confidence to participate. As the teacher scribed children’s news on the IWB she made sure that she tailored the learning to the children’s abilities, inviting children to help her at the level of their ability to add a word, add punctuation, or spell a word. As individual children used the IWB, the teacher gained insights into their next steps for learning. Sometimes she used the news time as an opportunity to introduce or practise a spelling strategy such as ‘chunking’, for example ‘cat-er-pill-ar’. In effect she was modelling the use of language and strategies that would help the children to develop that ‘can do’ competency of managing self.

Ideas from the news of the day were used regularly in the classroom for reflection, as an instructional resource, re-reading for fact and inference, and for creating printed booklets. The IWB offered an extension to the learning, as children were motivated by a sense of ownership to retrieve the news flipcharts from previous days, adding to these in their story writing. The teacher used the IWB flipcharts to encourage children to draw on their personal knowledge of an event and think about their experiences enhancing their competency in both creative and critical thinking. Children could revisit and reflect on learning when the news was brought back with a ‘drumroll’ sound effect during reading time, and would illustrate their sentences on the IWB, and then read their news to the teacher, pointing out the features of the sentence when prompted. In this way the IWB became a shared interactional space that supported children’s participation and contribution, of more value than a blackboard or a whiteboard, as records could be saved and retrieved, and more flexible than a paper flipchart as accidental happenings could be erased and rewritten or redrawn.

Investigating Monarch butterflies – developing understandings, seeing connections, participating in authentic activities

The teacher believed that ‘all your pedagogies are geared towards capturing the children at this level, to support them to become life-long learners’. She used the IWB to support this focus by developing the key competencies. The entire class watched their caterpillar wriggling about when the digital microscope was hooked up to the teacher’s laptop and IWB. This ensured that all children could see the same specimen, and enabled an image to be saved for later use. The authenticity and dynamism of watching their caterpillar displayed on the IWB captivated the children and focused their attention on the different parts of the caterpillar. The children then used this information to draw caterpillars on the IWB, assisted by the teacher asking probing and focusing questions. This activity led to a comparison between caterpillar and human features (legs and feet), and to thinking about the other ‘parts’ of a caterpillar. The efforts of the caterpillar, as it wriggled about, prompted the children to contribute describing words (a language focus of the week). They composed and then participated in reciting their poem about Monarch butterflies to recall the colours and compare what they were reciting with what they were watching on the IWB.

The children were fascinated by the caterpillars growing in the classroom, making observations such as ‘Look at that fat one!’ Two of the older children accepted the responsibility for carefully carrying out measurements of all the caterpillars and for placing one under the microscope for the class to see on the IWB (managing self). By making use of the classroom digital microscope with the IWB, the teacher encouraged the children to use words such as length, motivated them to think about how they could measure a caterpillar, and helped them develop an understanding of how to use a measuring tool. Through discussion and comparison, they soon realised that using
their fingers was not a reliable way to measure something and applied their new thinking to the process of using the ruler. The number line template feature of the IWB provided structure to focus attention on the introduction of the concept of measurement and later to compare different measuring tools. This left the teacher free to provide meaningful opportunities for the children to participate and contribute, to attend to the learning, and to monitor the children’s responses as they identified the beginning and end of different measuring tools, and the numbers along the line. The children learnt to make sense of the code ‘cm’, and how in order to communicate length to someone else everyone would need to be using the same code. They recognised how their choice of symbol could affect another’s understanding, a key aspect of both the relating to others and the using language, text and symbols competencies.

The teacher used the multimodality of real-world resources presented via the IWB to elicit prior knowledge, connect it to new ideas and help children to make meaning of the information. A cicada slide show made by the class for a previous science unit provided a useful reminder about life cycles – children could see that the chrysalis brought into the class for news on the first day was a part of the life cycle just as a cicada shedding its skin was. A YouTube movie of a butterfly emerging from a chrysalis, made further real-world connections. In this way, the IWB supported the teacher’s pedagogical intention that the children think through the connections between slightly different examples, applying new knowledge back into this familiar context. Her aim was to make the learning of measurement and life cycles real for the children and in doing so she made it a motivational experience with image, colour, dance, rhyme, hands-on practice, comparison with what was already known with sufficient cognitive effort to challenge them at their respective levels.

Discussion

The teacher’s orchestration of the classroom learning environment

It is evident from these two learning examples, that the classroom had the characteristics of a supportive learning environment with the IWB being one of the tools that the teacher could draw upon to support the learning. All students had the opportunity to participate and contribute and their questions were viewed as an opportunity for reasoned discussion and treated with equality and respect. A sense of enthusiasm in the learning was engendered, with the teacher guiding the children’s investigations and dialogue towards the objectives she had set down for the unit. She was acutely aware of the value of the key competencies and skilfully articulated and rewarded small steps towards competency. She commented:

Before the interactive whiteboard is used effectively, the class atmosphere needs to be nurtured into one of sharing, patience, and support, if the children are all to enjoy their turns at the board, and the little challenges that take them to the edge of their comfort zone in front of groups or the whole class. All the key competencies come into play when using the IWB.

The teacher made use of the IWB to provide structure for the children’s activities by focusing their attention, guiding them to a new interpretation and eliciting prior knowledge to base new learning on. As individual children used the IWB, she gained insights into their next steps for learning. The IWB provided useful, relevant, real-world resources to illustrate and reinforce that new knowledge. As the teacher noted:
Children are rewarded for making connections to prior knowledge or to other curriculum areas, or for searching into their environment and verbalising independent connections. As we looked up at our cicada movie that the IWB had helped us to construct together, Mark said, ‘Just like the cicadas shedding their shells, we shed our teeth as we get older!’

The main idea of the unit of work on the Monarch butterfly was to have the children inquire into an aspect of the living world that was relevant to their experience. They were to observe, describe, identify, group and share in order to ‘develop an idea’ about the Monarch butterfly. The features of the IWB that provided support for their actions in these tasks included multimodality, dynamism, emphasis and acquisition (Kennewell & Beauchamp, 2007).

The multimodal nature of the IWB objects tapped into the visual literacy skills of these young children and enhanced engagement in the learning process when the digital microscope was used and when a YouTube movie was shown. Because of the respectful culture that had been encouraged in the classroom, children enjoyed and felt secure about going up to the IWB to add or annotate data, as the teacher discussed options and guided the children in their news of the day contributions. Children knew that their written work would be saved and used in other ways on other occasions as the IWB acted as a repository. The IWB also acted as a ‘digital hub’ (Betcher & Lee, 2009), bringing all types of digital experience together in the one place where the children could see and interact with the media.

The measuring activity furthered children’s experiences of numbers and number sequence as well as introducing the idea of using symbols to communicate meaning. The template and emphasis features of the IWB, and the user-friendly feature of the pen tool supported this. The size of the screen allowed all children to be involved at the same time, encouraging them to share experiences and ideas.

The IWB encouraged children to engage in dialogue around new concepts and then gave them opportunities to revisit and reflect on new learning. The IWB features allowed the children to make sense of a concept in a different way, such as viewing a dynamic YouTube movie of a butterfly emerging from a chrysalis and then comparing this with when their own butterfly emerged.

The development of key competencies and pupil autonomy

A distinctive feature of the classroom was the level of autonomy that children had in when and how to use the IWB. The teacher modelled behaviours expected and rewarded those who recognised that they needed to alter the way they worked, for example when they realised that they should have let someone else have a turn. In this way, the IWB provided support for the teacher to build children’s agency. Whitebread and Coltman (2008), in discussing pupil agency, declare that young children need to be active learners as they learn best by what they experience. These children were very active learners and felt a sense of belonging and a willingness to contribute their ideas and participate in whatever activity was going on. Even when just one child was using the IWB, the others appeared to be inextricably linked to the action, and to feel a part of that action – they were engaged and related to each other with respect. As the children used language, symbols, and texts on the IWB, they encountered several thinking challenges, from the technical challenge of how to make an object move to the intellectual challenge of understanding what part of the body a caterpillar’s feet were attached to. There was a great feeling of achievement or managing self whenever a task had been completed successfully, even when it was a simple full stop added to a sentence.
Conclusion

Learning in the twenty-first century should not focus only on the acquisition of discrete bodies of knowledge, but should be a process of cultivating the transferable capabilities and dispositions of effective real-life lifelong learning (Claxton, 2002). This is the idea behind the key competencies of The New Zealand Curriculum (Ministry of Education, 2007). This paper has briefly touched down in a junior classroom setting where the IWB features provided structure and potential for the children’s learning as well as the development of their key competencies, beginning their development as lifelong, autonomous learners. It was, however, the way that the teacher orchestrated the learning environment and the ways that she integrated the use of the IWB features into her student-centred pedagogy that was the key to the development of pupil competencies.

The implications for practice include the value of teachers taking care to orient their IWB-related pedagogy to student interests and needs, and the potential for them to orchestrate the use of new technologies in a manner that develops a classroom culture that includes a participatory pedagogy. Further research that focuses on the benefits of cross-curricular learning and developing children’s competencies for lifelong learning may help to convince policy makers of the merits of new technologies.

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Notes

1. Please note reference to these key competencies throughout the text in italics.
2. The New Zealand Curriculum is divided into eight core learning areas including science. Each learning area is specified at levels 1–8 encompassing primary and secondary learning from Year 1 to Year 13 of formal schooling.

Notes on contributors

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References


