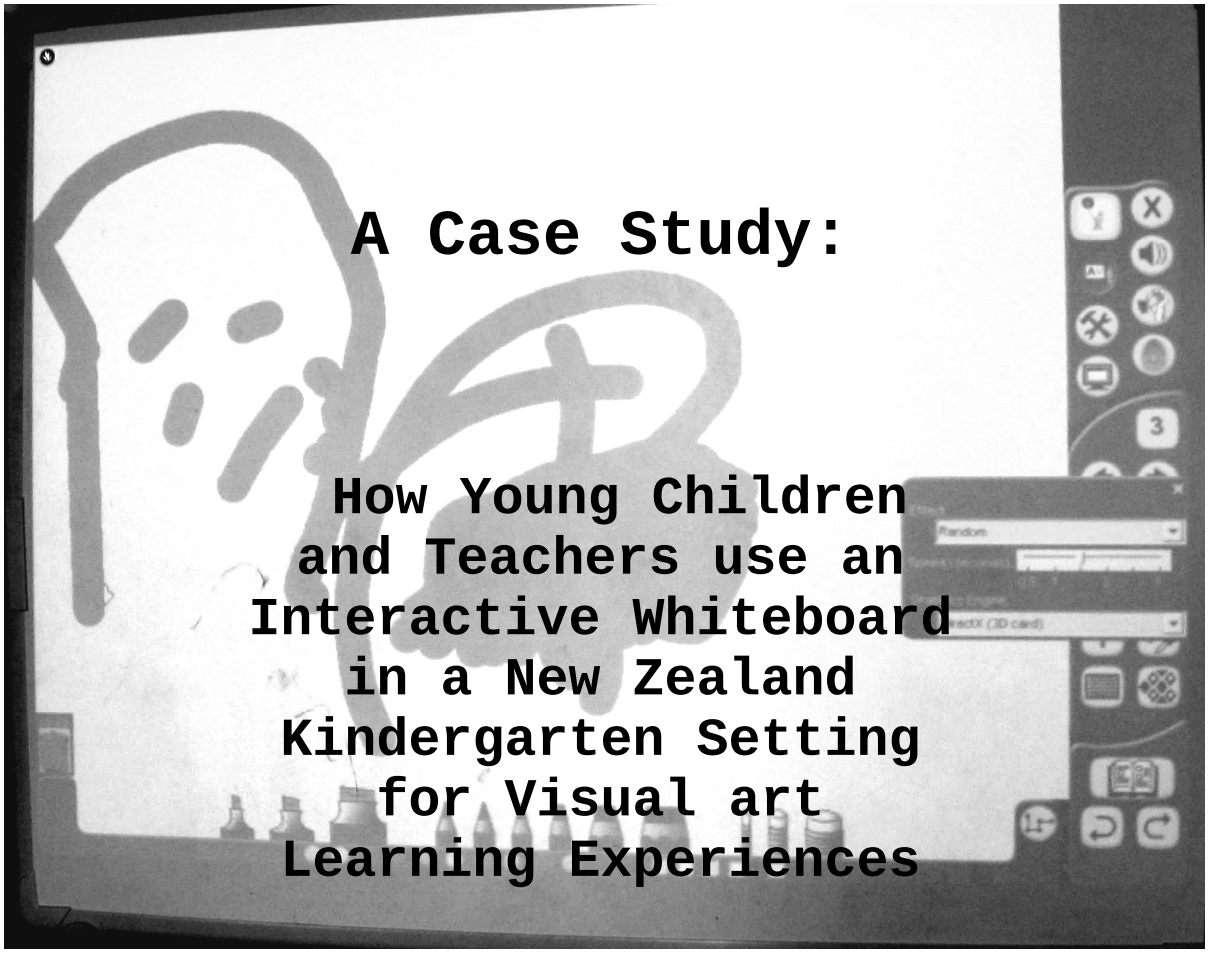

A Case Study:

How Young Children and Teachers use an Interactive Whiteboard in a New Zealand Kindergarten Setting for Visual art Learning Experiences

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Abstract

This case study examines how an interactive whiteboard (IWB) was used in a New Zealand kindergarten to support young children's visual art learning experiences. A qualitative approach was used to investigate the use of the IWB. Data were collected through participant observation, analysis of teachers' narrative assessments of children, and focus group interviews with teachers and parents. A socio-cultural perspective on visual art education for young children provided a framework for analysing and interpreting the data.

The findings of the research indicated that when an IWB is integrated into a kindergarten visual art programme it can be a useful tool for motivating and assisting children with visual art learning experiences. The affordances of the IWB allow for some new art experiences to occur that are different from that of traditional art mediums. It was observed, however, that creative art ideas developed with an IWB can be translated into traditional art mediums and vice versa. Problems and issues were also identified in the study, in particular the need for appropriate professional development for teachers to help them maximise the potential of the IWB for early childhood teaching. Areas for further research are discussed, and some recommendations are made for best practice with an IWB for supporting children's visual art learning experiences.

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CHAPTER 1

Introduction

1.1 Visual art and information communication technology (ICT)

Early childhood educators, researchers and policy-makers are increasingly recognising that visual art learning experiences are important for developing young children's thinking, learning and communicating (De Vries & McArdle, 2007). In the majority of early childhood settings in Aotearoa New Zealand teachers encourage children to freely use a range of mediums for traditional art-making activities, such as painting, drawing, clay, construction, collage, and printmaking (Ministry of Education, 1996). These provide a basis for young children's visual art learning experiences. Over the past decade there have been rapid advances in the development of information and communication technologies (ICT) and a marked increase in their use in early childhood settings in New Zealand. Consequently, the provision of "materials and technology" (Ministry of Education, 1996, p. 80) for visual art learning has now started to incorporate digital technologies. This study explores how an Interactive Whiteboard (IWB), a relatively new technology, is used in one state-funded kindergarten in relation to visual art learning experiences.

1.2 Rationale for the study

As a kindergarten teacher for many years I have had the opportunity to work with a diverse range of young children in the area of visual art, providing many traditional art experiences for them that were challenging, stimulating and enriching. However, increasingly, in my practice as a teacher and as an artist, I began to incorporate ICTs into my work and I quickly recognised the power and creative potential that new technologies, such as computers, digital cameras, scanners, photocopiers and the internet, could have for enhancing young children's visual art experiences, as well as my own. Currently, I am an early childhood teacher educator teaching visual art education. I continue to use ICTs to support my research-led teaching and to enhance my students' learning.

The research literature describing the impact of ICT on young children's visual art learning experiences in New Zealand early childhood settings is minimal. Nevertheless, relevant information can be drawn from other sources and related to the early childhood context. What appears to be a predominant theme in some of the literature is the changing nature of the visual art due to the development of ICT

and its increased use (Koster, 1997, Long, 2001; Loveless, 2007; Vecchi & Guidici, 2004). As Vecchi and Guidici (2004) put it, “New technologies have ... introduced new and different elements that are bringing changes to the environment of art and artists as well as that of children. We are dealing with a new landscape of possible mental images and technical and inventive action…” (p. 141). One ICT that is gaining currency in education settings is the IWB. In agreement with Kuzminski (2008) I believe that IWBs, like other ICTs, have the potential for creating new possibilities for young children’s visual art learning experiences. Undertaking research for this Masters thesis has enabled me to pursue my personal interest in exploring the impact of ICTs, particularly IWBs, on young children’s visual art learning experiences.

1.3 The aims, benefits and values of the research

My research examined the use of an IWB in a kindergarten setting that caters for the educational needs of young children aged two to five years old. The research, in the form of a qualitative case study, specifically looked at how an IWB can be used to extend and enrich young children’s visual art learning experiences, and the impact the technology had on teacher practice in this domain.

As already pointed out, there is limited research into the use of IWBs in early childhood settings nationally and internationally. To date, no research has been carried out on visual art learning experiences and the use of an IWB with this age group (see Chapter 2). Therefore, this study makes a contribution to the growing amount of New Zealand research on the impact of ICT and how young children learn using new technologies (see, for example, Bolstad, 2004; Duncan, Dysart, Ryba & Edwards, 2005), particularly in relation to their visual art learning experiences. The Ministry of Education’s ICT strategy *Foundations for Discovery* (Ministry of Education, 2005) has now been in place for three years, and early childhood teachers are increasingly using ICTs with young children to enhance their learning, thus making my research timely and relevant. The focus of the strategy, thus far, has largely been on using ICT for documentation and assessment of children’s learning, strengthening the involvement of families and whānau in children’s learning, and to support planning, information management and administration (Bolstad, 2004) as well as supporting inquiry-based learning. Improved confidence and competence in the use of ICT by teachers could promote an increased interest in ICTs such as IWBs being used for extending children’s learning in the visual art and other creative domains.

1.4 Background to the research

In 2006 I undertook a whole-centre Professional Development contract with two of the kindergarten teachers involved in this case study. The aim of this work was to extend the teachers' skills and knowledge about the ways in which ICT could be successfully implemented into their programme to enhance young children's learning. During the professional development contract I mentioned to the teachers that I was researching IWBs for one of my Masters course assignments. At the end of the professional development contract I signalled to the teachers that if they could access funding for an IWB I would be very interested in doing my Masters thesis on how young children at their kindergarten used this technology for their visual art learning. With assistance from their Kindergarten Association the teachers were able to access the necessary funding for an IWB (an ACTIVboard) through a charitable grant. The IWB was installed in the kindergarten at the beginning of 2007 and the teachers indicated that they were still willing to be part of a research project when I approached them.

The case study kindergarten is situated in a small suburban settlement in New Zealand which has a multi-cultural population. The kindergarten is located in a low socio-economic area, and attracts targeted funding to assist with its operations. In 2007 the kindergarten changed its hours of operation from a traditional kindergarten sessional model (of providing two sessions per day, which catered for 60 three and four-year-old children who attended either a morning or afternoon session), to a more flexible system where parents could choose sessional or all-day care for children aged two, three and four years old.

The operational changes resulted in an increase of staff. The teaching team at the time of the study consisted of five teachers – Kuini (the Head teacher), Kathy, Tanya, Martha and Surija. All the teachers had early childhood qualifications but their years of teaching experience varied. Kuini and Kathy had both been teaching in kindergartens for many years. At the time of the study, Kuini had been teaching at the case study kindergarten for 10 years (as Head Teacher since 2004), and Kathy for 7 years. Martha was also an experienced kindergarten teacher who had been seconded from another kindergarten to teach at the case study kindergarten as it settled into its new way of operating. Tanya and Surija had not long finished their teacher training and had only had a small amount of teaching experience in child care centres before being employed at the case study kindergarten.

Another impact on the operations of the kindergarten was an increase in the number of children attending and in the age range. Two, three and four-year-olds could now attend the kindergarten. At the time of this study the kindergarten had a client group of 66 children, aged from between two years old to nearly five-year-olds. The gender of the children attending the kindergarten was relatively equal for both boys and girls while the ethnic composition of the kindergarten was very mixed, with a high percentage of Māori and Pacific Islands children.

1.5 Chapter summary

There has been an increase in the use of ICTs by both teachers and children in early childhood settings in New Zealand. IWBs have the potential to add a new dimension to traditional visual art learning experiences for young children. This qualitative case study, undertaken in a state-funded kindergarten, examined how an IWB added a new element to young children's visual art learning experiences and to teacher practice in this domain.

1.6 Overview of the remaining chapters

Chapter 2: IWBs: A literature review

The first part of this chapter looks specifically at the technical functionality of an IWB and describes the type of IWB being used at the case study kindergarten. The second part of the chapter reviews research literature in relation to the use of IWBs by teachers and young children for visual art learning experiences in early childhood settings.

Chapter 3: Examining visual art education in New Zealand early childhood settings in relation to socio-cultural theory and practice

In this chapter key ideas embedded in socio-cultural theory are discussed in relation to visual art education. Recognising that visual art provides children with important tools for thinking and learning and that it is important for teachers, peers, parents and families to be actively involved in children's visual art learning experiences are fundamental to a successful socio-cultural visual art programme. A socio-cultural orientation is one which in itself is more culturally inclusive (Smith, 2004) and visual art programmes using this theoretical approach are likely to be culturally responsive, validating and affirming children's identities and interests.

Chapter 4: The research methodology

Chapter 4 outlines the methodology used for this research. It describes the way in which qualitative data were collected through participant observations, analysis of teachers' narrative assessments, and focus group interviews with parents and teachers. Ethical considerations are discussed, as well as the constraints and issues relating to the project.

Chapter 5: Visual art pedagogy and the IWB

This chapter examines the case study teachers' visual art pedagogy and practice and how this influenced the way the IWB was used to support the children's visual art learning experiences. Using data from the participant observations, the Learning Stories – a form of narrative assessment that examines and assess children's learning (Carr, 2001) – and the focus group interviews, several key themes emerged and these are discussed in depth. These include: the role of the teacher, a process rather than product approach with the IWB, the significance of time for children's visual art learning experiences with the IWB, the ability to transfer skills from the IWB to other mediums and vice versa. The provision of large, physical drawing opportunities, and how the IWB can be used to support children's interests are also discussed. Included in this chapter is a reflection on the teachers' individual level of skill with the IWB and how this impacted on their confidence and competence when using the technology.

Chapter 6: Children and teachers use of the IWB for visual art learning experiences

The key themes from the participant observations, the focus group meeting with teachers and some Learning Stories are presented in this chapter. These include: the affordances of the ACTIVprimary software and the types of visual art learning experiences this fosters, collaborative and peer support in visual art learning experiences using the IWB, and tuakana/teina learning relationships with the IWB. Drawing and story telling with the IWB, and the impact of the location of the IWB on the children's and teachers' use of the technology for visual art learning experiences are also discussed. Themes are analysed in relation to relevant literature.

Chapter 7: Children's visual art learning experiences with the IWB

The findings from teachers' narrative assessments (Learning Stories) of young children's use of the IWB for visual art learning are presented and key themes that emerged from the data are identified, supported by information from participant observations and the focus group meeting with teachers. These are then discussed and analysed in relation to relevant literature.

Chapter 8: Parents' views on visual art and the IWB, children's use of computers at home and the role of siblings

This chapter examines the findings from the focus group interviews undertaken with both teachers and parents. Key themes are identified, and discussed and analysed in relation to relevant literature.

Chapter 9: Discussion of the problems, potential and possibilities of using an IWB for visual art learning experiences

In this chapter I consider problems associated with the IWB for children's visual art learning. The potential uses and possibilities for children's visual art experiences with an IWB are also identified and discussed.

Chapter 10: Conclusions and recommendations

Key findings from my study are briefly summarised in this chapter, and recommendations are made, where relevant, of ways in which the IWB could more effectively enhance young children's learning. The limitations of this thesis, possibilities for future research and professional development for teachers are also discussed.

CHAPTER 2

Literature Review

2.1 Introduction

The previous chapter highlighted the increasing role of ICT, particularly IWBs, in New Zealand early childhood settings for teaching and learning and how this may have an impact on visual art learning experiences for young children. This chapter examines research involving the use of IWBs in relation to young children's visual art learning experiences. The first section looks specifically at the technical functionality of an IWB and describes the type of IWB being used at the case study kindergarten. The second part reviews research in relation to the use of IWBs by teachers and young children for visual art learning experiences in early childhood settings.

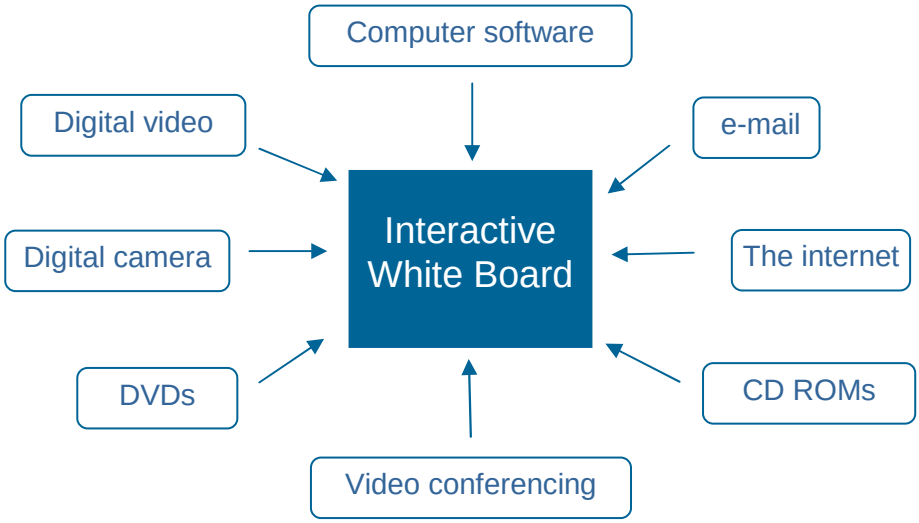
2.2 Description of the functionality of an IWB

The British Educational Communications and Technology Agency (BECTA)[1] (2005) defines an IWB as:

> …a large, touch-sensitive board which is connected to a digital projector and a computer. The projector displays the image from the computer screen on the board. The computer can then be controlled by touching the board, either directly or with a special pen. (p.1)

The Northern Territory Government (2005) describes IWBs as large-scale digital convergence tools which can enable students and teachers to access a range of digital communication technologies such as the internet, e-mail and video conferencing, as well as a variety of different computer software programmes.

[1] BECTA is the British government's lead agency for ICT in education. It plays a significant role in leading the co-ordination, development and delivery of the government's strategy to use technology to help improve education, skills and children's services.



Digital convergence dimensions

An IWB requires four key components for functionality – the board itself, a data projector, a computer, and computer software (White, 2007).

IWBs revolutionise traditional computer practice by enabling users to manipulate objects on the screen directly with their hands, fingers, or a special pen, rather than using a mouse (although a mouse can still be used to operate the IWB). This ability could have profound implications for early childhood contexts where the provision of kinesthetic opportunities (Haldane & Somekah, 2005; Lee & Boyle, 2003) is seen as fundamental to enhancing young children's learning, and might enable them to develop "strategies for actively exploring and making sense of the world by using their bodies, including active exploration of all the senses, and the use of tools, materials and equipment to extend skills" (Ministry of Education, 1996, p. 86).

The type of IWB being used at the case-study kindergarten

The case study kindergarten has an ACTIVboard, manufactured by Promethean. This brand of IWB is increasingly being employed in educational settings both internationally and in New Zealand. ACTIVboards were one of several different types of IWBs used in a very large scale educational initiative by the British government, the Primary Schools Whiteboard Expansion Project, in 2003-2004 (Somekh et al., 2007). They were also utilised in a large scale New Zealand research project, Project ACTIVate (Duncan et al., 2005), which I discuss later in this chapter.

A standard model ACTIVboard (see image 1) has the following technical specifications:[2]

- Digitising technology: Passive electromagnetic.
- Internal resolution: 2730 points (lines) per inch. Tracking rate: 200 inch per second.
- Output rate: 120 co-ordinate pairs per second.
- Connection options: Serial (RS232), USB 1.1/2 or Bluetooth (not yet available in NZ) Certification: CE, FCC, UL listed.
- Operating temperature: -10°C to +50°C. Storage temperature: -25°C to +70°C.

The overall sizes of an ACTIVboard range between 50” (127 cm) and 95" (241 cm) diagonally. The standard ACTIVboard screen (low-glare) is usually fixed to the wall and is discreetly wired to a computer and a ceiling-mounted data projector. It has two wall mounted speakers which are placed either side of the screen. A battery-operated, wireless mouse pen facilitates the interactive functionality of the IWB.

Different types of software can be used interactively on the ACTIVboard but software packages come with the standard ACTIVboard include ACTIVprimary and ActivStudio. The ACTIVprimary software provides a range of digital tools designed to support children’s learning and enhance teaching practice, such as pens, eraser tools, and highlighters.

Image 1: The ACTIVboard used at the case study kindergarten

[2] Information downloaded August 14, 2008, from http://www.prometheanworld.com/uk/upload/pdf/Activboard_20080121054314.pdf

Included with the ACTIVprimary software is a range of lesson resources that have been developed (based on the United Kingdom's National Curriculum) to assist teachers and these provide interactive possibilities for children in specific fields such as literacy, mathematics and science. It is important to note that these particular resources are aimed at children attending primary school rather than early childhood services. Some specific New Zealand content, however, is available in the ACTIVprimary resource library in a folder named the New Zealand collection, which contains iconic images. More resources are available from the ActivBoard.knowldege.net website (pass-worded) which is a New Zealand dedicated website. The ACTIVprimary software allows teachers to develop teaching flipcharts that can incorporate text, images, video clips, sound and web page content.

2.3 The use of IWBs and young children's visual art education in early childhood settings

Research into the use of IWBs in early childhood settings

My literature search into the use of IWBs in early childhood settings internationally and in New Zealand revealed that there has been very little research carried out in this area. Siraj-Blatchford and Siraj-Blatchford (2003) also found that systematic research studies in early years settings are virtually non-existent but noted that "some particularly positive practices have been observed" (p.45). They identified that the IWB enabled the effective use of interactive software by both individual and small groups of children. Siraj-Blatchford and Siraj-Blatchford believe that this technology has great potential for adults working with groups of children "on focused tasks or in exploring adventure games and simulations they could not otherwise operate for developmental reasons – such as interface sophistication or reading capability" (p. 45). Observations of children engaging in visual art experiences were not noted. Nonetheless, they express some caution with the use of IWB technology if specific training with the resource is not undertaken by early years teachers, and they fear that poor pedagogical practice could "reduce rather than improve interactivity" with the technology (p. 47).

There has, however, been a very small amount of research interest in the use of IWBs in early childhood settings by two New Zealand early childhood e-Fellows, Jo Colbert and Carol Marks[3] who were able to undertake small trials of the technology

[3] An e-fellow in 2005, Jo Colbert's research investigated whether ICT could enhance the complexity, connections and continuity of young children's story telling. In 2006, Carol Marks' research investigated whether ICT can enhance imaginary play and story telling and how this strengthened children's voices.

in their kindergartens (teaching children aged 3 and 4 years old). Their observations and responses to children using an IWB in these settings have largely been anecdotal and they did not publish research reports.

In 2005 Colbert carried out a small explorative investigation of the use of a Smart Board (an IWB that allows children to use their fingers to manipulate objects rather than a pen) in an Auckland kindergarten setting. Colbert observed kindergarten children using the IWB with the Kidpix drawing package. She maintained the potential was there for good art exploration, especially once the children had worked out how to deal with the shadow created by the front-mounted projector. Colbert also found after some experimentation that positioning the IWB down at floor level was important to assist children's ease of access to the board for their work. This concurs with the Siraj-Blatchfords' (2003) observations that IWBs are often installed too high for young children and need to be adjusted so they can access them easily, either by "lowering the board's customisation of the projector cradles, or by providing staging for children to stand on" (p. 47). Colbert commented:

> The smart board as an art activity enables the children to use full body movements; they are able to use their whole arm when they draw on the screen rather than just fine motor control, although this is also required when children extend their artwork to include more detail. The smart board enabled children to use Kidpix in a way that I think it is designed for, as a drawing/art programme, without the frustrations associated with using it on the laptop. It also made it a far more interactive experience for the children, as they were able to fully involve themselves in their artwork, by using their finger as a drawing tool. (J. Colbert, personal communication, 3 October, 2005)

During the trial Colbert had some major concerns about protecting the equipment[4] and believes that the huge expense of the hardware could pose barriers to the children's free access because teacher supervision was crucial. After the week's trial she concluded:

> I can see the potential for it to be used in other ways within the kindergarten environment, incorporating the child's love of story telling and art, and sharing their digital stories … and as a method of sharing other work they have done, using the digital camera for example. (J. Colbert, personal communication, 3 October, 2005)

There appears to be general agreement in the literature that teaching behaviours and practices in regards to the use of ICT need to be guided by sound educational pedagogy (Bolstad, 2004; Ministry of Education, 2005). Somekh et al. (2007) believe that the introduction of any new technology into a classroom requires staff to be

[4] In this instance the projector was not a permanent ICT tool so was not ceiling mounted which is recommended (White, 2007) for protecting the projector, and eliminates the need for concern over its protection.

technically trained and that they will need to change their existing pedagogy. This also has application to the early childhood context. Bolstad (2004) argues that much of the literature relating to ICT and young children suggests "learning is significantly affected by teachers' pedagogical awareness, education, and ability to meet each child's interests and support, stimulate, and challenge their learning" (p.38).

The use of IWBs in school settings

Whilst research on how IWBs can enhance young children's learning in early childhood settings is scarce, there has been considerable research in other education sectors. For example, Gilroy (2005) examined the effects of using an IWB in a Year 6 (children aged 10 years) New Zealand classroom. An Australian study by Lee and Boyle (2003) investigated the use of IWBs throughout the classes at Richardson Primary School (children aged 5 – 10 years). These studies found that there are positive affordances offered by the IWB technology. Key factors were identified by Gilroy (2005) and Lee and Boyle (2002) that demonstrated that IWBs supported children's learning. These included:

- IWBs provided tactile 'hands-on' experiences suitable for kinesthetic learners
- IWBs enhanced group learning activities by quickly capturing children's joint attention
- IWBs immediately responded to children's interests by accessing information relating to these from a variety of sources
- IWBs enabled teachers to model exploration and research skills
- Children had easy physical access to the large screen
- Children often engaged in peer tutoring on how to use the board and the applications
- Shy and/or reluctant learners were attracted to the technology
- IWBs were effective for storing and then reviewing students' work.

Another New Zealand study, Project ACTIVate, included several research reports which examined and analysed the effects of teaching and learning with IWBs (ACTIVboards) in the compulsory education context (Bowman & Tait, 2005; Boyle, 2005; Ellis & Wainui, 2005; Engles, Lane, Yelas, Cairns & Scott, 2005; Garden, 2005; Kennedy & Anderson, 2005; McDonald, Maru, Maru & Shaw, 2005; McDowell & Murray, 2005; Murray & Morunga, 2005; Redwood & Beyer, 2005; Ridley, 2005; Woods, Stevens, Mes & Reid, 2005). Project ACTIVate was a collaborative project

involving two school clusters located in Auckland and Southland. There were fourteen different schools involved and these were a mix of state and integrated primary and secondary schools. The majority of the schools were mainstream schools but there were also two Kaupapa Māori schools involved. Project ACTIVate was a Digital Opportunities project with joint initiatives between the New Zealand Ministry of Education, ICT related businesses and enterprises and state and integrated schools. There were no early childhood services included.

The action research projects in Project ACTIVate were informed and planned from recent information from the Ministry of Education regarding quality teaching in the compulsory school setting (Alton-Lee, 2003). The studies covered projects involving knowledge domains – such as science, written and oral literacy – and evaluated student learning behaviours with the IWB – for example, on-task learning, motivation and inquiry. The use of the IWBs in Project ACTIVate involved a range of teaching and learning approaches to using the IWB with students seeking to answer specific research questions relating to the effectiveness of the IWB for students' learning. These included: using an IWB in a science laboratory (Garden, 2005), Problem Based Learning with an IWB (Engles et al., 2005), enhancing communication, team-work and collaborative skills with an IWB (Redwood & Beyer, 2005), using an IWB to enhance literacy and writing skills (McDowell & Murray, 2005), and the IWB as a vehicle to enhance student motivation (Ridley, 2005).

Key successes were identified by researchers in the study which demonstrated that IWBs enhanced learning in their classroom settings. These established that IWBs were useful for:

- Motivating students and making learning enjoyable (Ridley, 2005).
- Encouraging cooperative learning and students taking an active role in teaching others (Woods et al., 2005).
- Encouraging and motivating shy and less communicative children (McDonald et al., 2005).
- Assisting children to understand how concepts link together (Garden, 2005).
- Giving children access to digital resources to use with more traditional sources of information for problem solving (Engles et al., 2005).

Some of the challenges identified by the teachers involved in Project ACTIvate were:

- Creating opportunities to explore the full potential of the IWB in domain specific areas (Garden, 2005).
- The time it took to get children to become familiar with the functions of the IWB and how to make best use of it in relation to what was being taught (Ellis & Wainui, 2005; Redwood & Beyer, 2005).
- Logistical challenges of timetabling class use and group access to the IWBs and providing enough time for pupils' reflection on how they used the IWB (Engles et al., 2005).
- Children's technical knowledge sometimes not being up to the task (McDowell & Murray, 2005).
- Technical difficulties (Kennedy & Anderson, 2005).

What appeared to be one of the significant factors for the Kura Kaupapa (Māori immersion) schools involved in Project ACTIVate was the way the IWB could foster collaborative tuakana/teina relationships that were seen to provide a connection between Māoritanga and technology (Rewiti-Martin & Ormsby, 2003, cited in Ellis & Wainui, 2005). This collaborative aspect of the use of the technology has resonance with the New Zealand early childhood curriculum, which states "children learn through collaboration with adults and peers, through guided participation and observation of others, as well as through individual exploration and reflection" (Ministry of Education, 1996, p.9).

Despite the significant amount of information generated from Project ACTIVate, none of the research projects dealt with the use of the IWB specifically in relation to enhancing visual art learning experiences. However, the positive learning and teaching behaviours described in the projects share similarities with those identified by Gilroy (2005) and Lee and Boyle (2003). Again, it is also important to note that whilst this research has useful insights into the use of this technology in a teacher-directed, lesson plan-oriented classroom setting in the compulsory school sector, early childhood pedagogy in New Zealand, which is predominantly child-centred, holistic, and supports children's learning through free play based on their interests, is considerably different to that of the other sectors (Ministry of Education, 1996).

Research into the use of IWBs for visual art teaching in a school setting

Using an IWB for visual art learning is explored in a Masters research study undertaken by Kuzminsky (2008). Kuzminsky examined her own use of IWB technology (an ACTIVboard) for teaching children aged 5 and 6 years old in an American kindergarten classroom. A teacher with a passionate interest in visual art, Kuzminsky researched how she developed her planning and teaching practice to incorporate an IWB in this subject area. She was particularly interested in the use of IWBs for the study of visual art history and criticism, and for developing visual thinking strategies in children, for example, using "art to teach thinking, communication skills and visual literacy" (Vue, 2008, cited in Kuzminsky, 2008, p.16).

The children's hands-on art activities (planned for them as a result of a lesson on the IWB) tended to be constructed with traditional art materials (rather than on the IWB itself), using ideas and information learnt from the visual art teaching sessions with the IWB. Nonetheless, Kuzminsky argues that computer generated art has as much legitimacy as traditional art forms and that "the computer is simply the tool and medium that the artist chooses to employ" and that "every action the computer takes is directed by the artist" (p.8).

Kuzminsky concluded that an IWB is an appropriate technology for integration into the visual art classroom. She identified several affordances of the IWB that can assist with the teaching of visual art. These included:

- Teacher lesson planning which is done on a laptop can easily be transferred to the IWB.
- IWBs interface easily with other tools useful in visual art education such as digital cameras, scanners, video cameras, and VCRs.
- During instruction students can effectively view software and information from the internet useful for visual art learning experiences because of the large size of the board.
- The interactivity of the IWB captures students' attention.
- The IWB is useful if students' individual access to computers is limited in the classroom.
- IWBs can support "constructivist learning theory, in which teachers facilitate student investigation, and students direct their own discovery" (p. 16).

It must be recognised that kindergarten is the first stage of formal schooling in the United States which is different from the New Zealand educational context where kindergarten programmes offer play-based education for children aged from 2 – 5 years. Although the results of the study may have some application to the New Zealand school setting, there are significant differences between a formal lesson plan approach and a holistic play-based approach in relation to both curriculum content and pedagogical practices. Nonetheless, some of Kuzminsky's findings relating to the use of an IWB for facilitating visual art learning opportunities for children could have application to the early childhood context, particularly if teachers and children are using a variety of digital tools, such as digital cameras, video, DVDs, and the internet for visual art inquiry-based learning activities.

ICT and creativity

I have been unable to locate any research specifically relating to IWBs and visual art learning experiences in early childhood contexts. Loveless (2003), however, writes about the creative potential of ICT in primary school classrooms in which visual art is an integral part of the curriculum. She suggests "there can be an interaction between frameworks for creativity and understandings of ICT capability and the 'creative subjects' in the primary curriculum offer authentic and relevant contexts" (p.6). Loveless identifies the creative subjects as: visual art, drama, music, and design and technology, and written literacies (poetry, creative writing, and story telling). She believes "creative activities with new technologies can include developing ideas, making connections, creating and making, collaboration, communication and evaluation" (p.6).

Whilst Loveless (2003) does not identify specific technologies such as IWBs, her ideas do have application when considering the implications of the use of IWBs for enriching children's visual art learning experiences. She also makes the cautionary comment that teachers need to be aware of the limitations and constraints in the use of digital technologies, expressing concern about "the lack of kinesthetic and physical involvement with the media and the ease of production of effects which could lead to "uniformity and lack of distinctive and 'individual' signatures in the work produced" (p.12).

More recently, Loveless (2007) examined the links between creativity, technology and learning in a report for FutureLab.[5] The affordances of digital technologies were considered and a framework of 'clusters' of purposeful activity that can assist practitioners about thinking about how digital technology can foster creativity was developed. This included the following:

- knowledge building – adapting and developing ideas, modeling, representing understanding in multimodal and dynamic ways.
- distributed cognition – accessing resources, finding things out, writing, composing and presenting with mediating artifacts and tools.
- community and communication – exchanging and sharing communication, extending the context of activity, extending the participating community at local and global levels.
- engagement – exploring and playing, acknowledging risk and uncertainty, working with different dimensions of interactivity, responding to immediacy. (p. 7)

These clusters are useful for thinking about the affordances of IWB technology and how they can be harnessed for developing young children's creativity in visual art as well as other domains. Loveless (2007) suggests that creative processes need to be supported with "opportunities for play, exploration, reflection and focused engagement with ideas" (p.9) and that digital technologies can play a role in these activities.

Prentice's (2000) writing on creativity in early childhood contexts also supports the idea that children need opportunities to explore and play with ideas and materials, and in this case, new technologies. He remarks:

> Children need to be guided and supported to maximize opportunities to explore creative potential of unfamiliar materials and ideas. They require encouragement, to increase confidence to be inventive, and sufficient time to 'play with ideas' and to 'toy with materials'. (p.154)

Loveless (2007), nevertheless, offers a cautionary note to the notion of children's free play with technologies that has particular relevance for those working with ICTs, such as IWBs, in early childhood settings. She states:

> Free play with digital technologies, however, does not guarantee effective or creative engagement or development, and there is still need to support and guide children's interactions in informed ways. (p.9)

I would argue that young children need sufficient scaffolding and support by teachers to ensure that they have the necessary competencies to be able to use

[5] Futurelab is a not-for-profit British organisation that supports the use of digital and other technologies and develops "innovative resources and practices that support new approaches to learning for the 21st century." (Futurelab, 2007, website http://www.futurelab.org.uk/about_us).

ICTs effectively. They also need many opportunities for play and experimentation with ICT to use new skills and knowledge so that they can use ICT creatively. Children need time to do this which is in agreement with Oldridge (2007) who asserts that young children need unrestricted time to explore the potential of computers and other ICTs in early childhood settings.

Commenting on ICT and visual art education for older high-school aged students, Long (2001) highlights the need for visual art education to accommodate the technologies that children are increasingly exposed to in order to enhance their creativity and ideas in this domain. He argues that the art curriculum needs to make connections between the images of popular culture and fine art, giving children a greater range of visual experiences to inspire them and inform their work. He believes this approach can link more effectively to children's interests when he suggests that:

> Visual art education will be able to make powerful links to cultural forms that surround children and enable them to bring in those references. (p. 204)

Vecchi and Guidici (2004) add impetus to these ideas when they state:

> New technologies have ... introduced new and different elements that are bringing changes to the environment of art and artists as well as that of children. We are dealing with a new landscape of possible mental images and technical and inventive action… (p. 141)

It is highly likely that new technologies such as IWBs will bring changes and possibilities to young children's visual art explorations and, in so doing, provide new opportunities to enhance their creativity in relation to visual art learning experiences.

Teachers' professional development

How early childhood teachers support, scaffold and encourage young children's explorations in visual art using digital technologies such as IWBs will, to a large degree, depend on their own confidence and competence with the technologies (Jones & Scrimshaw, 1988; Long, 2001; Prensky, 2001). Prensky (2001) argues that teachers need to "learn to communicate in the language and style of the students" (p.3) whom he identifies as "digital natives" and who are often much more at ease with ICT than their teachers. Consequently, adequate training and on-going professional development for teachers in early childhood using IWBs is a significant factor in young children's successful learning with the media (Bolstad, 2004; Haldane & Somekah, 2005; Siraj-Blatchford & Siraj-Blatchford, 2003).

Several of the teacher-researchers involved in Project ACTIVate shared the view that good training and on-going professional development for staff was a crucial aspect of the successful use of the IWBs in the classroom context (Kennedy & Anderson, 2005; McDonald et al., 2005). This view concurs with a BECTA (2007) report which states: "Teachers require continuing professional development in higher level use of interactive whiteboards to bring about the kind of pedagogical changes that are possible with interactive whiteboards" (p.12).

2.4 Chapter summary

In summary, there is a considerable amount of research and related literature that describes what an IWB is and how this multi-convergence tool (Northern Territory Government, 2005) can be used successfully in primary and secondary school settings. The large New Zealand research project, Project ACTIVate, examined the use of IWBs in a range of classroom situations. The findings indicated that the technology can be a useful tool for enhancing learning and teaching in a formal educational context. There is, however, a very limited amount of research in early childhood contexts.

Research into the use of an IWB for enhancing children's visual art learning experiences is extremely limited. Nevertheless, Kuzminsky (2008) demonstrated that the technology can be effective for formal lessons in art critique and art history lessons, and in developing children's visual literacy and thinking skills. To date no research has been carried out on the role of an IWB for supporting young children's visual art learning experiences in a child-centred, free-play based early childhood setting for children 0 – 5 years old.

ICT, including IWBs, can be successful and useful tools for enhancing children's learning. Creative thinking and learning that can be enhanced by using ICTs, such as IWBs, include: developing new ideas, making links and connections, developing and making new things, collaboration, and communication. In order to enhance young children's creativity with ICTs, teachers need to provide children with guidance and support, as well as opportunities for play and exploration that are not time-bound (Loveless, 2007). New technologies are having a powerful impact on children, art and artists (Kuzminsky, 2008; Vecchi & Guidici, 2004) and IWBs are likely to create new visual art learning experiences for young children.

In the following chapter key ideas embedded in socio-cultural theory are discussed in relation to visual art education for young children in early childhood contexts.

CHAPTER 3

Examining Visual Art Education in New Zealand Early Childhood Settings from a Socio-Cultural Perspective

3.1 Introduction

In Chapter 2 I reviewed the literature on the use of IWBs in educational settings. In this chapter I examine visual art education in New Zealand for young children in relation to socio-cultural theory and practice. Using current research literature, this review provides the theoretical framework for analysing and interpreting my research data.

3.2 A broad overview of the place of visual art in the early childhood curriculum

Te Whāriki (Ministry of Education, 1996), the New Zealand early childhood curriculum document, guides early childhood teaching practice in regard to visual art provision through the learning strands. For example, in the Communication Strand it suggests that children need to develop "familiarity with the properties and character of the materials and technology used in the creative and expressive arts" (p. 80) and experience "an environment where they discover and develop different ways to be creative and expressive" (p.74). *Te Whāriki* recognises that children need to be able to use confidently both verbal and non-verbal strategies for expressing their understandings and experiences of the world, and that visual art education plays an important role in their learning process.

Visual art is a domain of knowledge and learning which is generally integrated into all early childhood programmes in New Zealand. However, unlike prescriptive curricula that highlight subject content knowledge that needs to be 'taught' (Haggerty, 2003), visual art exploration by young children in early childhood is usually done in the context of holistic, play-based programmes. In this context teachers encourage children to freely use a range of traditional core art media. These generally include: painting, drawing, clay, construction, collage, and printmaking.

3.3 Paradigmatic shifts in curriculum and pedagogy: The impact on visual art education

Early childhood education in New Zealand has, over the past twenty years, experienced a significant paradigmatic shift away "from a predominantly developmental-constructivist to sociocultural discourse" (Edwards, 2007, p.83). The emergence of socio-cultural theory has led many early childhood educators and academics to challenge "the hegemony of child development theory to acknowledge diverse rather than universalistic and naturalist viewpoints" (Haggerty, 2003, p. 36). *Te Whāriki* (Ministry of Education, 1996) has been instrumental in positioning socio-cultural theory as the dominant discourse in New Zealand early childhood education. *Kei Tua o te Pae Assessment for Learning: Early Childhood Exemplars,* guidelines for assessment in early childhood settings published by the Ministry of Education in 2005, has also reinforced the socio-cultural emphasis on curriculum and assessment.

Tharp and Gallimore (1988, pp. 6-7) believe that socio-cultural theory has "profound implications for learning, schooling and education." They see one of the key features of this emergent view of human development as the belief that higher order functions, such as thinking and learning, develop out of social interaction. *Te Whāriki* takes this idea further and emphasises that in developing curriculum early childhood educators need to be cognisant of "the critical role of socially and culturally mediated learning and of reciprocal and responsive relationships with people, places and things" (Ministry of Education, 1996, p. 9).

Despite the shift towards a stronger socio-cultural orientation in the early childhood curriculum several early childhood commentators in New Zealand have observed that many early childhood teachers retain a developmentalist approach in relation to visual art education (Clark & de Lautour, 2007; Gunn, 2000; Lewis, 1998; Richards, 2008; Terreni, 2005; Visser, 2004). As Richards (2008, p.22) puts it, "although sociocultural theory challenges educators to embrace the social nature of learning, common practice in early childhood art has varied little from its traditional stance on natural art development, adult non-intervention, and the sacrosanct nature of creativity and artistic expression—outdated relics on hallowed ground." Gunn (2000) and Richards (2008) both argue strongly that visual art education in early childhood contexts needs to be grounded in socio-cultural theory so that teacher practices in this domain become congruent with those implicit in *Te Whāriki.* Visser (2007) however, notes that there are "inherent tensions between the developmental and socio-cultural perspectives within the early childhood curriculum" which she believes

can complicate teachers' "endeavors to implement a more socio-cultural perspective" (p. 5) in relation to visual art education.

A social-constructivist approach in visual art is readily identifiable in the educational practices of Reggio Emilia pre-schools in Italy (Edwards, 2003). The Reggio Emilia approach (as it has come to be known) has helped to position visual art learning experiences as central for children's learning and cognitive development. Many educators throughout the world turn to Reggio Emilia for inspiration, and early childhood educators in New Zealand are no exception. The Reggio Emilia pre-schools are known for the emphasis placed on the visual art and the recognition that visual art is an important 'language' (Gandini, 2001; Malaguzzi, 1998) through which children mediate their experience of the world. According to Edwards (2003, p.261) the Reggio Emilia socio-constructivist approach recognises "the reciprocal relationships that exist between children and their immediate/extended communities in order to initiate and support learning opportunities and promote development and children's understanding of particular concepts".

The Reggio Emilia approach successfully aligns visual art education practices with socio-cultural theory and whilst this approach is gaining currency in New Zealand and some centres are successfully implementing Reggio Emilia ideas in relation to visual art pedagogy (Mayo, Ryder & Wright, 2006), many are not. New Zealand has a dedicated core of early childhood educators who have formed an incorporated society "dedicated to exploring the philosophy of the Reggio Emilia infant and toddler centers and preschools within the cultural context of Aotearoa/New Zealand" (from Reggio Emilia Provocations website http://www.reggioemilia.org.nz). Interest in Reggio Emilia socio-constructivist pedagogy and practice continues to grow but the majority of New Zealand early childhood centres do not subscribe to this particular philosophy or mode of teaching in the visual art.

3.4 Aligning early childhood visual art education with socio-cultural theory and practice

Socio-cultural theory has emerged primarily from the theories of teaching and learning developed by Vygotsky (1978). Edwards (2003, p.257) suggests that despite the "increased theoretical currency" of socio-cultural theory in early childhood there have been various interpretations which have resulted in a number of different readings of the theory and this has resulted in some differences in teacher practice. She classifies these as the transformative, the assimilated

positivist and the socio-constructivist 'paths' of socio-cultural theory. However, despite the variations, key ideas have emerged that are important for understanding learning and which have relevance to visual art education for young children. They can be identified as the following:

- Children acquire the cultural and psychological 'tools' of their community, such as language or art-making that mediate their thinking processes and assist with the learning (Brooks, 2003; Cole & Wertch, 2002).
- Learning leads development (Edwards, 2003).
- Children need challenging learning experiences that move them to new levels of development (Kindler, 1996).
- Learning occurs as children interact socially with others for example with their peers and teachers, families, and members of their community (Fleer, 2002).
- The social and cultural context/s in which children live have a significant impact on their learning (Rogoff, 1984, cited in Edwards 2003).

To demonstrate the significance of a socio-cultural approach to visual art education it is important to analyse critically these key ideas or conceptual strategies to highlight effective strategies and approaches that can increase early childhood educators' understanding of how effective learning takes place in this domain, enhancing young children's visual art learning experiences.

Children acquiring cultural and psychological 'tools' for mediating thinking

Vygotsky (1981) saw language as the key cultural and psychological tool that individuals use for communicating with each other. However, he also recognised that language functions as an important mediation tool that assists with cognitive processing and meaning-making. Whilst language was his primary focus (Vygotsky, 1981, cited in Cole & Wertch, 2002), he also identified other mediation tools such as: "various systems for counting; mnemonic techniques; algebraic symbol systems; works of art; writing; schemes, diagrams, maps, and mechanical drawings…" (Vygotsky, 1982, p. 137). Visual art education for young children, which provides experiences that encourage children to explore art-making as well as opportunities to look at and discuss visual art (Terreni, 2005), gives children opportunities to think about and recreate their experiences of the world they know. Through visual art learning experiences children undergo "the appropriation of knowledge through representational activity" (John-Steiner & Mahn, 1996, p.194) which assists their overall development and learning.

Malaguzzi (1998), one of the founding pedagogues of the Reggio Emilia programmes, took this idea further by developing the concept of the hundred languages of children. His concept challenges the privileged position of spoken language as the central mediation tool for meaning-making and recognises that children have, and need, a larger repertoire of tools in which to explore, understand and learn about their world. The Reggio Emilia approach to the education of young children recognises the importance of visual art education which incorporates important "social, cultural and cognitive activities" (Visser, 2005, p. 38) through the provision of a range of media and visual art learning experiences.

The still popular developmentalist view that the visual art process for young children is one of "naturally unfolding artistic development" (Richards, 2007), and therefore useful mainly as an outlet for children's creative and emotional self-expression, is challenged by the ideas expressed by these theorists and educators. A significant rethinking about the role of visual art by recognising its importance in assisting children's thinking and learning is the first step that is required by early childhood educators to align their teaching practices to socio-cultural pedagogy.

Learning leads development in visual art

The idea that learning leads development (Edwards, 2003), as opposed to the developmentalist position, which suggests that development leads learning, challenges the view that "artistic growth is the result of natural, genetically preprogrammed unfolding of dispositions controlled by maturation" (Kindler, 1996, p. 10). When learning is viewed as leading development that occurs through the social interactions children have with adults and their peers, social engagement with children in their visual art learning experiences becomes very important.

Adult input into children's visual art learning experiences not only creates important opportunities for children to "talk about, critique and reflect upon their representation of their worlds" in their art making (Gunn, 2000, p. 160) but also creates opportunities for teachers to actively enhance young children's learning through their art in areas such as "abstract thinking, metacognition, directed memory and logical reasoning" (Wieczorek-Ghisso, 2003, p. 95). Teachers, therefore, not only need to work alongside children but also actively teach specific skills and knowledge in relation to the visual art. This ensures that all children will develop the skills, confidence, competence and familiarity with a range of art mediums as identified in *Te Whāriki* (Ministry of Education, 1996). The continuum of teacher behaviours suggested by Bredekamp and Rosegrant (1992) such as acknowledging, modelling,

facilitating, supporting, scaffolding, co-constructing, demonstrating, and sometimes directing (particularly in relation to learning specific technical skills) all apply to teacher practice in relation to visual art learning experiences in early childhood contexts.

Children need challenging visual art learning experiences

Kindler (1996, p. 11) proposes that "adult intervention may not only be useful, but essential, to children's artistic development". She points out that children reach moments in their play and activity when they are ready to make important cognitive shifts or movements towards increasing their knowledge, and/or their competency in certain tasks or skill areas. Kindler (1996) further argues that adults are pivotal in providing children with experiences that enable them to move to new levels of development and competency in the visual art by providing visual art learning experiences that are stimulating, challenging, and are just above the child's level of performance (Nelson, 1980, cited in Kindler, 1995). Teachers need, therefore, to be keen observers of children's engagement in the visual art programme to be able to provide children, when they need it, with new and/or more complex activities and opportunities. This may involve introducing new types of art media to explore, or creating new opportunities to examine, critique, and discuss the art of others.

Freedman (1994, cited in Smith, 2004, p. 61) argues that a more inclusive definition of visual art is needed and that the idea of "visual culture" opens up greater possibilities for arts education as it includes "all the forms of human production that function as manifest images". For early childhood educators this would mean looking beyond the provision and exploration of traditional art forms and media, such as painting, drawing, collage, and construction, to include such things as design, fashion, photography, comic and graphic art, digital and multi-media art forms. This can lead to greater possibilities for children to explore the visual manifestation of their own and others' culture, as well as providing opportunities for adding complexity and richness to children's visual art learning experiences.

Learning in the visual art occurs as children interact socially with others

Te Whāriki (Ministry of Education, 1996, p.9) suggests that children learn best "through collaboration with adults and peers, through guided participation and observation of others, as well as through individual exploration and reflection". A three-year, action research project undertaken by New Beginnings Preschool, as part of a Ministry of Education Centre of Innovation (COI) funded initiative (Mayo, Ryder & Wright, 2006), examined how a visual art and project approach to

curriculum could contribute towards building a community of learners at the early childhood centre. The project involved employing a visual art teacher to work alongside both children and teachers to guide and encourage participation in visual art learning experiences, as well as actively encouraging parent participation. The theoretical underpinnings of the research project in relation to visual art were influenced by Reggio Emilia and a socio-constructivist approach to learning in the curriculum.

Through the course of the research project staff experienced a paradigm shift in relation to visual art provision. They moved away from a developmentalist, child-centred approach to visual art provision (where art resources or activities were presented to children with very little teacher interaction). This was replaced by an approach in which teachers began thinking about and exploring ways to develop visual art from the basis of their understandings of socio-cultural and co-constructivist ideas of teaching and learning where learning is viewed as a social activity. Through discussion, reading and thinking they determined the type of programme they wanted. They decided to "change to a paradigm where the art programme was inclusive of all age groups in the centre, integrated into the curriculum, implemented by all teachers (not solely the art teacher), and based on sound relationships among the art teacher and parents, teachers and children" (Mayo et al., 2006, p. 69). Significantly, the approach involved co-learning by children and adults.

The Best Beginnings research identified for staff the significance of social engagement as a means of supporting visual art learning experiences and recognised that "visual art is a social activity during which adults and children can engage in reciprocal relationships" (Mayo et al., 2006, p.8). Two important findings that demonstrated this understanding are described thus:

> …Visual art is more than being creative or having an experience. It is a tool that children use to persevere with projects, convey ideas and to work in collaboration with others... Copying, or observing and using the ideas of others, is a central strategy to co-learning. It involves sharing ideas and ways of doing things in a manner that all children can participate in. Children don't need to rely on language to be able to engage in co-constructing knowledge and abilities. (Mayo et al., 2006, p.9)

In another New Zealand research project, Richards (2003) examined young children's sense of artistic competency and self-efficacy. Bandura (1997, cited in Richards, 2003), found that the messages that both children and teachers give to children about their art making have a profound effect on children's sense of

competency in this domain. Richards believes that teachers should deliberately provide opportunities for children to discuss their own (and others') art work to develop art-based language and critiquing skills. She also suggests that opportunities are created by teachers so that children can teach each other skills, share ideas and assist each other with solving visual problems.

A research project by Brooks (2005), a Canadian researcher who examined the drawing process of 22 five and six-year-old children in an urban, year one classroom, also points to the socio-cultural nature of visual art learning. Her work analysed young children's drawing activities to see whether drawing can be considered a "powerful meaning-making tool" (p .80). From her analysis she concluded it was important that children were exposed to ideas through their interactions and discussions with other people, for example, with other children and teachers. Through social interaction and by engaging in the activities she provided in her classroom and in the wider community, she saw that children were able to enhance their thinking at increasingly complex levels. When drawing took place in a social context, opportunities were created that enabled children to have in-depth discussions of ideas about their drawings with each other as well as the teacher. Brooks viewed her discussions with children as hugely important as they enabled her to actively try to understand the children's emerging ideas and what they were saying in their drawings.

The social and cultural context/s in which a child lives has a significant impact on their learning

Te Whāriki (Ministry of Education, 1996) acknowledges that children bring to the learning environment significant knowledge, skills and experiences from their families, and that the community and culture to which a child belongs exerts powerful influences on children's learning. Teachers are in an important strategic position to tap into resources and knowledge about the type of visual art children experience in their communities and culture and use this knowledge to enrich their visual art programmes. By developing responsive relationships with families, teachers can discover important information about attitudes to visual art and the types of visual art experiences that are meaningful to children, their families and communities (Fuemana-Foa'i., Pohio & Terreni, 2009). Kuster (2006) recommends that teachers use the cultures of their students as the basis for visual art learning experiences. This, she argues, "can provide teachers with more effective and authentic means for increasing cultural understanding" (p. 34). An approach like this encourages teachers to become researchers themselves, and opens them up to new possibilities for their own learning.

Delacruz (1995) believes that by adopting an inquiry approach teachers can create visual art programmes that are culturally responsive. She suggests that it is important for early childhood teachers to encourage children to critique and discuss art works by posing relevant questions that help children to "look beyond themselves and enhance their capacities for understanding" (p. 104). Chapman (1985) argues that:

> …because students live in a culturally pluralistic society that is dedicated (at least in principle) to the achievement of equity, the curriculum should reflect the significance of art created for and by groups not yet well represented in the disciplines of art - the artistic accomplishments of non-Western cultures, of minority groups and women

and that teachers include in their programmes "art forms such as folk art, the crafts, mass produced objects, mass circulated images" (p. 209). By including art work that represents the culturally and socially diverse nature of early childhood communities teachers can "provide students … with opportunities to find legitimation for their values, traditions and histories" (Smith, 2004, p. 60).

3.5 Chapter summary

As early childhood educators in New Zealand become more conversant with socio-cultural theory and from this develop a congruent pedagogy which directs their teaching practices, it will be important for educators to align all the domains of teaching and learning in the early childhood curriculum with this approach. This is particularly important in visual art education as current practice in visual art education in early childhood settings appears to be still rooted in a developmentalist paradigm.

The key ideas embedded in socio-cultural theory as discussed in relation to visual art education can assist teachers to shift their thinking about the role of visual art education as well as their role as teachers. Recognising that visual art provides children with important tools for thinking and learning and that it is important for teachers, peers, parents and families to be actively involved in children's visual art learning experiences are fundamental to a successful socio-cultural visual art programme. A socio-cultural orientation is one which in itself is more culturally inclusive (Smith, 2003) and visual art programmes using this theoretical framework are likely to be culturally responsive, validating and affirming not only children's identity but also their interests, helping them to become "competent and confident learners and communicators" (Ministry of Education, 1996, p.9).

The following chapter describes the methodology used in my research.

CHAPTER 4

Methodology

4.1 Introduction

I undertook a qualitative case study that investigated the use of an IWB in a kindergarten setting, which had recently been introduced into their programme. My research specifically examined children's visual art learning experiences that occurred using the IWB. Socio-cultural theory provided the theoretical framework to analyse the data. This was also used to explain teachers' interactions, approaches and teaching strategies using an IWB to enhance children's learning. I collected data through: focus group interviews with teachers and parents; participant observations; and teachers' narrative assessments of children using the IWB.

4.2 The research questions

My key research question was:

- How do teachers and children use an Interactive Whiteboard for visual art learning experiences in a kindergarten setting?

This guided my research focus but there were also a number of sub-questions:

- What knowledge and experience did teachers and children bring to their use of an Interactive Whiteboard for visual art learning experiences?
- What teaching strategies did teachers employ to assist children to use the Interactive Whiteboard for visual art learning experiences?
- What learning strategies did children use when using the Interactive Whiteboard for visual art learning experiences?
- What evidence was there of socially constructed learning for both the teachers and the children using the Interactive Whiteboard for visual art learning experiences?

4.3 A qualitative approach

Qualitative research methods were used extensively in this thesis. Denzin and Lincoln (2005) broadly define qualitative research as:

> …a situated activity that locates the observer in the world. It consists of a set of interpretive material practices that make the world visible…This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them. (p.3)

Using a qualitative approach allowed me to explore how an IWB was used authentically in an early childhood kindergarten setting. Denzin and Lincoln (2005) state that the advantages of using a qualitative research approach include:

- The ability to study phenomena and behaviour in their natural settings, such as a kindergarten environment.
- To be able to use a variety of sources for data analysis to help describe the phenomena being researched, such as personal experiences, interviews, artifacts, observations, and texts.

The gathering of a rich variety of data helped to capture the reality of the environment in which the research was done, and recreated, as far as possible, the authenticity of the context. A qualitative approach also enabled me to examine the positive affordances of the new technology being studied, as well explore some of the constraints and issues that were experienced by participants. According to Denzin and Lincoln (2005), "qualitative researchers are more likely to come up against the constraints of the everyday social world. They see this world in action and embed their findings in it" (p.12). Studying both the positive affordances and the constraints of using an IWB for use in the visual art assisted in establishing a balanced interpretation of the data.

My key research question required investigation into how the teachers and children used an IWB for visual art learning experiences in a kindergarten setting. Yin (2003) points out that research questions asking 'how' or 'why' certain phenomena occur are "likely to lead to case studies, histories and experiments…" (p. 6). He views these as appropriate research methods because "such questions deal with operational links needing to be traced over time…" (p. 6) which can help the researcher to explain what is being studied. 'How' and 'why' questions are the focus of this study, using a case study approach.

4.4 The case study

A case study is an appropriate mode of inquiry that has a qualitative orientation (Creswell, 2003; Denzin & Lincoln 2005). Useful for small-scale research projects Yin (2003, pp.13-14) defines a case study as:

> …an empirical inquiry that investigates a contemporary phenomenon within its real life context…[and which]… copes with the technically distinctive situation in which there will be more variable than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion… and as another result benefits from the prior development of theoretical propositions to guide data collection and analysis.

An advantage of using a case study, Burton (2000, p. 177) maintains, is that the topic of study can be "an event such as some aspect of organizational change, or implementing a new programme". The introduction of the IWB involved some changes to the case study kindergarten's visual art programme.

The case study offered the opportunity to collect rich and informative data. Yin (2003) states that data collection for case studies relies on many sources of evidence and identifies six important sources: archival records, documentation, interviews, direct observation, participant observation, and physical artifacts. He argues that no single source is advantaged over all the others and that the various sources are highly complementary. Hence, a good case study will use as many sources as possible. In this study documentation, focus group interviews and direct observations were used. The following section considers each of these.

4.5 Participant observation

A participant observation approach was used to examine children's and teachers' interactions with the IWB for visual art learning experiences. My original research proposal involved participant observations of all the children attending the morning session using the IWB. However, modifications were made after recommendations by the Ethics Committee that the study include a group of eight focus children to create a purposive and quota sample (Denscombe, 1998). The eight focus children were selected with the assistance of the teaching team at the kindergarten and were chosen on the basis that they were skilled or had experience using the IWB. The focus group consisted of: 2 four year old boys, 2 four year old girls, 2 three year old boys and 2 three year old girls. An extra child, a four year old girl, was added to the focus group as teachers felt she was a particularly skilled user of the technology and should be included in the study. This raised the number of focus group children to nine. Other children who actively used the IWB were also observed and included in this study.

I conducted participant observations during the kindergarten's morning sessions from 9:00 a.m. to 12:00 p.m over a four-week period (19 November to 16 December 2007). This involved observation of the five kindergarten teachers and all the 40 morning children attending the session, but with a specific focus on 9 selected focus children. Children and teachers were observed primarily using the IWB in relation to visual art learning experiences during the kindergarten session. Their work with the IWB was discussed with them either while they were engaged with the work or after the process. This occurred informally throughout the morning, working within the scheduled programme and did not involve an observation schedule. Observations of parents working with their children at the IWB were also recorded. In agreement with Bloor and Wood (2006), the advantages of participant observation are that the researcher is able to "observe actions/interactions, behaviour and listen to conversations while simultaneously observing the context (particularly the time and location) in which these actions are undertaken" (p. 71).

The majority of my observations (90%) were video recorded and/or photographed and field notes were taken. The data were stored digitally on a laptop computer. The recordings of the data were made available to teachers and children throughout the research process in several ways: in a daily diary format (photographs and text), by printing off large photographs of the children using the IWB (displayed on the wall next to the IWB by the teachers), and letting children review the video clips on my laptop. This assisted with the transparency of the data collection and for checking with particpants to ensure the data were correct. The sharing of the data also enabled teachers to sometimes use the data as a reflective tool with the children to think about and discuss the learning that was taking place. As Denscombe (1998) puts it, participant observation allows researchers to experience situations from an insider's perspective, enabling them to "become aware of the crucial factors explaining the culture or event" (p. 149).

During the data collection as a participant observer I sometimes experienced a tension in my role. On some occasions I wondered about how much it was appropriate for me to intervene in the daily life and functioning of the kindergarten routines. There were some issues arising with dealing with some of the children's behaviour where the urge to take on a teacher's role was a struggle for me. This situation was discussed with staff and it was established clearly that I was not responsible for this. The level of my actual engagement with children using the IWB and discussing their work with them also sometimes created a tension between taking on a teacher's role as opposed to a researcher's role. However, this tension was resolved by deciding that when I needed

to seek clarification or greater understanding about a child or children's activities on the IWB I could ask them questions and/or discuss their work.

The inclusive nature of the early childhood setting, my existing good relationship with staff and children at the kindergarten, the inevitable curiosity of young children and their often persistent demand to engage with me created opportunities for effective participant observation. In fact, the ability to play the "aloof observer" (Wolcott, 1995, p. 100) would have been almost impossible in this context. Being a participant observer was helpful in that I was able to elicit deeper understandings of events by actually being able to discuss and experience the activities with and alongside the children and teachers as they happened.

4.6 Interviews with teachers

I share Yin's (2003) view that the interview is one of the most important sources of case study information. Focus group interviews were used in this research as a means of accessing information, opinions and viewpoints of the entire teaching team at the kindergarten in relation to the use of the IWB for visual art learning experiences. The advantage of conducting focus group interviews rather than individual interviews, according to Denscombe (2007), is that:

> Listening to one person at a time effectively restricts the number of voices that can be heard and the range of views that can be included within a research project. Group interviews, however, provide a practical solution to this. By interviewing more that one person at a time the reseacher is able to dramatically increase the number and range of participants involved in the research. (p.177)

This approach to interviewing was not only more inclusive but also a good 'fit' with the democratic philosophy and management of the kindergarten where staff regularly discussed issues relating to the programme and/or the children as a team.

One focus group interview involving all five teachers was held at the kindergarten on 26 November 2007. The list of questions for the interview were given to the teachers in advance (see Appendix I). These were used to guide the discussion but often led to new questions being asked by both myself and the participants, enabling the participants to expand on what they were saying. The focus group interview took one and a half hours. The session was tape recorded and then transcribed by me. Copies of the written transcripts were given to the participants to check for accuracy (Bloor & Wood, 2006) a week after the interview took place. These were accepted as a true and correct record by the teachers and no changes were required.

4.7 Interviews with parents

A focus group interview with the parents of the nine focus group children was also part of this research. Wilkinson (2004) maintains that the style of a focus group interview can be very natural and can include "a range of communicative processes – such as story telling, joking, arguing, boasting, teasing, persuasion, challenge and disagreement" (p. 180). The focus group interview included many of these processes and helped me to create good rapport with the parents within a relaxed environment. This helped elicit a good range of responses from the participants.

The advantage of using a focus group interview was to create a group discussion and generate a range of ideas and opinions (Denscombe, 2007). I felt it was also an efficient way of using time (Wilkinson, 2004) for both myself and the parents. They were invited to attend only one meeting at a specific time and venue.

Only four parents turned up for the interview, all of them mothers. Parents who did not attend gave no reason for their non-attendance. The interview was held at one of the seminar rooms at the neighbouring school. This was because there was limited space at the kindergarten for holding the meeting and also to minimise the possibility of the participants being distracted by their children. The kindergarten teachers took responsibility for caring for any younger siblings so the mothers could participate without being responsible for them. The interview was held during a morning kindergarten session so that the teachers could assist with childcare on 4 December 2007.

Copies of the questions were given to participants before the interview (see Appendix J) as I felt this would be helpful for the parents to begin their reflection process. The focus group interview took 50 minutes. The session was tape recorded and then transcribed by me. Typed copies of the written transcripts were given to the participants to check for accuracy two weeks after the interview took place. These were accepted as a true and correct record by the parents and no changes were requested.

4.8 Analysis of teachers' documentation

Another source of data collection used in this case study was the analysis of teachers' documentation that assessed young children's engagement with the IWB for visual art learning experiences. Yin (2003) asserts that "the most important use of documents is to corroborate and augment evidence from other sources" (p. 87). These were analysed alongside the other data I collected, providing another source of triangulation.

At the case study kindergarten the teachers use Learning Stories (Carr, 2001), a form of narrative assessment, to examine and assess children's learning. The Learning Stories include written text, photographs and/or other visual images – such as scanned or digitally converted drawings or art work created by children. Four out of the five teachers provided me with Learning Stories they had done on individual children using the IWB for a visual art learning experience (see Appendices K, L, M, N, O, P and Q). Four Learning Stories had been done prior to my research being carried out. The other three Learning Stories were done during the time I carried out my research (14 November – 6 December 2007).

4.9 Ethical considerations

MInimising risk

There is always the possibility of causing a slight disruption to the programme by being a participant observer. The manager of the kindergarten association, the teachers and parents were alerted that this might occur through the Information Sheet (Appendices A, B, C and D), and at a meeting held prior to the study taking place to inform them of this and other likely issues that could arise from the study. To minimise any disruption at the kindergarten, it was agreed that the observations would take place only during the morning session. Teachers were also informed that the observation process would involve the taking of written field notes, digital photographs, and video recordings. These were stored digitally on my laptop and were available to them for review at all times. Teachers and parents were given information about the procedures for the focus group interviews as well as the questions that would be asked at the interviews (see Appendices I and J). In following such protocols my intent was to deal with issues of reflexivity and power through "reducing or controlling the effects of the researcher on the research situation" (Davies, 1999, p.4), and thereby increasing the objectivity, reliability and the validity of the data collection (Denscombe, 1998, p. 212).

Consent

Consent for the research was attained through signed consent forms from the manager of the kindergarten, the teachers and parents (see Appendices E, F, G and H). It was agreed that data could be discussed by my supervisor and myself. Confidentiality for individuals was maintained by using pseudonyms for children's, teachers' and parents' names. The name of the centre was not identified. Parents and teachers gave consent to allow the data to be collected through the methods outlined and consent was given to use the material in my thesis and other publications.

Storage, access to and disposal of data

During the course of the research all the written data, video files and photographs were kept securely in a locked file and accessible only by me. My computer has a password so that data stored on it were accessible only to me. After five years the written data used in the research are to be destroyed and any video/photographic data wiped.

Feedback to participants

Regular feedback sessions with the participants was scheduled formally during the research process, for example, at teacher staff meetings, but this was actually done informally with teachers as they worked on the floor. Feedback to parents also occurred informally during the observations, for instance if a parent was visiting the centre and wanted to discuss progress or procedure. When children wanted to view any video recordings or photos taken of their activities, feedback was given and discusion took place informally during session times.

Conflict of Interest/Conflict of Roles

According to Robson (1993), good case study researchers should be unbiased by preconceived notions, along with those derived from theory. Researchers, therefore, should be sensitive and responsive to contrary findings. This was an important consideration for this study as I am currently a lecturer and professional development adviser at Victoria University of Wellington College of Education in the School of Educational Policy and Implementation. My specialist area of teacher training and professional development is in the area of visual art education and I am an artist. I also provide professional development to early childhood centres wishing to develop their use of ICT (as I did with this kindergarten) and I am interested in the use of ICT in early childhood settings and the way in which early childhood teachers are beginning to embrace new technologies. I was conscious that my subjective position might influence how I analysed and interpreted the data. However, in agreement with Mutch (2005), my interest and expertise in these areas were helpful when carrying out this research.

4.10 Analysis of data

In this study Denscombe's (2007) five stage process for qualitative analysis was utilised. The following section considers the use of each of these.

Preparing the 'raw' data

The raw field notes made daily as I engaged in participant observation were written in a note book which I kept with me as I engaged with children and teachers. Photographs and images were taken with a digital camera (which had the capacity to record both still and moving images) to accompany the participant observations. The 'raw' data were written up in the afternoon immediately after leaving the kindergarten as a journal/diary, in a Word document format. This included inserted photographs that I felt related to the subject being observed and reflected upon in the journal. The immediate interpretation of the raw notes into the journal format enabled me to be systematic about interpreting the thick descriptions (Bloor & Wood, 2006) in the raw data, and also reduced the possibility of forgetting vital information.

This method of journaling in digital form enabled me to keep the photographic and other images (such as children's drawings on the IWB) closely connected to the written data and allowed me to collate material as I went along. This was helpful in terms of preparation of data for use at a later date, and also had the double advantage of being able to be printed off daily (and placed in a clear-file plastic folder) so that teachers, children and parents could have access to the material if they wanted to view and check on what was being recorded. The daily visual material that was recorded (photos and video) was stored on the laptop, identified by the day and date, and filed in a dated daily folder, which was kept in a dated weekly folder. This sorting of material proved to be helpful as preparation for the analysis.

The teachers' assessment (Learning Stories) documentation was provided by the teachers throughout the research gathering process. This was kept in a clear-file folder in my office. The seven pieces of assessment documentation have a very clear, straightforward format that did not require reorganising for data analysis.

Becoming very familiar with the data

Throughout the process of data gathering I constantly went back to the material as I reproduced it daily for the teachers, children and parents at the kindergarten. Reflection on the learning taking place with the teachers, and sometimes the children, further enhanced familiarity with the material.

The journal format with the embedded photographs had created a very accessible resource for reflecting on the material making it a very easy process to view the

documented material. Key photographs were part of the journal, but remaining photographs and video material have been successively viewed throughout the process of analysis. During the analysis stage of the research process I was invited to present some of my initial findings on the role of ICT in young children's visual art education in a keynote address at an ICT conference for early childhood teachers (Auckland, July 2008). This opportunity also enabled me to delve into my material again, and consequently I developed even more familiarity with the data. Corbin and Strauss (2008) suggest that presenting research findings can be extremely useful in helping to "clarify thoughts" (p. 275) and developing a keynote paper assisted my thinking about the analysis of some of the data.

Interpreting the data by identifying key themes, and using a socio-cultural interpretive framework

Key themes were identified by closely examining the data accessed by different modes of inquiry – participant observation, group focus interviews and analysis of the teachers' assessment documentation. The research was a small scale case study and the pool of data was very manageable and did not require complex coding for themes to be extrapolated. Themes became apparent as I was guided by my research questions, information provided in the literature review, and socio-cultural theory (see Chapter 3). Each type of data elicited a range of key themes or phenomena which sometimes identified similar ideas/information found in other data sources, or the themes were specifically identified by that particular mode of inquiry.

Verifying the data

Denscombe (2007) suggests that triangulation assists with establishing the validity/credibility of research. This involves the use of more than one data source to give the researcher more than one reference point for data analysis. Corroborating information from the different data sources enhanced the accuracy of the findings. Using different facets of enquiry also gave me a fuller picture of what was happening in the data. The three types of data collection activities used in this study (participant observations, focus group interviews, and existing documentation) formed a sound base for triangulation.

Member checking, another variant of triangulation, involves "checking the accuracy of findings with research respondents" (Bloor & Wood, 2006, p. 170). This was done regularly with the teachers, parents and children at the kindergarten, fitting neatly with the reflective practice currently used at the kindergarten. To ensure the reliability of this case study research (by enabling similar research to be replicated in

another setting), detailed discussion of the methods used to gather the data, constituting “an audit trail” (Denscombe, 2007, p. 298) has been fully described at the beginning of the chapter.

Making the process involved in the analysis clear and concise

While analysing the data it was important to consider the data carefully and recognise the need to, as Denscombe (2007) suggests, represent only the significant aspects of the data which supported the key themes that emerged. This process required thoughtful consideration and editing of material, as well as presenting the information in written form so that it “conveys a sense of authority and authenticity” (p. 303). Throughout the process of developing this thesis, several drafts were developed and in the process, information was regularly refined to produce the final research findings.

4.11 Chapter summary

This chapter has outlined the methodology used in this study and has highlighted the methods and approaches used to collect data to answer the research questions. It described the ways in which qualitative data were collected through participant observations, analysis of teachers’ Learning Stories, and through focus group interviews with teachers and parents. Ethical considerations were discussed and methods for accurate data analysis were identified.

The following chapter looks at teachers’ visual art pedagogy and practice in relation to the use of the IWB.

CHAPTER 5

Visual Art Pedagogy and the IWB

5.1 Introduction

This chapter examines the case study of teachers' visual art pedagogy and practice and how this influenced the way the IWB was used to support the children's visual art learning experiences. It was important to understand the teachers' pedagogy in relation to their visual art programme so that I could adequately answer my research question about the teaching strategies that were employed to assist children to use the IWB for visual art learning experiences. Using data from the participant observations, the Learning Stories and the focus group interviews, several key themes emerged. These are:

1) The role of the teacher
2) A process rather than product approach with the IWB
3) The significance of time for children's visual art learning experiences with the IWB
4) The ability to transfer skills from the IWB to other mediums and vice versa
5) Supporting children's interests
6) The provision of large, physical drawing opportunities
7) The level of teachers' skill and experience.

Each theme is explained in depth. In this chapter, too, I discuss the teachers' individual levels of skill with the IWB and how this impacted on their confidence and competence with the technology.

5.2 The role of the teacher

The first key theme discusses the role of the teachers in relation to the art programme they provided. At the case study kindergarten, visual art learning experiences were integrated into the kindergarten's holistic, play-based programme. Children were freely able to use a range of traditional core art media, for example, painting, drawing, clay, construction, collage, and printmaking as well as the IWB. I observed that teachers supported children's visual art learning experiences mainly by setting out a range of art resources and materials that they could use for their explorations in designated art areas. How the children used the materials was not dictated by the teachers in any way and they had free access to activities. Children's art works with traditional materials were able to be taken home when they were completed.

Image 2: Children engaging with traditional art materials set out by the teachers in the central art area

At the focus group interview the teachers were asked about the type of visual art programme the kindergarten offered. The teachers were in agreement that their visual art programme was essentially child-centred and child-lead (Bressler, 1994) and involved ensuring that appropriate art resources were provided. This allowed children to use them freely without too much teacher direction or input. From discussion with the teachers they said that if they noticed that there was a need to provide new materials or there was a gap in the programme, emphasis would be placed on this and teacher input would be provided to enhance children's skills with the specific material.

The teachers clearly stated they needed to provide children with technical knowledge that would assist creative explorations but not direct their creative ideas. One of the teachers, Kathy, described using strategies such as modeling, discussion, encouragement, and using a resource book for helping children use clay. She felt these were useful teaching strategies for generating ideas, facilitating and scaffolding children's learning. In this instance, Kathy outlined how she preferred to use the resource book to focus on technical instruction rather than showing the children adult examples of clay work that were also included in the resource book.

Furthermore, Kathy saw her role as one which supported children to take risks with materials and help them not to be afraid to try new things. Once children had mastered new techniques and had become skilled then Kathy felt she could step away from the situation and let the children provide the expertise and support for each other. The emphasis on children learning specific skills to become empowered

to control their own creativity and be in a position to help others appeared to be a significant part of the visual art pedagogy at the kindergarten. Kathy stated:

> When they started taking over I actually stepped back and [when] other children became interested [I would say]"Oh you need to go and ask so and so" because they were our experts! (26/11/2007)

My observations of the case study kindergarten teachers indicated that they generally adopted a set-up-stand-back approach (Lewis, 1998; Richards, 2003) with the traditional art activities, which involved setting out materials but displaying low levels of interaction with children engaged in visual art learning experiences. The technical complexity of the IWB, however, sometimes needed a different response from the teachers, creating far more interactions with children in their art learning activities with the IWB, particularly as they were teaching children new skills.

I found that the technical complexity of the IWB for children's visual art learning experiences created opportunities for teachers to scaffold and discuss children's learning both with the technology and, in a small way, with the drawing process itself. Several observations of teachers engaging with children showed that as they sat by them and demonstrated how to use the technical tools of the IWB or how to save work, they created opportunities for socially constructed learning by entering into conversations about the drawings and by using strategies such as questioning, prompting, and praising children's efforts. An excerpt from my notes highlights examples of this:

> Martha also has a go with the Board scaffolding a couple of children and using lots of interesting language about Seb's (aged 3 years, 9 months) drawing as well as using the technical language needed for scaffolding the process. I go out to observe him. He enjoys covering the surface with colour and then using the rubber pen to rub out the image. He discovers by randomly pressing icons the page turning icon and is delighted by all the pages that appear from his tapping but he gets confused about finding the pen tool again and Martha has to help him navigate this complex step. (26/11/2007)

Sometimes the IWB gave the staff the opportunity to work alongside children, using the IWB as a tool to initiate conversations with the children (see image 3). In the process of developing rapport they often scaffolded children's drawing on the IWB. The following interaction with Krissie, a child who would not talk to teachers, illustrates this.

> I hear Kuini starting to work with Krissie (aged 4 years). She is encouraging her to do a drawing – Krissie is a very quiet child and won't talk to the teachers but is great on the board. Kuini scaffolds her quite a lot through some aspects of the Board e.g., the pens, using the fill colours to change the background. Kathy joins the group so two teachers are present, and several children. I join in too, taking a video. Krissie does a picture of her family,

answers Kuini's questions about the drawing of her family with nods but doesn't actually speak. She spends a long time working on her drawing which at first depicts her family as figures but becomes more abstract as she explores the board for herself. (22/11/2007)

Image 3: A teacher encouraging and discussing a child's drawing of her family

The teaching strategy of scaffolding is one in which adults (or more competent peers) guide and support children's learning, enabling them to move from one level of competence to a higher level. Usually a graduated process of support is offered where "the adult or more expert peer gradually releases control of the child as she or he becomes more able to accept responsibility for task completion" (Jordan, 2004, p.32). Terreni (2005) proposes there are certain environmental conditions that will allow this type of teaching to occur successfully, for instance, teachers/adults having the opportunity to spend time with children in 1-1 situations or in small groups, for sustained periods of time. She suggests that the types of appropriate techniques that can be used to scaffold children's learning involve strategies such as "questioning, prompting, confirming, modelling, praising, encouraging, discussing, and reflecting" (p.46). This practice was further highlighted in the Learning Stories (see Chapter 7).

Similar to their strategy with the traditional art materials, teachers stepped back once they felt that children had the skills to use the IWB by themselves, and employed their 'expert' philosophy where skilled children could guide and support other children. The role of children scaffolding each other with the IWB is discussed in more detail in Chapter 7.

Setting up the physical environment was another important consideration that was commented on by teachers when I asked them about how they set up the visual art programme. As well as the provision of a well-resourced art area, traditional art

materials were sometimes moved around the kindergarten so that children had easy access to them and to ensure visual art learning opportunities captured a variety of children in different areas. For example, art materials were often available outside on the verandah so that children who preferred to play outside could have art materials which were close at hand.

From my observations and discussion with the teachers it was evident that the teachers' visual art pedagogy subscribed to goals described in *Te Whāriki* (Ministry of Education, 1996), which consists of several learning strands that guide practice. In particular, the Communication Strand states that in early childhood settings children need to have visual art learning experiences that will:

- Assist them to become familiar with "the properties and character of the materials and technology used in the creative and expressive arts" (Ministry of Education, 1996, p. 80). Kathy's description of how she supported the children's use of clay provides an example of this. This was also evident in the way the teachers assisted the children to become familiar with, and learn how to use, the IWB as a tool for visual art.
- Develop "skill and confidence with the processes of art and craft, such as cutting, drawing, collage, painting, print-making, weaving, stitching, carving, and constructing" (Ministry of Education, 1996, p. 80). By providing a range of these traditional materials for free-play, children were able to explore independently and experiment with most of the mediums described above, developing skills and confidence with material through teacher guidance when it was deemed necessary, and with input from expert peers.
- Encourage children's understanding that skills with media "can be used for expressing a mood or a feeling or for representing information, such as crayons, pencils, paint, blocks, wood…" (Ministry of Education, 1996, p. 80). During the course of the study I sometimes saw teachers engaging with children in discussion about their art works with traditional material to discern the information being represented by the work. For example, this occurred in a semi-structured drawing session with the children who were making Christmas calendars to give to their families. However, with the IWB this was a much more evident feature of teacher/child interactions.
- Develop "increasing familiarity with a selection of the art, craft … which are valued by the cultures in the community" (Ministry of Education, 1996, p. 80). The art works made by traditional art materials created by the children were clearly valued – through wall displays, and by being able to take completed work

home to show to their families. The art on the IWB was valued by teachers but there was limited evidence of completed art work due to it not being printed off, displayed on the walls, or sent home digitally. I wondered whether the work was actually seen, and thus valued, by the families and community. This is discussed more fully in the preceding section.

5.3 Process rather than the product

Another theme that emerged was the teachers' philosophical belief in the importance of the process of art making as opposed to the resulting product. In a traditional visual art programme children can experience the physical permanence of their completed work and either take it home or have the work physically displayed in the centre. On the other hand, at the time of this study, the children's work on the IWB was predominantly a one-off, in-the-moment experience. Although the IWB had printing capability, most of the time to be able to review their work children had to have saved their work and then retrieve it from a computer file. As most children required teacher assistance for this step, work was not always saved. However, I observed that in the teachers' early Learning Stories, they had often converted a child's drawing that was significant into a .jpg file and inserted it into a story (created as a Word document) with a commentary on the children's thinking and processes.

The Head Teacher, Kuini, felt that to print off hard copies was expensive and, most significantly, would change children's and teacher's expectations of the IWB. Kuini, at this point, was not ready to do this. She said:

> And I don't think it's the end result that's guiding things. It's the process that is so visible [and] that's more important and I'm not ready for a printer to go there yet because it would totally change things …. and I'm not ready for that change. (26/11/2007)

Another teacher, Martha, remarked that the ability to print hard copies might result in children rushing their work in order to get something printed off. Kuini suggested work that was saved and then printed would have to highlight some aspect of a child's learning that was significant, and teachers could then use the work in their narrative assessments. Examples of this practice are evident in some of the Learning Stories made available for this research (see Appendices K-Q) and are discussed in Chapter 7.

Richards (2005) points out that the concept of 'process rather than the product' being the most important aspect of a child's visual art learning experiences resonates with a developmentalist, child-centred approach to visual art education

that is still frequently found in early childhood settings. However, in this case the complexity of adding the step of allowing children to print their work was obviously something the teachers had to grapple with; for example, the expense of activating this part of the process needed to be carefully considered. This affordance of the IWB was an aspect that Kuini felt required on-going discussion from the teaching team to ensure that printing children's work actually assisted their learning and that it sat comfortably with their visual art pedagogy.

5.4 Time

A third theme that emerged was the amount of time children were given for visual art learning experiences. Children were given unlimited time to explore the IWB for their visual art learning experiences, just as they were with traditional art media. This gave the children an opportunity to fully explore their creative ideas. Further, the flipchart affordance of the IWB programme enabled children to do several pictures in one session which was helpful if they wanted to spend time developing themes or ideas in their work. Having unlimited time also gave them the opportunity to become fully conversant with how the drawing tools worked, and to play and experiment with these.

What is sometimes apparent in early childhood settings is that teachers often limit children's time using computers (Oldridge, 2007). My own experience and observations of computer use in early childhood settings has shown that children rarely have unlimited time on computers as ensuring access is fairly distributed amongst the children is often considered most important, and consequently managed by applying time restrictions. In the focus group interview the case study teachers talked about how they often found themselves defending their position when other teachers came to visit to see the IWB being used. Their argument was that in other curriculum areas children did not have time restrictions placed on their learning and that this should be the case with the IWB as well.

This is also supported by *Te Whāriki* (Ministry of Education, 1996) which emphasises the need for children to have time to explore materials and resources in order to develop their creative ideas by allowing "ample time to return to favourite activities and areas and for the repetition and practice of developing skills and interests" (p. 61). In relation to ICT, Loveless (2007) suggests that creative processes need to be "supported by opportunities for play, exploration, reflection and focussed engagement with ideas" implying the need for children to have adequate time for this.

5.5 Transferability of ideas into new mediums

The fourth theme that emerged was the way children were able to transfer their ideas developed with the IWB into other art mediums. Of particular interest to me was the way in which the IWB appeared to sometimes motivate children to engage in other visual art learning experiences using traditional art materials. This phenomenon was noticed in an observation of Vahini (a focus child, 3 years, 8 months) who was using the IWB to create a large purple drawing, literally filling the page with a pile of purple (see Image 4) which she described as a purple rock. A few days later I noticed a painting done by Vahini that appeared to use paint in a comparable manner (see Image 5) and exploring similar ideas in relation to colour and construction of her image.

Image 4: Vahini's drawing on the IWB of a purple rock (16/11/2007)

Image 5: Vahini's painting (19/11/2007)

I was made aware of this learning process earlier when I read one of the teacher's Learning Stories which also recognised that children sometimes transferred their ideas from the IWB to traditional media. See, for example, the Learning Story *Rachel's Flower* (Appendix K) which is discussed in detail in Chapter 7. However, I

also observed this happening in reverse when Kuini had deliberately positioned a table with felt pens and paper next to the IWB. She described how she intended this to be a 'provocation' for the children, in order to motivate them to use the IWB. I observed children's behaviour as a result of this intervention throughout the morning. At one point three children, Campbell (one of the focus children aged 4 years, 4 months), Ansell (aged 4 years, 3 months) and Seb (aged 3 years, 9 months), were working at the drawing table. Campbell and Ansell stayed with the traditional media and when they had finished drawing moved away to create a collage, again using traditional art materials. Seb, though, moved to the IWB to undertake a drawing immediately after completing his drawing with traditional media (see image 6).

Image 6: Campbell and Ansell stay working at the drawing table while Seb moves to the IWB after drawing at the table

5.6 Supporting children's interests

A further theme emerged which related to how the IWB was able to support children's interests. Encouraging children to explore their interests in visual art learning experiences, with traditional media and on the IWB was an important dimension in this kindergarten's visual art provision. An interest-based approach to fostering learning is underpinned by the early childhood curriculum (Ministry of Education, 1996). Children created the types of images that interested them on the IWB and this was done either independently by children or with encouragement from teachers. For instance, in two different observations of Tom (a focus child, aged 3 years, 4 months) I noticed his interest in exploring and digitally manipulating shapes and images from the digital image library (see images 7-10). An excerpt from the observations describes Tom's interest in changing the colour of the images using the digital fill tool:

> He [Tom] gets on the Board and he also has a really long time exploring icons … He prefers exploring the different icons and enjoys the image library with

the different aspects of the house that come onto the Board when he selects them from the image file at the bottom of the screen. Like Arana he decides to draw over one of the images but he discovers the fill button and has a fabulous time changing everything in the room to a different colour. At one stage he systematically works through changing the carpet to the different colours in the menu (see images 19-22). Michelle joins him and is equally delighted with this exploration even though she is a spectator…she makes suggestions about the colours to him and he sometimes obliges. (28/11/2007)

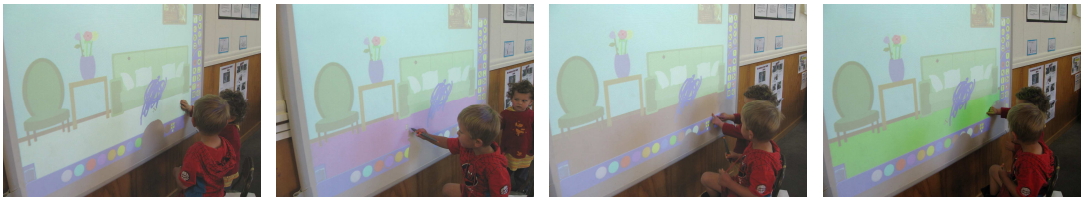


Image 7 – 10: Tom's white carpet, purple carpet, orange carpet, green carpet.

The exploration of the colour changing gets quite frenzied and Tom pounds the Board with the pen onto all the different objects…he gets to be able to change everything to one colour, even the photograph that is hanging on the wall in the interior image of the house he has selected (see image 11). Seb joins him on the chairs and is an active spectator…(28/11/2007)

Image 11: Tom changing the colour of everything in the room to blue as Seb actively observes

This type of exploration was evident, too, when I was observing Alex. Alex (a focus child aged 4 years, 1 month) had an on-going interest in building constructions with the blocks (that were located next to the IWB), and I invited him to create a picture of his block building on the IWB (see image 14). He did this enthusiastically and during the process regularly moved from the drawing back to his building to check to see if he was drawing the pieces correctly. During the drawing process I noticed he began to make the pieces different colours and he embellished his work with various shapes and the letters of his name (see images 13 and 14). This example indicated how the teacher can be instrumental in encouraging children to use the IWB to transfer their knowledge and interests into a new medium, in this instance moving from concrete to abstract representation.

Image 12: Alex's block building

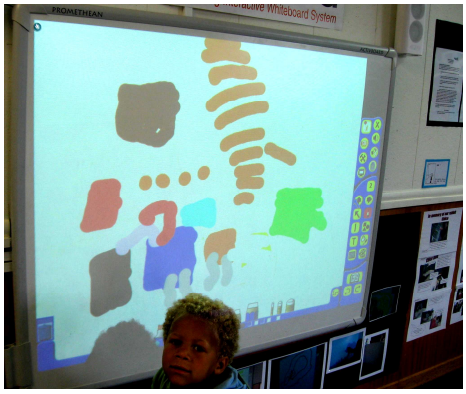


Image 13: Alex's drawing on the IWB

Image 14: Detail of Alex's drawing on the IWB (converted to .jpg format)

5.7 Large, physical drawing opportunities

A further theme in the study identified was that the IWB created opportunities for children to engage in large drawing exercises. Traditional mediums offered at the kindergarten ranged from very small pieces of A4 and A5 paper for drawing and collage, to the largest A3 size (which measures 297 x 420 mm) for painting. The IWB measures 1170 x 890 mm, which is four times the size of the largest piece of paper available for art making at the kindergarten. The opportunity to do large drawings regularly involved a higher degree of physical movement by the children, who often moved their whole bodies to create lines and circles on the board (see image 15). This was commented on during the focus group interview. Kathy discussed how much the children enjoyed this affordance, describing how the children loved the large drawing exercises that were sometimes provided by laying large sheets of paper on the ground. She noted that this was a hard thing to do regularly so the IWB was very helpful by providing a big drawing surface.

I also observed that sometimes children enjoyed the sound of thumping the IWB with the pen which created both sound and a digital mark – a dot. As Wright (2007)

points out, a child's drawing and meaning-making is often "a synthesis of thought, body and emotion" (p. 48). This physicality in the drawing process was relished by many of the children, and I felt this was often integral to their drawing process on the IWB.

Image 15: A child using a big sweeping movement to create the lines in her drawing

5.8 Level of teachers' skill and experience with the IWB

The final theme that emerged from the study was that the teachers' skills and experience using the IWB varied considerably amongst the team. Kathy and Kuini, who initiated the installation of the IWB and had received some technical training from the ACTIVboard reps, were observed to be the most confident and competent in their use of the IWB. Martha, Tanya and Surija, the newest members of the teaching team, did not have this same level of training and tended not to use the IWB as often or as confidently. Nonetheless, all teachers used the IWB with children in a variety of ways (see Learning Stories, Appendices K-Q).

Martha, Tanya and Suirja identified that one of the difficulties for them to develop skills with the IWB was having the time to play around with it and try things out for themselves. Martha, for instance, remarked:

> It's quite exciting and ideally it would be nice to have a weekend and have a good play around on it …I haven't had the time but ideally that would be the way to go. (26/11/2007)

The kindergarten had recently undergone a radical change in its operational structure and increased the number of children attending. This, in turn, impacted on the amount of time available to the staff. For the new staff, settling into the kindergarten and getting to know the other teachers, the children and their families

was a significant factor that took most of their time. For Kuini, the Head Teacher, creating good team dynamics and establishing the basic pedagogical understandings between them were considered a priority but was very time consuming. Nevertheless, it was agreed by all the teachers that the IWB technology was complex and did require time to get to know how to use it. As Kuini pointed out:

> …we're just at the beginning [but] I don't think I'll get there by the time I'm old enough to retire! (26/11/2007)

The new members of the teaching team had had some training from Kathy and Kuini but the 'hands-on, have a go' approach appeared to be one of the main ways they were encouraged to discover how the IWB worked. Martha identified that she drew on the more skilled teachers' expertise but sometimes learnt from the children who also taught her things on the IWB. She commented:

> For me it's been a little bit of training with Kathy, asking her questions…it's been hands on, having a go. And also with the children sharing their knowledge cos they know more than what I do so that's been very empowering for them too…yeah I'm just learning as I go along really. (26/11/2007)

Suriya's experience was similar to Martha's and she said:

> The children have taught me most of the things and I ask Kuini or Kathy, and Kuini put the software on our laptops so we can use it at home…I have used it a couple of times but I still have a long way to go. I used it once at mat-time so I need to build that confidence…I made a video with the children outside and then revisiting [on the board]… (26/11/2007)

In line with Martha and Surija's experience, Tanya learnt by observation. She remarked:

> Watching the children mainly and just like connecting it all up…it was a bit of a mission at first but that was Kuini and Kathy showing us. But mainly on the drawing and how to put the things up [pens?] it's the kids…I've just been watching the children. And then I'd go and do it and something would go wrong and like "how do you get it back to that?" and I didn't know how to turn the page until the kids told me. So it's more the children that I've been watching and they have been showing me but I still have a long way to go. (26/11/2007)

All the teachers were aware of the potential of the IWB for enhancing their teaching (for example by creating more flip charts, developing the image library, showing children's photos on the IWB) but recognised that they had yet to realise this in their own teaching. Kuini, one of the more experienced teachers, demonstrated her feelings about the complexity of the technology:

> Here's the Active Board information – my hands are wide apart…and I'm here [finger-width apart]! I know a little bit, it's humungous and I'm way over here. (26/11/2007)

The teachers' comments indicated that access to appropriate and affordable professional development was an issue for them. Whilst initial training from the first ACTIVboard rep had been relevant and appropriate for the kindergarten context, the teachers identified that subsequent work with the company after this had not been as useful. From a discussion I had with the Promethean manager at the time of the study there appeared to be a lack of trainers who had an understanding of the early childhood curriculum. It appeared most reps had only had experience with primary and secondary schools. The barriers to appropriate professional development are discussed further in Chapter 9.

5.9 Chapter summary

In this Chapter I argued that the way the IWB was used by the children reflected the teachers' visual art pedagogy and six key themes that emerged from the data were critically discussed. The themes demonstrated that:

- The IWB was freely available throughout the session so children used it when they felt like it.
- Children were given an unlimited amount of time to use the IWB so they were able to fully develop their ideas and practise technical skills.
- The IWB sometimes motivated children to replicate their ideas using other types of art media, such as paint or collage, and this was encouraged by the teachers. Furthermore, the IWB could also be used to encourage children to recreate their knowledge, interests and ideas developed in other domains onto the IWB.
- The large size of the IWB motivated the children to do big drawings which were not possible using the traditional materials provided.
- The technical complexity of the IWB also fostered teachers' engagement with children's visual art learning experiences more directly, as they scaffolded children's technical skills while also engaging in discussion of the work in progress.

The study identified that while all the teachers used the IWB with children the level of the teachers' skills and experience varied. This was due to the amount of professional development and training teachers had received as well as the time

available to practise skills. Not having enough time was identified as a barrier to skill development.

In the next chapter themes that emerged from participant observations of the children's and teachers' use of the IWB for visual art learning experiences will be discussed.

CHAPTER 6

Children's and Teachers' Use of the IWB for Visual Art Learning Experiences

6.1 Introduction

The previous chapter outlined the teachers' visual art pedagogy and the implications of this on their own and children's use of the IWB for visual art learning experiences. This chapter focuses on the findings from the participant observations at the case study kindergarten which were done from 9.30 a.m. to 12.30 p.m. over four consecutive weeks. Children's and teachers' use of the IWB for visual art learning experiences were observed to help answer the research questions that related to the teaching strategies used to assist children's learning, as well as the learning strategies children used to develop their skills with the IWB.

Four key themes were identified from the field notes, photographs, and video recordings made from the observations. These were:

1) The impact of the location of the IWB on the children's and teachers' use of the technology for visual art learning experiences
2) The affordances of the ACTIVprimary software and the types of visual art learning experiences this fosters
3) Collaborative and peer support in visual art learning experiences using the IWB: Tuakana/teina relationships
4) Drawing and story telling with the IWB.

I critically discuss these four themes in depth. Teachers' thoughts and ideas from the focus group interview are discussed in relation to the themes and, where relevant, information from the analysis of teachers' Learning Stories has also been included.

6.2 The location of the IWB in the kindergarten

The location of the IWB in relation to the art area, space around it, access to it, and the public nature of its position were all important. Each of these aspects is discussed in the following sections.

The art area

The kindergarten's visual art area at the time of this study was situated in the middle of the large L-shaped main room of the kindergarten building. Children had free access to traditional art materials such as paper, pens, staplers, glue and college materials. They were able to work on two low tables and a silk screen bench set aside specifically for art-making. Next to these tables, but near a window, were two conventional painting easels. This area remained permanent throughout the period of the study although the positioning of some art-making materials was fluid. For example, materials such as drawing and painting materials were often available in the outside area on the verandah in order to provide for children who preferred to play outside.

The IWB, however, was not situated in the designated visual art area but placed around the corner of the L-shaped main room and mounted on the wall. This space was used for mat-time and/or group sessions (see image 16), and was situated next to the puzzles, blocks, a science area, and a book area. Like traditional art materials, which were always available, the IWB was always turned on[6] and freely available to the children throughout the session. During the observation period I noticed that there were a few times when the IWB was left unused because children were engaged in other activities elsewhere in the centre.

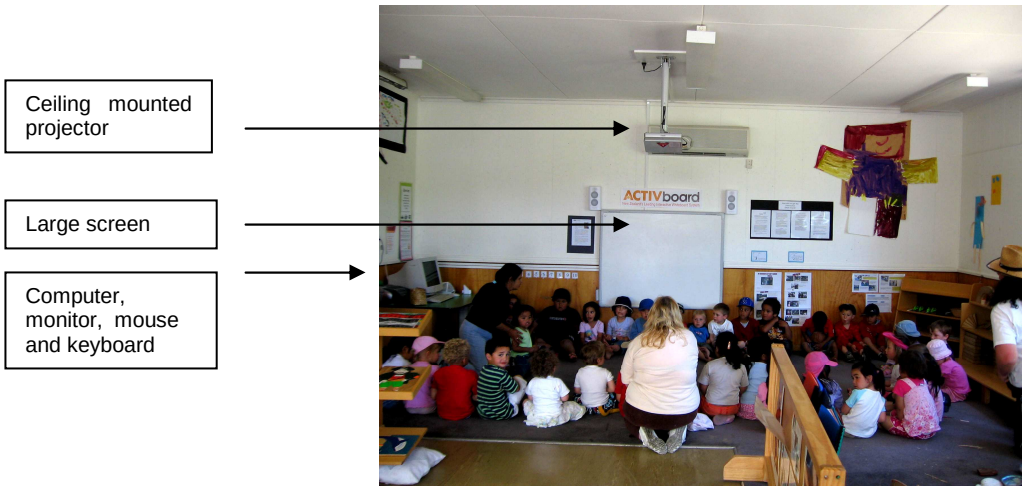


Image 16: Children and teachers gather for mat-time in front of IWB

[6] Unless there was a computer problem or teachers needed their mat-time space to focus on other things.

Space

Space was another important factor concerning the use of the IWB. There was plenty of space around the IWB and this allowed the children easy access to it. The computer that drove the IWB (with a small screen, keyboard and traditional mouse) was positioned near the IWB but did not affect children's access to the board (see image 1, p.9). Other activities sometimes encroached on the space in front of the IWB, for example, block constructions. Generally though, the children accommodated this and were able to work on the IWB unhindered. On the occasion that I observed the teachers had put a table with traditional drawing materials near the IWB, there was enough space to accommodate this new activity.

Having the space to move freely around the IWB appeared to be something that the children enjoyed. During the course of my observations I noticed that children would often work on the IWB and then move back into the carpeted space to view their work on the big screen from a distance, or walk over to the small computer screen to look at their work. By way of illustration, Keanu (aged 4 years, 7 months), a very physically active child who was a daily user of the IWB, would often leave the board and do a small twirl or dance in front of the IWB and then move back to the IWB to continue his drawing. The space in front of the IWB also enabled children to sometimes use chairs to sit on while they did their work, and often their friends and teachers would bring chairs and sit with them (see image 17).

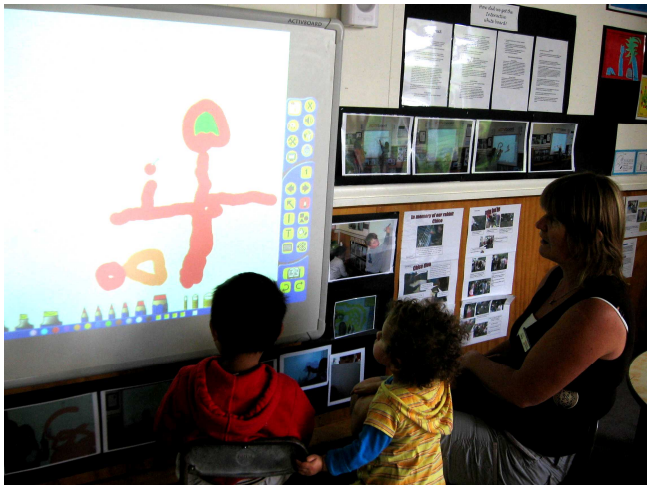


Image 17: Two children (one seated) and a teacher (seated) discussing a child's drawing on the IWB

This option appeared to encourage interactions amongst the children, creating opportunities for socially constructed learning. This provided me with evidence to help answer my research question about the types of socially constructed learning

that occurred for both the teachers and the children using the Interactive Whiteboard for visual art learning experiences.

Access

In order to provide fair access to the IWB the kindergarten teachers had instigated a system of name tags. As children arrived at the kindergarten in the morning they were encouraged to find their name tags, which were located on a wall near the front entrance and next to a photograph of themselves. When children wanted a turn on the IWB they would get their name tag from the table and take it to the IWB and hang it on a numbered hook (see image 1, page 9). As already stated, no time limits were imposed on the children's use of the IWB. They needed to remove their name tag once they had finished so that the next child could have a turn. Overall, the system worked quite well but the teachers did say that they sometimes needed to remind children about the access process and reinforce the system when they observed it was not working properly.

A public activity

The IWB, being large and centrally placed, made using it a very public activity. Children who were not directly using the IWB often stood and watched what was happening, or observed while they were doing something else, for instance playing with the puzzles nearby. Arana (aged 4 years, 2 months), who had just started at the kindergarten and had no previous experience of an IWB, surprised the teachers and myself with her level of competency and confidence when she started exploring the IWB. My notes describe the following observation of Arana.

> Arana is very keen to have a turn. Arana is so new to the kindergarten she doesn't have her name tag yet so I make her one to put on the hooks. She is in line to have a turn after Vahini and watches with interest as Vahini manipulates the animals. She has been interesting to observe as she is the newest user of the Board and she seems to have picked up so much from watching the other children using the technology, and then having a go herself. I show her how to put the animals into the bin successfully by noticing how the bin opens when the animal is put into it. I observe her practising this skill after I move away from the Board. (26/11/07)

It appeared that the public nature of the IWB enabled her to easily observe her peers and then imitate their behaviour when it was her turn. As Williamson and Meltzoff (2008) suggest, "children are remarkably adept at imitating. Not only do they copy the overall goal or outcome of a demonstration, they can also imitate the precise means a model uses to attain that goal" (p. 275).

Children seemed to accommodate the public nature of working on the IWB very well. Nonetheless, I did observe that one child when asked by a teacher if she used the IWB, replied, “I don’t like people watching me on the Active Board!” As traditional drawing and art activities were amply provided at the kindergarten children who did not want to use the IWB still had plenty of opportunities to engage with visual art learning experiences that were not so public.

6.3 The affordances of the ACTIVprimary software and the types of visual art learning experiences this fosters

A second key theme was the affordances of the ACTIVprimary software on the IWB and the visual art learning experiences this fostered. Children used the IWB for visual art learning experiences which were primarily drawing-based. The digital affordances of the IWB and the ACTIVprimary software offered children some new experiences in this area and these were significantly different to those offered by traditional drawing materials. In this section I will discuss the tools in the ACTIVprimary software such as: the pens, pencils and highlighters, the digital eraser/rubber tool, the image library, the rubbish bin, the fill tool (see image 18), the role of the computer monitor, and other aesthetic experiences.

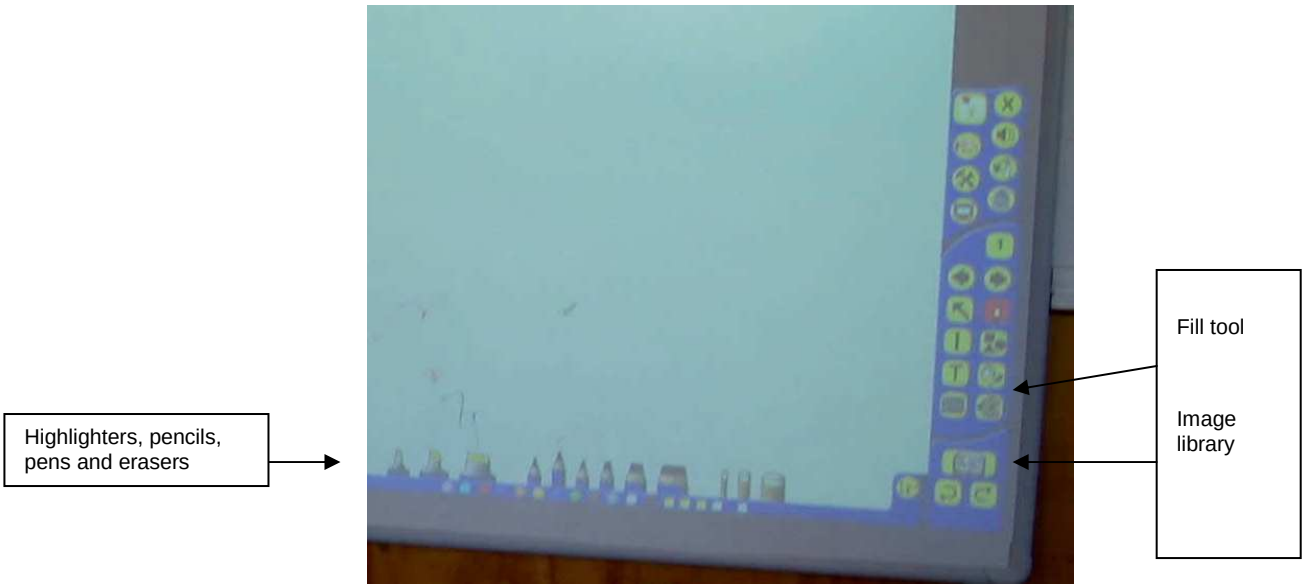


Image 18: The software drawing tools in ACTIVprimary are located on the bottom of the flipchart page

The pens, pencils and highlighters

The children manipulated the ACTIVprimary drawing software using a digital pen, hardware that functions in the same way as a computer mouse. However, in the ACTIVprimary package, the software’s pens, pencils and highlighters that children used for their drawings (which were activated using the mouse pen) were

represented by icons that were pictures of standard felt pens, pencils and highlighters. Children could choose three different thicknesses of pen, pencil and highlighter by selecting from a range of icons displayed at the bottom of the flip chart (see image 18). They could then choose the colour to be used with the pen by selecting from a standard range of colours also located at the bottom of the flip chart underneath the pens, pencils and highlighters.

Interestingly, the children often used the thicker pens in their work, possibly because many of them seemed to enjoy the ease with which they could cover the surface of the IWB with colour in an abstract way. Nonetheless, some children were more discerning in their use of pen width, particularly if they were doing more detailed work (see image19).

Image 19: A thin pen was chosen by Jasmine (a focus child aged 4 years, 2 months) to draw a detailed portrait of the researcher

When colours were mixed, generally through overlaying, new colours were created that were technically correct. In an observation of Alex (see image 20) I specifically observed his use of the pens:

> When I begin to talk to Alex he is working on the board using the 'fill' icon and systematically working through the colours on the menu to change the colour of the board's total work surface. We begin a conversation about the colours. He asks me which is my favourite and I answer that it is blue. He says he likes all the colours!
>
> He makes the page white and draws a yellow circle. I ask him if he can make the centre of the circle a different colour, wondering if that will prompt him to use the 'fill' option to colour the centre of the circle. Instead he chooses to create layers of colours within the circle using the large pen. As he does this he begins to cover the previous lines with new colours and I notice that when this happens a new colour is made where two are layered e.g., yellow over blue makes green.
>
> Alex starts a new page and begins to draw me a lollipop. I am curious if any of the other colours will affect others they intersect with. He uses a light green to create the central shape of the lollipop. He then covers some of it over in grey which makes the green a darker shade. (19/11/2007)

Image 20: Alex drawing in grey over his green lollipop and in the process creates a darker shade of green

In this observation I also included a personal reflection on this occurrence which demonstrated my own learning about the affordances of the programme and how they made me modify some of my presumptions and possible prejudice about the software.

> I didn't know that this could happen which makes me change my ideas about some of the possible limitations of the programme re colour mixing. (19/11/2007)

Digital eraser/rubber tool

The eraser/rubber tool was one of the digital tools (in the ACTIVprimary software) that the children explored extensively. They were frequently observed using the digital pen to create a drawing and then using the digital eraser tool to remove it. This affordance seemed to give the children immense satisfaction and they would often spend considerable time and effort removing every single bit of their drawing from the IWB. This appeared to be the digital equivalent of children doing a complex and detailed painting and then covering over the image entirely with paint, something that often dismays adults but which satisfies children. In the focus group interview Tanya, for example, commented she had experienced this and described her own response:

> …it's like [I'm thinking] "God that's a good picture!" and then they go and rub it out! (26/11/2007)

For some children using the digital eraser/rubber tool meant that they could adjust their drawings if they felt something needed altering or improving. Karin (a focus child, aged 4 years, 8 months) had very definite ideas about what she wanted in her drawings and used the IWB drawing tools for quite complex work. She also used the eraser/rubber tool in this way. The adjustments to her mistakes enabled her to continue working on the image without having to start over again as she would need to do using traditional felt pens.

In the Learning Story *Rochelle's flowers* Kuini notices how important this feature seems to be for Rochelle's drawing process. In the focus group interview Kuini said she felt that the erasing capability of the software was good for children like Rochelle and Karin (discussed above) who were perfectionists in their drawing. She wondered, though, whether this could be creating a problem for some children as any mistakes in drawing could be remedied so quickly on the IWB using the eraser or undo tools, but this was not possible on paper.

> I think it's good too for perfectionists but I don't know if we are creating more with the Board or would they be a perfectionist in other ways? Like, Alex is becoming a perfectionist when he draws anywhere now. Here [on the Active Board] it can be remedied with a swipe and a tick, but on an actual paper … [teacher mimes throwing it away and turning it over in disgust]. (26/11/2007)

The digital eraser/rubber tool, which had the option to be used in three different widths, could also be used as a drawing tool. The children were observed using it to inscribe into an existing image or block of colour; the negative space becoming a white line or shape (see image 21). Kathy remarked on this affordance in the focus group interview, stating:

> Sometimes they are rubbing up and down like that and sometimes they make a pattern as well…so they get another visual thing from it like "Look what this rubber is doing!" (26/11/2007)

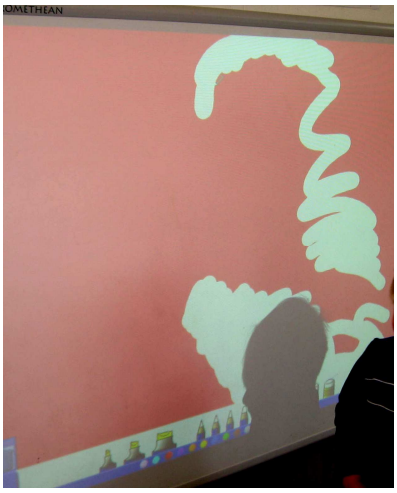


Image 21: Using the digital eraser/rubber tool to create negative spaces which appear as lines or shapes

Image library

The image library provided another affordance that gave children new opportunities for exploration in their drawing. A range of images was available in the ACTIVprimary software that could be inserted into children's flipcharts and be drawn on, or around, or used as models for their own drawings. Children would sometimes employ the images as backgrounds to their drawings, or use the images for creating

increasingly complex collages combining their own drawings and the software images. The animal images were particularly popular for this purpose as they could be manipulated and moved around the IWB with the pen.

Michelle, a toddler (aged 2 years, 0 months), found this option very engaging, often providing a running commentary about her discoveries and drawings with the animal images. A piece of video capturing Michelle working on the IWB with animal images from the library (see image 22) recorded how she talked to herself as she worked covering a camel in purple and yellow. She said:

> He's gone! He's gone! He's in the building!"…"Oops dropped the pen"…"He's hiding! Hiding!" …"He's gone! (22/11/2007)

She then changed the colour on the pen and started self-talking again in a similar manner saying:

> I want the yellow"… "Look the yellow!" … "Yellow"… "Elephant!"

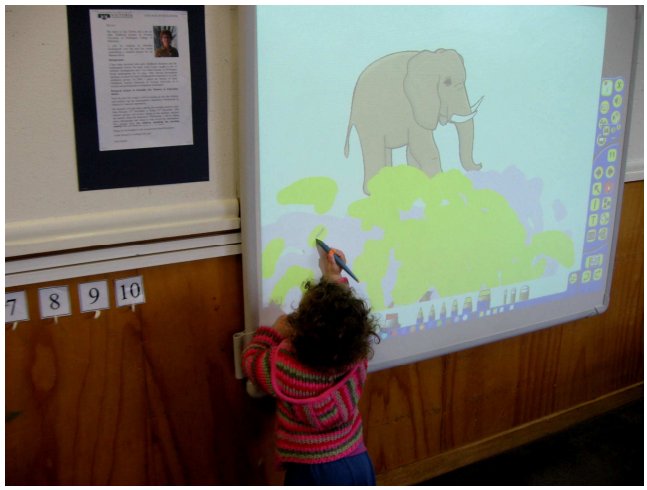


Image 22: Michelle covers a camel in purple and yellow but can't quite reach the elephant

During the focus group interview Kuini and Kathy, who were most experienced with the IWB and the ACTIVprimary software, demonstrated they had a lot of knowledge about the image library. They described how the images could be used for discussions with children as well as being available for them to use in their art work. Kuini and Kathy outlined the magnifying glass tool that could be used to create a cover over an image that has a small circle through which parts of the image can be seen. Whilst they did not say they had actually used it in their own teaching, they felt that this had potential for assisting children's prediction and problem solving skills in relation to determining what an image might be. Furthermore, Kuini and Kathy saw this feature as having benefits for helping children attend to the aesthetic details of

objects such as design elements, shapes and shadowing. They discussed how teaching resources could be made on the IWB, such as documents and flip charts. Kathy, for instance, had recently been to Australia and taken lots of photos of sharks and fish that she wanted to add to the image library. Although the teachers did not give examples of resources that had been specifically made to foster visual art learning experiences, they recognised the potential was there to do so.

The rubbish bin

Children were able to dispose of unwanted images by dragging them with the pen into a rubbish bin. By moving the image to the rubbish bin icon, the images appeared to be gobbled up by the rubbish bin (see image 23). The ability to do this required quite a lot of dexterity with the pen to move the images, and was sometimes too challenging even for some of the older children. Nonetheless, Michelle (2 years, 0 months) had these skills and particularly enjoyed the affordance as it meant she could rearrange her images in a multitude of different ways (see image 24).

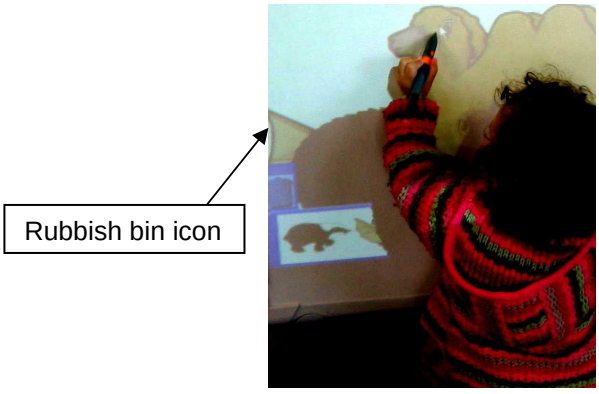


Image 23: Michelle dragging a camel to the bin

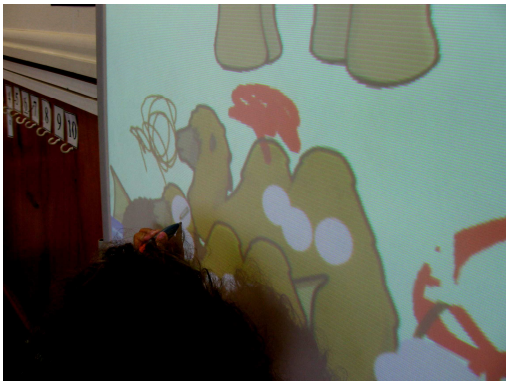


Image 24: Michelle rearranging images

Moving parts

A further affordance of the ACTIVprimary drawing software involved the ability for 'parts' of the children's own drawings to be moved around the IWB. This was a fairly complex skill. Only the more experienced users, for example, children who had learnt how to effectively manipulate the tools and had frequent opportunities to practise these skills, were able to perform this function effectively. The separate 'parts' of children's drawings were also able to be deleted by putting them into the rubbish bin (see image 25).

I did not observe this affordance being used frequently. However, in a conversation with Kuini, during a morning session, she reported that she had seen children using this and noticed how they had created their own game where they took their own drawings apart and then put them back together again the same way.

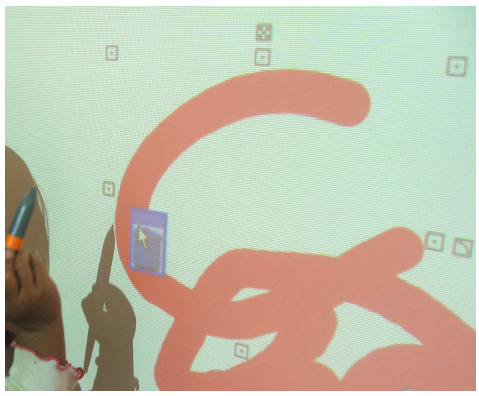


Image 25: Part of a drawing (indicated by the small squares that surround it) being dragged to the bin

The 'fill' tool

There was also a fill tool which enabled children's drawn shapes and/or images from the library to be coloured in digitally. Occasionally this resulted in some very psychedelic explorations, especially if the children were working fast. By tapping on the 'fill' icon (a paintpot symbol), and then choosing a colour from the menu this tool could also be used to change the white background of children's drawings to a colour of their choosing (see images 26-28). This affordance required a more sophisticated knowledge of tools and throughout the observation period it was mainly done by more experienced children.

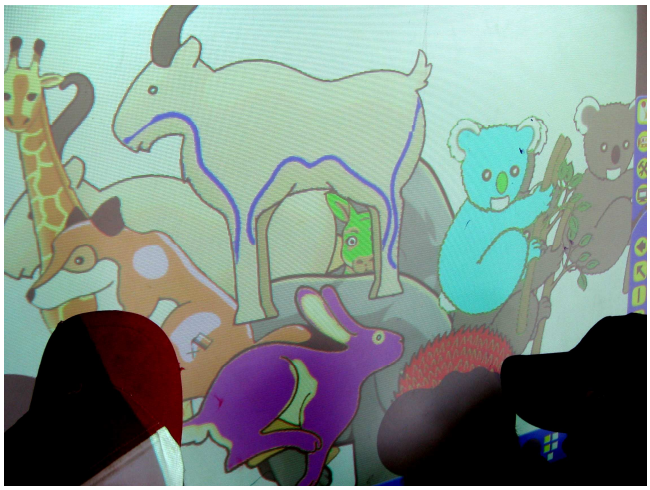


Image 26: Henry (aged 4 years, 8 months) shows his friends how he can change the colour of the animals using the 'fill' tool

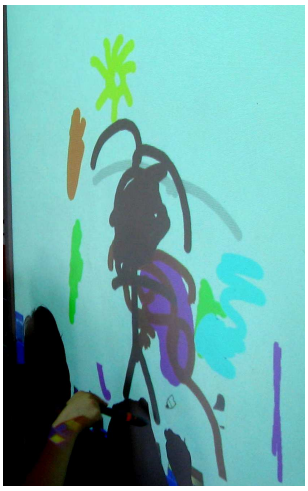


Image 27 and 28: Karin (4 years, 8 months) changes the background colour of her drawing using the 'fill' tool

Computer monitor

As mentioned earlier, the small computer screen was set up next to the computer that operated the IWB. This was used frequently by the children as they progressed with their drawings on the IWB (see images 29 and 30). The children would often move from the image on the big screen to look at it on the small screen. As the children were small I felt this enabled them to see their whole drawing more clearly and, because of the amount of lighting in the kindergarten building falling on the IWB, the colours on the smaller screen were much brighter and more intense than on the big screen.

Images 29 and 30: Seb (aged 3 years, 9 months) checks his drawing on the small monitor after working on the IWB

This also allowed for more participation by the children who happened to be observing as they could see progress on both the big and small screens. Watching a drawing progress on the small screen was quite intriguing and had a magical dimension due to the drawing appearing to be creating itself or being made by some invisible hand.

This behaviour was commented on by Martha at the focus group interview who felt that the dual screen function seemed to fascinate the children. The teachers wondered if the second screen also contributed to the children's learning about using the technology as well as how to use the drawing tools in the software. They had observed that the dual screen appeared to encourage debate and discussion among the children. Martha stated:

> … you've got some watching that monitor and some here [in front of the board] and there is great debates that go between the two of them. (26/11/2007)

The second computer screen provided children with two different perspectives on the same drawing. Importantly, it created opportunities for other children to debate and study the drawing process as another child used the IWB, fostering opportunities for socially constructed learning.

Other aesthetic experiences

Children enjoyed playing with the effects created by the data projector used with the IWB. Sometimes this involved shadow play, other times this was playing with the light being projected onto the screen and onto their bodies. These experiences, whilst not specifically related to drawing, played a role in the children's exploration of some of aesthetic experiences that happened with the IWB. In one of my observations I saw Kasha (3 years, 3 months) and Karin (4 years, 8 months) playing with the light as they worked on a drawing:

> There is a moment when the girls explore the projection on the board. Kasha (3 years, 3 months) has a large egg carton and holds it in front of the screen and the light falls on it. Karin explores whether she can operate the Board on the projection. She puts her head in front of the light to create a shadow on the egg box and they play with the light. There is a very curious moment when the projection of one of the pens falls on Kasha's forehead. (12/12/2007)

As already pointed out, the literature on the use of IWBs and the affordance of using digital art-making tools for young children's visual art learning experiences is limited (see Chapter 2). Nonetheless, Loveless (2007) believes that ICTs can support creative practices in a range of domains, such as the visual art. She points out that some practices are changed by an ICT environment such as the digital affordances offered by an IWB. The software the children were using in this study with the IWB enabled them to change aspects of traditional drawing practice by utilising the digital affordances of this software, adding a new creative dimension to this process.

Loveless (2007) maintains that we need to "continue to revisit our understandings of creativity" (p.14) and, I would argue, consider how this may impact on young

children's visual art learning. I agree with Loveless when she suggests that this re-thinking of creativity will emerge as we, and particularly teachers, begin to "think at the edges of our practice, and figure out how to use the tools and media in distinctive ways to express our imagination and capabilities" (p.14). The children in this study were able to do this, and as their knowledge and expertise grew, so too did the complexity of their creative explorations.

Long (2001) notes that digital technologies are playing an increasing role in visual art education in the 21st century and suggests that ICTs, such as computers, can provide important "connections in the curriculum to the design industries, to graphics and to popular forms such as gaming and movies – all of which involve digital manipulation" (p. 214). The IWB's software and digital tools, although not sophisticated, did offer the children in my study new possibilities for digitally manipulating their drawings and images, creating in some instances, new types of pictures and images.

6.4 Collaborative and peer support in visual art learning experiences using the IWB; Tuakana/teina

Another key theme was the way the IWB supported socially constructed learning between the children. The IWB offered children the opportunity to work together and, in the process, discuss each other's drawings and give each other support with using the IWB tools. It was not unusual to see children creating a drawing or design with their friends sitting beside them on the little chairs, engaged in lively conversation with the artist and/or each other. Children who were not actually physically participating in the work were 'active observers'. They did not sit passively watching; they were often actively engaged through dialogue, critique, and/or by offering technical support.

By way of illustration, Karin (a focus child, aged 4 years, 8 months) encouraged her friends Joan (aged 4 years 9 months) and Kasha (4 years 3 months) to stay with her as she drew on the IWB. Kasha sat next to her, while Joan sat at the computer monitor and watched the drawing in progress from this slightly removed vantage point (see image 31). This participation was obviously important to Karin because at one point in the drawing process she called to Joan to watch, on the monitor, what she was drawing on the IWB. Throughout the process the children talked to each other. Suggestions were made by Kasha, but many of these were ignored by Karin. Her friends watched carefully, taking in what the artist-child was doing and generally there was a feeling of collaboration and participation in the visual art learning experience taking place.

Image 31: Karin's friends participate in her drawing process – one beside her, one at the small computer monitor to the side of the IWB

According to Vygotsky (1978) peer-peer scaffolding is an essential part of children's learning in a social context. This was demonstrated by Karin and her friends working together with the IWB discussed above. Rogoff (1990) recognises that children's observations involve a social and participatory dimension. She states:

> Children's presence in any particular setting is by social arrangement. And children are actively involved in understanding the social world, paying special attention to the actions of people and the activities of value in the culture. Often their observations occur in contexts in which they are preparing to or already participate in on other occasions. (p. 208)

This peer learning relationship is often described in the New Zealand literature as a tuakana/teina relationship (Tangaere, 1996) which is often one "between an older (tuakana) person and a younger (teina) person and is specific to teaching and learning in the Māori context" (Exploring Te Ao Kori Teaching Methods, Tuakana/teina, para. 4). This concept, I believe, is also relevant in an early childhood context, including the case study kindergarten. Within a teaching and learning context tuakana/teina can take a variety of different forms:

- Older to younger – where the tuakana has the knowledge and content knowledge to pass on to the teina (see image 31).

An example of this type of relationship was observed in the scenario with Karin, Joan and Kasha described on the previous page. Karin, one of the oldest children, actively demonstrated her skills and knowledge to her friend Kasha, and at one point explicitly instructed her friend Joan (slightly older) to watch what she was doing.

- Younger to older – the teina has some skills in an area that the tuakana does not and is able to teach these to the tuakana.

Interestingly, I observed that this phenomenon often happened in relation to the children teaching the adults things about the IWB. The newer teachers – Surija, Tanya and Martha – mentioned this happening to them at the focus group interview. I experienced this for myself on a few occasions as the following example illustrates:

> I arrive at kindergarten and Michael (4 years, 6 months) is at the Board – he has his name-tag up and so does Jasmine. He plays with the Board doing a quick flick sketch and then changing to the games section. I fluff around getting my writing gear sorted from the office and settling in a space near the blocks to observe. He says to me "Hey! Look at this!". He has the game menu open and then he slides it across by dragging it from the edge to reveal the drawing page open underneath. I didn't know you could do that! He shows me this again when I ask him to repeat this move somewhat later so he knows how to do this deliberately, it's not a random thing. Another new thing I have learnt from the children. (3/12/2007)

- Peer to peer – teina teaches teina, tuakana teaches tuakana (see image 39).

This was illustrated in an observation of Tom (a focus child, aged 3 years 4 months, Image 32) who was joined by Rose (also a focus child aged 3 years, 4 months):

> During the course of Tom's exploration – which is a long one, Rose becomes more actively involved in his process and he is very accommodating often taking on her suggestions for colour changes and shapes. They sometimes use the monitor to review their progress, hanging off the edge of the desk top discussing the work before going back to work on it some more. (3/12/2007)

Image 32: Rose assists Tom by pointing to a tool needed for the work

- Able to less able – the learner may not be as able in an area, and someone more skilled can teach what is required (Ministry of Education, 2005).

An interesting example of this situation involved Nettie (aged 3 years, 10 months), a child who did not feel confident or comfortable about using the IWB for a drawing, and Joan (aged 4 years, 9 months). The drawing involves a collaborative effort between an able user and the less able user (see Image 33):

> Nettie and I spend some time together watching Michelle work on the Board. Nettie seems to be keen to use the Board and when Michelle is finished I give her the pen. However, she is reluctant to work on the Board and really doesn't want me to watch her so I turn my back for a while. She isn't keen despite my encouragement. She asks me to do a drawing but I am reluctant to draw for her so Joan, who is near by, offers to draw. Nettie says she wants her to draw her mum so Joan obliges and Nettie tells her what she wants on the drawing, describing the features.
>
> Nettie says she also wants a dog and Jenny begins to draw it. They discuss how many legs there should be, Alex who has come for a look joins in. Joan and Alex say there should be 4 legs but Nettie says there should be one. After some hesitation Joan draws the dog with 1 leg but puts a head on the dog. Nettie says that it should have wings like a butterfly! Joan however, draws a butterfly by itself. The work is a joint collaboration with the ideas coming from Nettie but with debate among the other children and some artistic licence from Joan as the drawer. (19/11/2007)

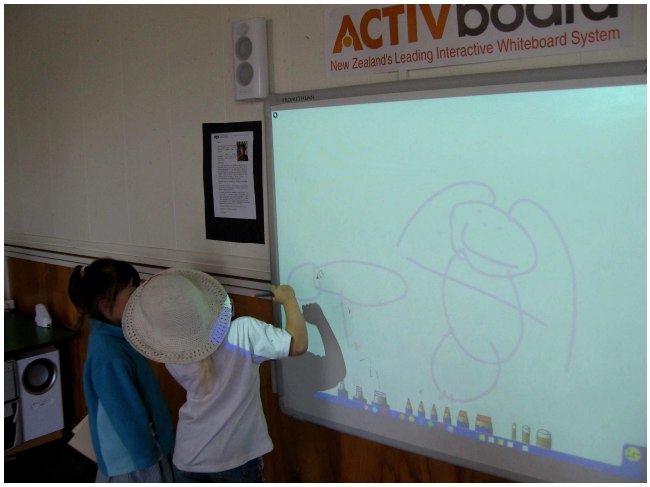


Image 33: Nettie and Joan co-construct a drawing

As illustrated above all these different manifestations of the tuakana/teina relationship were evident in my observations of the children's use of the IWB at the case study kindergarten for their visual art learning experiences. This collaborative type of relationship was poignantly documented in a Learning Story *Tanya takes the Lead* in which Kathy recognised that Tanya, a Down Syndrome child, loved sharing her knowledge of, and skills with, the IWB with other children (see Appendix O) highlighting how sharing knowledge can be very empowering for young children. In the focus group interview the teachers talked about when children are recognised as

having specific skills in certain areas, they become identified by the teachers as 'experts'. Experts have the knowledge and skills to guide other children and were encouraged to do so at the kindergarten.

The Ministry of Education's ICT strategy *Foundation for Discovery* (2005) for the early childhood education sector suggests that the use of ICT, such as an IWB, in early childhood contexts has the potential for "… enhancing relationships (with key adults, peers, siblings, tuakana/ teina)…" (p.17). Several observations in this study confirmed that the children's use of the IWB for visual art learning experiences were collaborative, and involved the sharing of knowledge and skills with each other through tuakana/teina interactions.

6.5 Drawing and story telling on the IWB

A final theme highlighted the importance of the relationship between drawing and story telling on the IWB. Drawings created on the IWB were sometimes used by the children as a vehicle for story telling. Children would often discuss what was happening in their work if I asked them about it but some children were more forthcoming than others. The children's enthusiasm for linking their drawings to a story seemed to be another important way in which the IWB could be used for not only enhancing visual art learning experiences but also literacy experiences.

An observation of Kasha (aged 3 years, 3 months) demonstrates the powerful link between children's art and story telling (see Image 34). She demonstrated great enthusiasm for story telling as her ideas developed on the IWB:

> Suddenly Kasha comes up. I haven't had much to do with her before but she proudly shows me her drawing of a piece of paper in orange felt pen of herself in a Halloween Devil's outfit and describes her picture in detail to me. I ask her if she can draw the picture on the Activeboard as well, so she gives it a go. I coach her a little bit about the pens and how to change colours and then away she goes!
>
> "Shall I do a scribble" she asks. "Hey look it's a horse!" "Shall I draw the legs?" "1 2 3 4 5 6 7!" She is excited about her picture and I ask her about it and record this with the camera. My inquiry seems to spur her into more exploration and soon the drawing becomes quite complex with lots of different images and a storyline that she happily relates as she works … Lollipop Playland, a farm with animals. She sings *Old MacDonald*, draws a bird, other animals and images, and then an interesting creature called a Cloggage which has no legs!
>
> Her art work is interesting and complex and her narrative is rich and imaginative. She is the first child to really engage with story telling and her drawings with me like this. I take several bits of video of her working and sometimes ask her about her work as she goes along. She seems to enjoy having me as the audience and does another drawing on a new page that again begins with a scribble but develops into another imaginary animal with a hat! Again there is a story to tell. Eventually she has had enough and moves away. (3/12/2007)

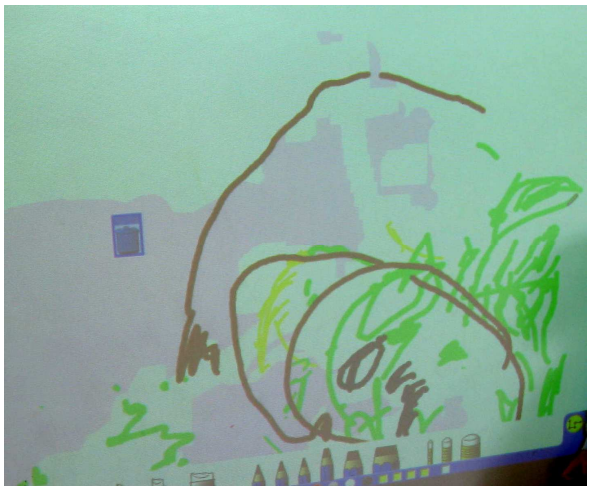


Image 34: Kasha's drawing of a farm and a Cloggage with no legs

In this example of Kasha's drawing on the IWB and the resultant story telling, I took on the role of an "interested adult" (Visser, 2004, p.12) and I was able to encourage her story telling and drawing by not only showing an interest but also enthusiasm and encouragement, which were important elements of this process. In agreement with Wright (2007), Kasha's drawing on the IWB allowed for "the affordances of the medium of drawing, combined with the medium of telling… to enrich and inform the other" (p. 37).

Furthermore, Colbert (2006) has noted that ICT has a powerful ability to extend children's interest in story telling. The children in Colbert's kindergarten, where she undertook her research, used traditional drawings and/or their own digital photos to support their stories which were created using computer programmes such as Word or iMovie and incorporated written text and/or voice recordings. Whilst Colbert did not use an IWB for this work, it is interesting to note that the affordances of the IWB such as the ability to add text to children's drawings as well as the ability to incorporate voice recordings could be harnessed to strengthen the link between children's visual art and their story telling.

6.6 Chapter summary

In this chapter four key themes were discussed. Firstly, the central location of the IWB made it very accessible to the children and teachers, and provided children the opportunity to either work individually on the IWB or in small groups. The central location and the largeness of the IWB also provided children with good visible access so they could quietly observe other children using the IWB for their visual art learning and later imitate the observed behaviours on the IWB. Teachers and children discussing and/or reflecting on visual art learning experiences with the IWB

were generally done as children were using the IWB but saved images could also be discussed. Furthermore, being located in a space used for large group mat-times, the IWB had the potential to be used to reflect on children's visual art learning experiences with the big group of children, and with parents present.

A second theme was that the digital affordances of the IWB provided children with new opportunities for their visual art learning experiences. Tools such as the rubber/eraser tool and the 'fill' tool enabled children to do things that could not be done with traditional media and allowed for greater digital manipulation of the images they created on the IWB. Their images could be digitally changed, moved around, erased, and coloured-in. The affordances enabled children to easily adjust their drawings if they were not satisfied with a result, rather than starting over again.

The third theme highlighted how collaborative tuakana/teina relationships were fostered through the children's visual art learning experiences on the IWB. Older children regularly supported younger children, peers worked together, and younger but more skilled users helped less able users to master techniques. This appeared to be very empowering for many children. Children often taught the teachers new ways of doing things on the IWB.

Finally, I identified that the IWB sometimes motivated and encouraged children's story telling in relation to their drawings, enhancing both visual art and literacy learning experiences. The role of an interested and encouraging adult was important for this to occur. Further, the affordances of the IWB have the potential to extend this opportunity for children by including voice recordings and text.

In the next chapter the results from the analysis of the teachers' narrative assessments, Learning Stories, of children's use of IWB for visual art learning experiences, will be discussed.

CHAPTER 7

Children's Visual Art Learning Experiences with the IWB Described in the Teachers' Assessment Documentation

7.1 Introduction

Chapter 6 examined both children's and teachers' use of the IWB for visual art learning experiences. In this chapter I explore children's visual art learning experiences mainly through my analysis of the teachers' Learning Stories. This was an important aspect of the study as the Learning Stories (see Appendices K-Q) gave insight into the children's use of the IWB prior to and as well as during the period my study was carried out, and provided more rich data to assist with answering my research questions.

The teachers provided me with seven Learning Stories that used both written text and photographic images, and which assessed a range of different children's engagement with the IWB. In this chapter I also explore supporting information from the participant observations and the focus group interviews with teachers and parents. The Learning Stories span a nine month period from March to November 2007. Only two of the children in the Learning Stories, Jasmine and Tanya, were focus group children. Nonetheless, these stories provide important information about the use of the IWB by a range of children. Of particular interest is the use of the IWB by two children with special learning needs and by a two-year-old child.

7.2 Learning Stories

Before exploring the main themes it is important to describe the form of assessment used at the case-study kindergarten. Learning Stories (Carr, 2001) are a form of socio-cultural narrative assessment currently used in many early childhood settings in New Zealand, including the case study kindergarten. *Kei tea o te Pae Assessment for Learning: Early Childhood Exemplars* (Ministry of Education, 2004) describes three dimensions or "progressive filters" (p.60) of narrative assessment. These include:

- Noticing – observing and documenting a specific behaviour that is taking place.
- Recognising – determining and/or theorising about what learning is taking place for the child.

- Responding – affirming the learning and/or suggesting how the learning experience can be taken further, for example by adding complexity to the experience or introducing new areas for exploration.

These formed the basis of the case study kindergarten teachers' Learning Stories.

Learning Stories allow teachers to create a personal dialogue with the child. The intention of this type of narrative assessment is to share information about what learning has occurred for the child, and provides the opportunity for the child's family and the other teachers to reflect on and discuss the learning experiences. The assessments "do not merely describe learning, they also construct and foster it" (Ministry of Education, 2004, p.3) by creating on-going dialogue with children, teachers and families about the learning that has taken place.

The majority of the Learning Stories in this study assessed the children engaged in drawing activities using the ACTIVprimary drawing software used on the kindergarten's IWB. There is one story, however, which describes Brian's engagement with photography and how the IWB had the potential to be used to enrich a reflection process with his photographs (see Appendix N).

The following five themes were identified from an analysis of the Learning Stories:

- Supporting children with special learning needs
- The IWB as another tool for extending children's interest in drawing
- Scaffolding children's visual art learning experiences with the IWB
- Transferability: Practising, planning and recreating visual art learning experiences in a new medium.
- Using the IWB to reflect on visual art learning experiences

This chapter explores these themes in depth.

7.3 Supporting children with special learning needs

The enthusiasm for using an IWB by deaf children has been identified by Carter (2002). She carried out a case study on the use of an IWB with deaf children aged three to eleven years old. Carter observed that:

> Very young children were able to create beautiful pictures, explore living books, learning activities on the internet and much more. The interactive

> whiteboard engaged them, because of its visual appeal and ease of access, long before they were able to use a keyboard or control a mouse with accuracy. (p. 10)

She found, too, an improvement in concentration for some of the children using the IWB stating: "Attention spans were often in excess of what would normally be anticipated. This was of particular note with the very young children and those who are thought to have poor concentration skills" (p.10).

Henry draws on the ACTIVboard (Appendix Q) is one of the first Learning Stories from the case study kindergarten documenting how children with special learning needs used the IWB for visual art learning. The Learning Story reveals the excitement the teachers experienced at how the IWB motivated Henry (aged 4 years, 0 months), a deaf child with limited speech and some learning delays due to his hearing loss, to draw. Kuini observed:

> You choose the size of the line thickness from the tool bar and begin to draw, making very swift movements. I just couldn't believe my eyes. You see Henry, this is the first time I [have] caught you drawing. (Appendix Q)

Henry had not participated in drawing activities at the kindergarten before. The IWB motivated him not only to engage in this activity but also prompted him to tell the teachers about his work on the IWB, using his repertoire of non-verbal gestures to communicate the meaning of some aspects of drawing. His teacher Kuini pondered:

> Henry relied on a lot of gestures today to describe and give meaning to what was happening… it could be that the drawings create a language that he hasn't used before. (Appendix Q)

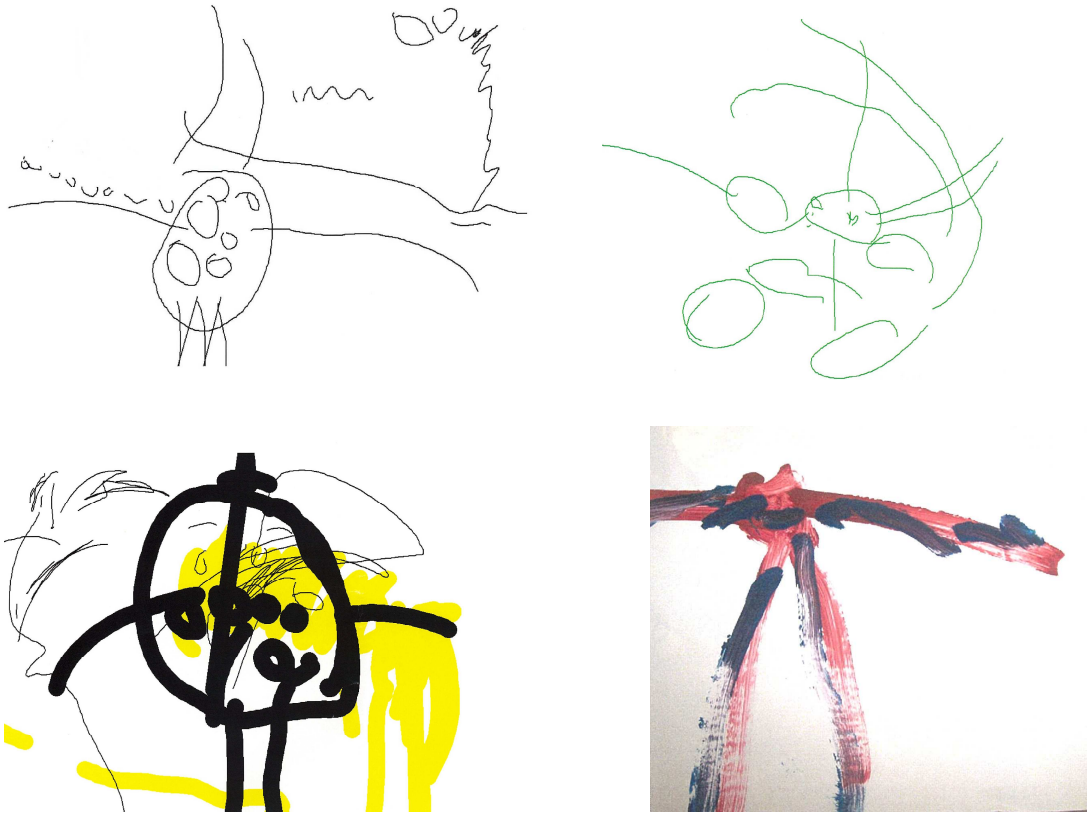
As Henry had not drawn before Kuini speculated about why the IWB could have motivated him. There was the possibility that the position of the IWB, which is away from the busy main area of the kindergarten, and the large size of the board had both contributed to his willingness to engage (see also Chapter 5). Henry is a very big child and often a little clumsy in his movements, and the largeness of the board and the ability to make large drawings may have enabled him to use more gross motor movements, which suited his level of physical development. Kuini states:

> …Using the Activ Board is fast, instant technology… as a learning tool it has given Henry an opportunity to instantly see his images. The Board is fixed to the wall and the size of a dinner table so Henry stands directly in front of it, [and] he has the freedom to create life size figures (and he is beginning to master these) without the restrictions of paper.
>
> …I am wondering if the board gives Henry an instant response, he can see his marks straight away and perhaps as he faces the Activ Board there are less distractions for him so he engages in his work for longer periods of time. (Appendix Q, p.4)

The following day the teachers found that Henry had painted a picture of Spiderman at the painting easel, which was also something that he had never done before. They felt this was significant and probably a result of his explorations on the previous day at the IWB. Kuini recognised that:

> Henry has had a large shift in his artistic images and the provocation for this image comes as a direct result of experimenting on the Activ Board (perhaps?). (Appendix Q)

Images 35-38 demonstrate Henry's increasing drawing skills as he moves from a black and white line drawing to a drawing in green, to a drawing using two colours and a variation of line thickness. These drawings not only show his increasing confidence with the technology but also the visual art learning that has occurred with the IWB. The new knowledge and skills with the IWB resulted in his ability to increasingly add complexity to his images. Henry's Spiderman painting (image 38) illustrates his ability to transfer his new learning and skills into another visual art medium, using new techniques, mixing and layering the paint, as well as using the red and blue colours associated with a Spiderman image.



Images 35-38: Henry's drawings on IWB and Spiderman painting

Implicit in the teacher's Learning Story is the idea that working on the board is a form of scaffolding for Henry's visual art learning experiences with other mediums. His drawings on the IWB extended his interest in drawing as an activity he could engage in successfully, which in turn built his confidence to attempt a painting. During my participant observations of the children I also noted that Henry sometimes took a leadership role on the IWB when he was with his friends (see image 26, p.65) demonstrating to them his high level of skill.

In another Learning Story *Tanya Takes the Lead* (Appendix O) Kathy, documented her observations of Tanya, a Down Syndrome child (aged 3 years, 7 months) engaging collaboratively with another child, Jake, and drawing on the IWB. Having learnt some of the strategies for using the IWB the day before from Kathy, Tanya helps Jake (aged 3 years, 7 months) to use some of the icons by making gestures, tapping and verbal grunting to convey instructions to him.

> Tanya you tap the board when you want Jake to do something – which is a clever strategy (p. 1)…You tap the icon a few times but Jake is not following you but you do not give up. During the next tap you grunt "ahhh" which seems to work as Jake takes the pen across to your finger. (Appendix O)

Tanya had a turn after John finished, exploring drawing shapes with the pens but also investigating the template shapes from the shapes library (see Chapter 6). These intrigued her and she manipulated them into her work. Other children were interested too and came to watch her working.

What was significant for Kathy in this story is not only how the IWB motivated Tanya's drawing and visual art learning but the leadership role she played with other children. Tanya's developing skills and mastery of strategies for using the IWB and her resulting confidence enabled her to become an 'expert', wanting to share her knowledge with other children. The IWB was not only a drawing tool but had also become a vehicle for communication and interaction with other children. The two children's interactions in the story demonstrated that socially constructed learning was occurring through their engagement with each other.

Black (2008), writing on the use of ICT and Down Syndrome children, asserts that IWBs are part of a quiet ICT revolution that is happening (in schools in the United Kingdom) that can make a difference to Down Syndrome children's learning. He states:

> It is hoped that many students with Down syndrome will benefit from the opportunities that interactive white boards give to offer visual clues and key content reminders, as well as accessing the curriculum through the web alongside their class mates… (p. 66)

The Learning Stories about Henry and Tanya, children with two different types of special learning needs, showed that their visual art learning experiences were extended with the IWB. At the focus group interview the teachers said that for Tanya and Henry their ability to communicate with others was enhanced through their drawing processes and explorations on the IWB. The IWB appears to have acted as a mediating tool for both children, enhancing their skills in drawing that enabled them to access an important visual language. As *Te Whāriki* suggests, "language does not consist only of words, sentences and stories: it includes the language of images, art …" (Ministry of Education, 1996, p. 72).

7.4 The IWB as another tool for extending children's interest in drawing

The need for teachers to recognise and engage with children's strengths and interests and to use the resources and equipment in an early childhood setting to foster these interests is an essential dimension of the New Zealand early childhood curriculum (Anning, Cullen & Fleer, 2004; Meade, 1997, cited in Farquhar 2003). Children need to have the opportunity to "develop knowledge and skills in areas that interest them, and to make an increasing number of their own decisions and judgments" (Ministry of Education, 1996, p. 40). The Learning Stories included below demonstrate this.

The Learning Story *Wow What Can I Do?* (Appendix P) describes Jasmine's (aged 4 years, 2 months) passion for drawing and how the IWB was another useful and exciting tool for her to use to follow and extend this interest. Her teacher Kathy writes:

> Jasmine your passion for drawing is unbelievable and the ACTIVboard is just another tool for you to use. (Appendix P)

Kathy also comments on some of the digital affordances offered by the IWB that particularly interest Jasmine:

> One particular icon you enjoy is the rubber as it wipes out everything you don't want…Wow! (Appendix P)

> Okay it is obviously time [for you] to change the page and try something new as I spot you tapping the arrow icon. Isn't it wonderful that at the tap of the pen the page just twirls over to a blank screen. (Appendix P)

As discussed in the previous chapter, when teachers notice a child's interest this can be fostered to motivate the child and used to extend his/her thinking and learning. In this Learning Story Kathy recognised that Jasmine had a strong interest in drawing and that she could be encouraged to use the IWB as another tool for her visual art explorations and learning. Jasmine's mastery of the digital affordances of the IWB software, which are very different from conventional drawing media, for example, the ability to create new 'flipchart' pages for drawing on and the digital rubber tool, encouraged her drawings on the IWB and took her into new creative territory as Kathy describes:

> Once again Jasmine your imagination is boundless as this is the first time I have seen anyone draw around their hands on the ACTIVboard. I admire your resourcefulness Jasmine and I am sure this is what feeds your creativity… (Appendix P)

One of the exciting things about the IWB is the way in which it can stimulate and motivate children to take an interest in drawing. As pointed out in the previous section, in the Learning Story *Henry Draws on the ACTIVboard* (Appendix Q) Kuini notices that Henry's drawings on the IWB stimulate his interest in drawing. The IWB appears to be a trigger for Henry enabling him to achieve a new sense of mastery with drawing which motivates a further interest in visual art learning experiences when he tries out painting. In the story *I Want a Turn* (Appendix L) Marko, who attended kindergarten in the afternoon, is extremely keen to have a turn on the IWB after watching the other children. His enthusiasm and interest in the drawing process are palpable as demonstrated by what Kathy wrote:

> Marko after watching other children drawing on the Activ board, you are adamant about having a turn. So I suggest you hang up your name under the numbers… you eagerly take the pen ... and tap on a colour. Marko you smile when your picture finally appears, as it's like magic. After drawing one squiggly line, you try another, then another. (Appendix L)

Nonetheless, in *Wow What Can I Do?* and in *Henry Draws on the ACTIVboard* the teachers make the point that while the IWB is a useful tool to extend children's interest in drawing, traditional art tools such as felt pens and other drawing equipment, paints and paper still have an extremely valuable place in the art programme. By way of illustration, Kathy states:

> I am excited Jasmine to see where you take your art work with this new tool. But I am still mindful that you enjoy drawing at the table and at times on the clipboard … this is a portable item that can be taken outside. So it is still important to make these options open to you as you become masterful over the ACTIVboard. (Appendix P)

While in the Learning Story Henry *Draws on the Activ Board,* Kuini points out:

> …the Activ Board is not designed to replace the value and experience of painting with real paint, paper and brushes (Appendix 3, p. 4)…it is a tool for provocation, a tool to test ideas and for thinking, and [to create opportunities for children] to manipulate technology to make it do what they want it to do. (Appendix Q)

The IWB is a technological tool that can extend children's interests in drawing, as well as create an interest in this domain. Kathy and Kuini both recognised this but they made it clear that the IWB is a tool which complements the provision of traditional drawing materials rather than replacing them.

7.5 Scaffolding children's visual art learning experiences with the IWB

Five of the Learning Stories clearly demonstrate how the teachers scaffolded children's learning with the technology to ensure they effectively use the digital features of the IWB to create their drawings. For instance, in *Michelle's Drawing* (Appendix M) Surija highlights this aspect of teacher practice:

> …You drew another red circle…I heard you say "yellow" to yourself. One more tap on the thick red pencil and you were ready to draw. "Oh no!" you said. "Did you not like the red?" I ask. "I want yellow" you replied. I showed you the little circles of different colours at the bottom of the screen. "Tap the yellow one Michelle" I said. I looked away for minute and I heard this excited voice "Look, look Sarah!" "Oh you did it! You got yellow" I replied. I brought to your notice that the pencils change colour when you tap the colour you want. (Appendix M)

Surija entered into dialogue with Michelle (aged 2 years, 0 months) about her drawing and she actively showed her where the tools were on the IWB. Surija told Michelle how she could manipulate them so she could create her drawing the way she wants it. She encouraged and praised Michelle when she successfully manipulated the tools by herself.

This was also evident in the Learning Story *Wow What Can I Do?* (Appendix P). Kathy's descriptions of Jasmine drawing on the IWB are framed primarily from a supportive observer view-point but there are moments when she actively intervenes. Kathy shows Jasmine how to use a new tool, for instance the paint 'fill' tool, when she feels the time is appropriate to increase her repertoire of skills.

Scaffolding by the teachers of the complicated procedure of saving children's images in the flipcharts was one often highlighted in the Learning Stories. The sequence for doing this is fairly complex for young children as it requires them to select the appropriate icon, write their name in the 'save' menu item and then click

on the ‘save’ icon (see also Chapter 6). Teachers, therefore, often spent time working with children showing them the icons, modelling the steps, and then reinforcing and scaffolding their attempts. For example, in *Rachel’s Flowers*, Kuini says to Rachel:

> You quickly saved your work. We did the first save together and then you continued to work through the saving sequence yourself. It is a 4 step sequence. “I want to show mum when she comes back.” [you said] (Appendix K)

This also occurred in *Henry Draws on the Activ Board* where Kuini explained explicitly how she scaffolded Henry with the saving process:

> I quickly showed you how to save your work Henry, each time you added another line or circle [I said] “Quick Henry, let’s save your picture”. After several saves (with me leading you to the right icons) you were then able to independently save your own work, following the steps from memory. (Appendix Q)

Once children had mastered the skill they were then encouraged by the teachers to help their peers with the same task. Kuini acknowledged this with Michelle in *Rachel’s Flowers*:

> Michelle has fast become an expert and I often ask her if she would like to show others how to save their work and she quietly shows them the process. Thanks Michelle! (Appendix K)

For children to use the IWB successfully for their visual art learning experiences teacher scaffolding was a very important element in their learning process. As Loveless (2007, p. 9) suggests “free play with digital technologies … does not guarantee effective or creative engagement or development, and there is still a need to support and guide children’s interactions in informed ways.” The complexity of the IWB technology means that scaffolding also needs to be on-going until mastery is demonstrated regularly by children. At this point competent and confident children played a role in scaffolding their less competent peers.

Two of the Learning Stories (Appendices M and Q) demonstrate that when children are drawing on the IWB teachers sometimes engage with the children in relation to their actual drawing processes by asking questions, encouraging their drawing attempts and even making suggestions. In the Learning Story *Henry Draws on the Activ Board* Kuini comments on Nancy’s interactions with Henry:

> Nancy asked “Is that your cape Henry?” as you drew. Again you used your hands to describe what you had drawn. “Where is your hat Henry? Can you draw your hat?” Henry responded by drawing a solid black line down the centre of the self portrait. (Appendix Q)

Surija, too, documented how she talked to Michelle about her drawing in the learning Story *Michelle's Drawing*:

> Michelle you used so many different colours in your picture. Red, yellow, green, orange, black … I could see a beautiful piece of art emerging. "Hi Michelle", I said "this looks like a beautiful green butterfly." (Appendix M)

As these examples illustrate, children using the IWB for drawing can create important opportunities for teachers to actively engage with young children as they draw, entering into dialogue with them in relation to their ideas and actively encouraging their work. This type of engagement by teachers has been shown to be important for enhancing young children's visual art learning experiences (Gunn, 2000; Kindler, 1995) with both traditional mediums and digital ones.

7.6 Transferability: Practising, planning and recreating visual art learning experiences in a new medium

In Chapter 5 I explained transferability in relation to themes emerging from my participant observations. Here I explore this in more depth using two Learning Stories, *Rachel's Flowers* (Appendix K) and *Henry Draws on the Activ Board* (Appendix Q).

Rachel's Flowers, for example, describes her visual art learning experience on the IWB, drawing a flower. The teacher, Kuini, describes how Rachel (aged 4 years, 10 months) had been practising her technique over a few days. Rachel was very precise with her drawing and effectively used the tools to help her get the results she wanted. The digital eraser/rubber tool allowed her to correct her work in ways she could not do on paper. Kuini observes:

> This is your second attempt at drawing. The first attempt didn't satisfy you at all. It was the stem. It wasn't the length you wanted it to be – you had run out of space on the Activ Board (p.1)… "That's not right" you say under your breath. You quickly remedy the filled-in background by tapping the 'undo' option… When you draw with the pen I see you prefer the rubbing out option. Maybe you feel this gives you more control. (Appendix K)

After leaving the IWB, Rachel and Kuini went into the garden to pick puha for the animals and discussed flowers and plants in the garden. Somewhat later Kuini noticed Rachel at the collage table making a collage of a flower. She appeared to have used ideas from her drawing of the flower on the IWB as the basis for the new work. Kuini remarks:

> …I couldn't believe it Rachel You are recreating a flower that resembles the one you drew on the ACTIVboard earlier. I haven't seen you make petals this way before…

> I like the way you discovered that the ACTIVboard can be used to test and try out what you are thinking. What was equally exciting was that you went on to make a flower at the craft table, recreating the colourful petals from the [drawing on the] ACTIVboard with your card and cellophane. (Appendix K)

As discussed previously, the Learning Story *Henry Draws on the ACTIVboard* (Appendix Q) described Henry transferring his ideas from the IWB to a new medium (painting) after experiencing success on the IWB. Whilst Henry's accomplishment is a huge milestone in his learning, Rachel, a more expert user of the IWB, appears to have started to use the IWB more systematically to practise her drawing techniques. The ideas in her drawings inform her new work as she recreates the flower in collage materials.

Loveless (2005) maintains that ICT has the potential to encourage creative activities and thinking, enabling children to develop ideas and make connections. She also believes that new technologies can assist with "creating and making, collaboration, communication and evaluation" (p.6). The two Learning Stories discussed here seem to indicate that increased competency with IWB technology appears to enhance the complexity of children's use of the technology as a tool for their thinking, assisting them to transfer their ideas to, and make new connections with, other types of art media.

7.7 Using the IWB to reflect on visual art learning experiences

The ability of young children to reflect on their activities, creative processes and experiences with others can enhance their learning (Ministry of Education, 2004). Reflection generally involves feedback, for example "information provided by an agent (e.g. teacher, peer, book, parent, self, experience) regarding an aspect of one's performance or understanding" (Hattie & Timperley, 2007, p. 81). This is particularly relevant in visual art learning as it helps children to use their art work and/or associated documentation to make their thinking, ideas and learning 'visible' (Gardner, 2001; Rinaldi, 2001; Ministry of Education, 2004).

Wright (2007) argues that young children's "meaning-making in art can be either verbal or non-verbal, or both, because it involves a wide range of representational texts that can be communicated in diverse ways" (p.37). Allowing children the opportunity to revisit and reflect on their visual art-making gives them the opportunity to share their understandings and interpretations of the world with others. This can happen through a reflection process where children either talk about their work and/or let teachers and others engage with the visual symbols they have depicted.

In agreement with Rinaldi (2001), “understanding and awareness are generated through sharing and dialogue” (p 81). Consequently, revisiting and reflecting on children’s visual art learning experiences that have occurred on the IWB created a forum for this type of significant dialogue to take place.

Because children’s work was not printed off as hardcopies (see discussion in Chapter 5) which could be used for reflection, it was important that children’s drawings were saved and stored digitally. Whilst none of the stories made available to me for analysis described a specific scenario of a child returning to his/her saved drawings for reflection or contemplation on the IWB itself, the potential for this purpose is obviously there. Nonetheless, five of the Learning Stories describe some of the technical aspects of using the IWB which the children have either mastered or are in the process of mastering. ‘Saving’ work is a common technical skill that was often included in a story and, as previously mentioned, is a skill which is quite complex as it involves several steps that a child must remember (see description of this process in *Henry Draws on the Activ Board,* Appendix 3).

Importantly for the teachers, the saving of the drawings created on the IWB enabled them to transfer the children’s drawings into Learning Stories for the children’s portfolios. In this format individual and/or shared reflection, comment and analysis can be done by children, parents and teachers. In *I Want a Turn* (Appendix L) the teacher, Kathy, remarks:

> Matt I am excited your picture was saved to the laptop as I can include it in this story for all your whānau to see and because you enjoyed investigating what you can do with the ACTIVboard. (Appendix L)

This is evident too in the Learning Story *Smile You’re on Candid Camera* (Appendix N) which describes Barry’s explorations with the teachers’ digital camera. The story mainly deals with the technical skills Barry has to master to take photographs and how he learnt to compose a shot. However, Martha, his teacher, decides that the IWB could be a way in which she and Barry can look at his photographs, and incorporate opportunities for reflection on the learning for both her and Barry. She remarks:

> I have not seen you use the interactive board very often at kindergarten and Lisa has also confirmed this. She suggested that we could download the photographs of the learning story which I’m quite excited about. I’m sure you will enjoy seeing yourself on the big screen and I would really like to share with you your story, thoughts and ideas about the photographs. (Appendix N)

I saw Kathy incorporating a dimension of reflective practice as she worked with Marko (aged 4 years), a new user of the IWB, as she scaffolded his use of the IWB. I observed:

> Marko, a new user, comes to the Board and is scaffolded into some drawing by Kathy who is delighted by his work. During his session he also decides to use the mouse rather than the pen and she lets him do this. During his exploration Kathy revisits some of his work in the flip chart, he has done 3 pictures, and she discusses these with him. This is the first reflective use of the board re artwork that I have seen so far (12/12/2007).

I noted that children often talked to each other, reflecting on what was happening within the drawing or design process as it took place, by making comments and sometimes assisting each other. This is illustrated in an observation of Tom (aged 3 years, 4 months), Alex (a focus child aged 4 years, 1 month) and Rose (a focus child aged 3 years, 4 months) working together:

> Tom gets the pens and does a sketch in yellow which he isn't satisfied with. He wants the 'numbers' and searches the best he can through the menu but doesn't find what he wants. I ask him to see if any of the other kids know. Alex tries but doesn't find anything but eventually Tom gets the image library open. Alex is watching and thinking about this exploration and suggests that he uses the arrows to find more things, and when the menu comes up he tells Tom to '"click on one of the words". Tom clicks on the rectangles file and opens up lots of red rectangle shapes. Rose turns up and becomes an active observer too. Timmie works though the rectangle shapes arranging them into different patterns…a bit like a block building.
>
> At one point Alex says about Tom's picture "Make it look like a hospital!" and Tom moves some more rectangles onto the page and says "It's a hospital". Tom, like in the last exploration I observed, explores all the colours and creates different patterns on several different pages, and finds new shapes to manipulate in the library.
>
> At one point Alex says to Tom "That's not nice" but Tom says back cheerfully "Yes it is!" (3/12/2007)

Richards (2003) believes that the messages that both teachers and children give about children's art work can influence the way in which children view their own competence in visual art learning experiences. The IWB created many opportunities for children to talk about and discuss their art work with each other as it took place. Visser (2004, p.12) states that the role of an "interested adult" (for example a teacher or parent) is extremely important for encouraging young children's visual art learning experiences, particularly for infants and toddlers. One means of doing this, she points out, is by drawing attention to art works, which could be either the children's own work or those of other artists. In the process of discussing concepts and ideas with children, using arts-related language about the work can extend children's visual literacy. My observations and the Learning Stories demonstrated that IWB can be used effectively to create opportunities for interested teachers,

peers or family members, to reflect on, discuss and encourage children's visual art learning experiences.

7.8 Chapter summary

The Learning Stories revealed that teachers scaffolding children's use of the IWB technology was important for children to be able to successfully use the digital affordances of the tool to enhance their visual art learning experiences. In many of the Learning Stories the teachers and children demonstrated excitement about the IWB's ability to create new visual art learning experiences, predominantly in drawing, particularly for those with special learning needs. Teachers observed how the IWB itself has the ability to scaffold children into other areas of artistic exploration and learning using different art mediums.

For some children the IWB offered the ability to be very precise about the drawing process, for example by enabling the user to erase mistakes or 'undo' things they did not like, and use the IWB to plan and practise ideas. The IWB created opportunities for teachers, children, their friends and families to reflect on the visual art learning and creativity that had taken place on the IWB when work was saved, and when stories and photographs were downloaded into hard-copy format.

In the next chapter I will discuss the focus group parents' views on visual art and the IWB, the focus group children's use of computers at home and the role of their siblings in the use of computers and visual art learning experiences.

CHAPTER 8

Parents' Views on Visual Art and the IWB, Children's Use of Computers at Home and the Role of Siblings

8.0 Introduction

An interview with the parents of the focus group children was an important aspect of my study. The purpose of the focus group interview was to ascertain parents' views on the visual art programme at the kindergarten and how they viewed their children's engagement in this domain, the impact of the IWB, and to investigate the children's home experiences in visual art and ICT. The information from this interview addresses the research question about the types of knowledge and skills children brought from their homes and community to their use of the IWB for visual art learning.

The parent focus group interview took place in a private room at the school next door to the kindergarten so that it could be carried out without distractions. The parents were able to leave other dependent children at the kindergarten for the morning session so they could attend the interview. Four of the parents of the nine selected children attended the interview, all of whom were mothers – Campbell's mother Cathy,[7] Alex's mother Carol,[8] Jasmine's mother Verity,[9] and Karin's mother Christa.[10] The interview lasted approximately one hour.

Several key themes emerged from interview and these were as follows:

- Teachers 'unpacking' the children's visual art learning experiences with the IWB was important for making the learning visible to the parents
- Parents' understanding of the ways in which the IWB contributed to children's visual art learning experiences
- Computer access in the home environment
- The role of siblings in relation to young children's visual art and ICT learning experiences

These are discussed below.

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7 Campbell at the time of the study was aged 4 years, 4 months.
8 Alex at the time of the study was 4 years, 1 month.
9 Jasmine at the time of the study was 4 years, 2 months.
10 Karin at the time of the study was 4 years, 8 months.

8.1 Teachers 'unpacking' the children's visual art learning experiences with the IWB was important for making the learning visible to the parents

Shortly after the IWB had been installed at the kindergarten the teachers held a formal meeting with parents to explain how it contributed to the kindergarten programme. At this meeting the teachers were able to use the IWB to show-case some of the first Learning Stories they had done of children using the IWB for visual art learning experiences. Although the children often talked at home about using the IWB at the kindergarten most of the focus group mothers had not actually seen their children using it. The mothers appreciated the teachers' analysis of the learning processes with the IWB as it helped them understand what their children were learning. The teachers' formal presentation helped the parents to understand the role the IWB was playing in relation to the visual art. Cathy stated:

> … the night that the teaching team put on the thing for the parents, the families, they showed the evolution of how the children play and [how they are] bringing it into how they are reading and writing. I saw really interesting things there that as parents we don't really see cos we're not in kindy sessions all the time. I think that evening for me was really important… [the teachers showed] the different ways some kids were using the Active Board and then go and do a painting or picture of the same [thing], or vice a versa. It was quite interesting… but I think that's really the only way I see it… through [the teachers] putting on that information evening so we could see where it was heading and the different ways the kids were using it. (4/12/2007)

When I interviewed the teachers they had stated they had given parents presentations about the IWB; afterwards the teachers felt that the parents were 'blown away' by its affordances. They believed this presentation had changed the parents' understanding of how the IWB could contribute to children's visual art learning experiences. Interestingly, despite the teachers perceiving that parents were impressed by the capabilities of the IWB, they had not actually articulated to the teachers what they really felt about the IWB and children's learning. This was noted by Kuini who stated:

> But I don't know what they can articulate … what was their awe about… my awe is just beginning now and we've had it all year! (26/11/2007)

The teachers noted that only one negative comment had been heard about the IWB. This was from a parent who had remarked, "Oh another gadget".

The focus group interview with parents did highlight the mothers' appreciation of the teachers 'unpacking' the role of the technology by sharing their observations and understandings of children's visual art learning show-cased at the parent evening.

This demonstrated the significance of "developing a professional discourse about curriculum" (Anning et al., 2004, p.57) with the parents. By teachers sharing their Learning Stories of children's visual art learning experiences with the IWB, the mothers were able to recognise aspects of their children's learning that were not readily visible. This is a practice advocated by Cowie and Carr (2004) in which assessments become "a venue for the negotiation and navigation of individual and collective learning trajectories" as well as for inviting "participants to discuss together what is being learned and to decide what might come next" (p. 96). The focus group parents clearly gained insights into the visual art learning that occurred with the IWB at the meeting with teachers, giving them opportunities to discuss these with the teachers and each other.

8.2 Understanding of the ways in which the IWB contributed to children's visual art learning experiences

The mothers' perception of the types of visual art learning experiences their children were offered at the kindergarten related mainly to the provision of traditional art mediums. However, Cathy briefly discussed the IWB as a tool for art making, remarking that she thought it was "fantastic the different ways different kids do art" (4/12/07). The introduction of the IWB, and the formal meeting with the teachers, appeared to have broadened her ideas about computer generated art-making tools along with an acceptance of the role technology can play in young children's visual art learning.

The mothers thought that the IWB at the kindergarten had demonstrated to them that the ICT had a place in developing young children's creativity and learning in the visual art. Although they did not specify in what ways, Carol remarked:

> I had never thought about it in terms of art work until I saw how they can do it like that and it is saved…like pictures on paper get screwed up and ripped and stuff like that but [on the IWB] it can be saved…(4/12/2007)

When asked if they thought the IWB made the children more confident and competent in the visual art, they were not sure. Nonetheless, Christa articulated that she felt certain that it was helpful. She identified that this was due to the public nature of the IWB and the way other children could interact with those engaged in the work on the IWB:

> I actually think it does. I think it makes them more sort of like better in themselves because they can interact and because they have their peers behind them [and] they are getting that bit of stimulation and being told "Hey that's cool" or "I don't like that" So it helps them decide themselves what works and what doesn't…(4/12/2007)

Carol's ideas about the skills children were gaining using the IWB appeared to be more related to their learning about the IWB technology rather than visual art learning experiences:

> Alex said he learnt to 'save' it so he's learning how to use the technology to …do more than like draw the picture. He's learnt to save the picture and [the teacher] says there's quite a few steps to actually save the work that he's done so he's learning that you've got to do this in a certain order. He's learning not to be scared of the technology tool. (4/12/2007)

Cathy also recognised the significance of children being surrounded by technology and felt that this may contribute to the children's creative use of the IWB. She pointed out:

> …they're just so naturally attuned. I mean every toy that they have at home has got something… a remote control so they are so into technology and so the creativity side of it… I'm sure that white board must enhance their mind to start thinking 'What can I do with it?" (4/12/2007)

Christa believed that the IWB was important for children's future learning and acknowledged, too, the technology-saturated world in which young children learn and operate. She commented:

> Well I actually think it's skills for the future cos most schools are moving towards tablets and stuff so eventually that's where kids will be using them. And those schools that have it, interacting with a pen on the Board, that's very similar to what a tablet is like so it's teaching them something we're not used to…it's not our technology it's theirs…(4/12/2007)

This idea was further supported by Carol who said that having an IWB at kindergarten had helped increase her own knowledge about ICTs. She stated:

> I didn't know there was such a thing until they got it at the kindy. My older girl - who is at High School, they've got them and she knew about it but I didn't. But I think it's good they have as much technology as they can at kindy age so the kids get used to it because they are going to have it all through their life, they aren't going to be able to escape from technology so I think it's best to get started on it as soon as they can. (4/12/07)

The focus group interview indicated that the mothers were aware that the IWB at the kindergarten was advantageous for their children's learning but were a little unclear about the type of learning that specifically related to the visual art. Nevertheless, the mothers were enthusiastic about its use in the kindergarten environment for visual art learning experiences. They recognised that ICT was an important dimension in their children's lives, and that they were surrounded by technology. This idea has been supported by Bolstad (2004):

> ICT is becoming a ubiquitous component of the physical and social worlds occupied by young children. It is an important part of the private and work lives of most people, including those who support young children's learning and development, whether as parents, family members, caregivers, or early childhood educators. It is often argued in the literature that children's early childhood education experiences should reflect and connect with their experiences in the wider world. Therefore, ICT matters in early childhood education, because it already has an effect on the people and the environments that surround young children's learning and well-being. (p.2)

Like the mothers in this focus group, parents recognising the positive affordances of computers and technology on young children's learning has been noted in a large research study undertaken in the United Kingdom by Marsh, Brooks, Hughes, Ritchie, Roberts and Wright (2005). They found that, overall, the parents in their study supported "their children's interest in popular culture, media and new technologies" (p.5) noting that parents "welcome further work in schools on new technologies" (p.5). Just as the mothers in this study revealed, Marsh et al. (2005) reported that parents "…feel that this is needed in order to prepare children for the demands of the new technological age" (pp.5-6).

8.3 Computer access in the home environment

In the focus group interview I asked the mothers about whether they had computers at home and whether the children used them. In the focus children's households there was at least one computer available. Two of the mothers, Carol and Christa, who both had big families, had four computers available at home. All stated that their children used their computers at home, on their own or with their siblings.

The mothers commented that the types of things their children did on the computers at home were generally games-based learning experiences. Carol noted that when her son Alex used the computer:

> He does sit down and draw and stuff but he doesn't use paint and stuff on the computer… more games, educational games that he likes. (4/12/2007)

Some of the children's games had visual art activities. Verity, for example, had this to say about Jasmine's engagement with the computer games:

> … as soon as she gets home she jumps straight on her computer, jumps on Dora the Explorer…she likes to do all the different shapes on the painting, and clicking on all the colours…she always kicks me off it… (4/12/07)

Cathy thought computer use at home was probably helpful for Campbell's confidence with the technology. She observed:

> … he's not scared of it. He's not scared of using the computer and making mistakes, he couldn't care less and I don't know if it's made a difference… if he doesn't feel scared at kindy to do things like that. (4/12/07)

I was not surprised to find that the focus children had access to and used computers in their homes. A survey carried out on the media and technology use of New Zealand children aged 6-13 years conducted by research agency Colmar Brunton for the Broadcasting Standards Authority (2008) found:

> Virtually all New Zealand children's homes contain a television (99.5%), cellphone (96%), radio (95%) and DVD player (92%). Most homes have a computer (88%), video (79%), digital camera (75%), games console for TV (66%) and MP3 player (56%). Relatively fewer homes have a decoder (47%), a hand-held games console (35%) or a camcorder (34%)…
>
> In line with the widespread availability of different media in their homes, children use a range of different media. Large majorities of children watch TV programmes (99%), watch video tapes or DVDs (93%), play computer or video games (84%), listen to the radio (76%), and use the internet (62%). Forty two percent of children use a cellphone and 35% watch recorded TV programmes. (p.3)

Although this study focused primarily on 6-13 year-old children the researchers took advantage of this opportunity to gain insight into media use in the home by 4-5 year-olds. They discovered that:

> … the majority of 4-5 year-old children watch TV (95%) and video tapes or DVDs (85%). Over half play computer or video games (59%) and listen to the radio (53%). One-third of 4-5 year-olds watch recorded TV programmes (33%), and one in five use the internet (20%). Only 8% of 4-5 year-olds use a cellphone. (p. 5)

The researchers noted that there were marked inequities in access to new media, with Pacific and Māori children in particular falling behind Asian and Pākehā children in this regard. They stated that "in New Zealand, children on the wrong side of this so-called 'digital divide' are more likely to be from households with a lower socio-economic status, Māori descent, or from single-parent families" (p.135). Despite the low socio-economic area of the case study kindergarten community the mothers in the focus group interview did not show that income was a barrier to accessing computers or that they were on the wrong side of a 'digital divide' (BSA, 2008, p. 135). As technology in New Zealand becomes cheaper and more accessible it may be that this 'divide' is becoming less evident. This is certainly the case in Australia. A major study carried out by the Australian regulator for broadcasting, ACMA, into media and communications in Australian family homes (2007) established that: "…electronic media and communications devices were found to be as pervasive in Australian homes with lower incomes as in those with greater means" (ACMA, 2007 cited in BSA, 2008, p. 135).

Taking into consideration the mothers' comments about their children's computer use at home, I believe that this may have helped the children to navigate the technologies they had access to at the kindergarten. As the BSA report (2008) notes "rather than being naïve and unsophisticated, children are active agents in their relationships with media and bring with them a host of skills and knowledge" (p.135).

8.4 The role of siblings in relation to young children's visual art and ICT learning experiences

The mothers were asked whether they thought their children gained any knowledge, skills or experience from their relationships with their brothers and sisters in the areas of visual art and/or ICT use. Both Cathy and Carol said that they had noticed that older siblings often motivated the younger children. They had observed that the younger children often copied ideas from the older ones and were inspired to engage with art-making themselves. Kathy commented:

> …at home he'll [Campbell] will do more beside his older sister who he will try to copy… Campbell and Rory [the younger children] really emulate what Gracie does, she's 6 and she's very into making cards and drawing pictures and making patterns so the others two hop up there and sit beside her and copy her… the confidence he [Campbell] gets from that kind of stuff at home he does bring to kindy and maybe that why he's started doing more printing and making, and he's asking to use the computer at home when before he never had… (4/12/2007)

Carol had observed similar behaviour and remarked:

> He's [Alex] got a five year old sister too and there's only 13 months between him and his sister….He copies what she does a lot! (4/12/2007)

These comments illustrate that the role of siblings often played a part in the focus children's engagement in visual art making at home. The mothers also felt this was the case with the younger children's learning about and use of ICT. Carol noted that observing the older children was a common behaviour for Alex:

> …he likes to watch his older brother and older sister play games on the computer and he watches and he gives his input as to what they should be doing when they are playing these games…which isn't always wanted by them. (4/12/2007)

Christa commented as well that her daughter Karin had four older sisters and they had a big impact on her learning, although she did not specify in what ways. She mentioned, however, that she felt that the kindergarten was a place for Karin to get away from the technology at home and give her the opportunity to engage in a range of other activities.

> … the kids have always had technology in the home. Dad's into that, it's his business anyway so I mean he involves them in that sort of thing. So for them sometime it's a bit ho hum… they can get a bit of a saturation level at home so it's nice they've got a place where they can get away from it I suppose… (4/12/2007)

As these statements indicate, the focus children's older siblings appeared to influence their learning. Having more knowledge in these areas, older siblings appeared to scaffold the younger children's learning by role modelling practice in visual art and/or ICT, demonstrating techniques and ideas that the younger ones copied directly or developing their ideas by watching and observing. This is supported by Smith (1999, p. 86) who states that:

> …socio-cultural perspectives emphasise that children's higher mental processes are formed through the scaffolding of children's developing understanding through social interactions with skilled partners. If children are to acquire knowledge about their world it is crucial that they engage in shared experiences with relevant scripts, events, and objects with adults (and peers).

In this study it was the focus children's siblings who had the role of 'skilled partners' in relation to both art-making and use of computers.

8.5 Chapter summary

The children's use of the IWB appeared to broaden the focus group mothers' ideas about computer generated art-making tools and the acceptance of the IWB as another element of the children's visual art learning experiences at the kindergarten. However, their understanding of the role of the IWB in this domain was very much assisted by teachers' sharing of observations and understandings of children's learning with the IWB at a formal parent meeting.

The mothers perceived that the use of ICT was an important dimension in their children's lives and in their education. They recognised that 21st century children live in a technology-saturated world and this was supported by the children's use of computers at home. They felt that exposure to ICTs had contributed to their children's use of the IWB. All of the children had computers at home which they used either by themselves or with their older siblings. It appeared that older siblings had an important influence on the younger sibling's engagement in visual art and ICT learning experiences.

In the next chapter I will discuss some of the problems I identified in the study of using an IWB for visual art learning. The potential uses and possibilities of using an IWB in this area are also explored.

CHAPTER 9

Discussion of the Problems and the Potential of Using an IWB for Visual Art Learning Experiences Arising from this Study

9.1 Introduction

When analysing the raw data for this study, problems with the IWB that teachers and children encountered using the technology for visual art learning experiences were identified. The analysis of the key themes also signalled possibilities and areas of exploration that teachers and children had not yet discovered. This chapter critically examines in depth both the problems and possibilities.

9.2 Identification of problems and issues relating to the use of the IWB for visual art learning experiences

Several problems and issues were identified in the study. These related to: the height of the IWB, the digital pen, disabling of the computer by the children, the limitations of a 'process rather than a product' approach with IWB, and the lack of time and access to appropriate early childhood professional development and training for the teachers. These are discussed below.

The height of the IWB

The phenomenon of IWBs being positioned too high for young children has been noted by Siraj-Baltchford and Siraj-Blatchford (2003). In this study the installation height of the ACTIVboard did create some access issues for some of the smaller children, particularly in relation to the use of software drawing tools and utilising the whole space for their drawing. The problem was usually solved by children standing on chairs in front of the board which gave them some height advantage but which limited their sideways use of the IWB. To give children better access to the whole board it needed to be lowered or a small platform installed.

It is interesting to note that Activboard+2, a newer but more expensive model of the ACTIVboard than that used at the case study kindergarten, has been developed with a height adjustable stand in order to meet the height requirements of different users. Other IWB manufacturers offer other solutions, for example, Mimeo IWBs operate using a capture bar (rather than a solid board) which can be attached to a conventional whiteboard at heights which suit users. From my findings I would

suggest that teachers who are thinking of purchasing an IWB for use in an early childhood setting or with young children, need to be aware of the height issue and carefully investigate the type of IWB which best suits the needs of small children.

The digital pen

In this study I observed that there was sometimes a problem due the vulnerability of the ACTIVboard's digital pen. If the fibreglass nib of an interactive pen got lost, which happened when children removed it from the casing, the IWB could not be used until the nib was found or replaced. The case study teachers, however, were able to access spare nibs from Promethean that helped with this problem.

The ACTIVboard pen is quite thick due to the electronic hardware built into it and I felt that the thickness of the pen made the pen hard to manipulate for the smaller children, often making their drawing movements clumsy. An example of this occurred in an observation of Brian (aged 4 years, 3 months):

> He discovers in his exploration that he can move the shapes around with his pen and he tries to move them off the page by moving them over the edge but the keep bouncing back onto the page. I show him the rubbish bin and how to move the images into the bin. He tries several times and usually fails to get them in. Kuini comes past and she helps him by showing him where to put the pen and how to carefully put them in the bin. His grip on the pen (this pen is not that great for little children!) is problematic so Keri shows him how to hold it so he has more control. She is patient as he tries again and again and eventually clears the Board. (3/12/2007)

The pen contains electronic hardware that enables it to function as an interactive mouse on the IWB. Like a traditional computer mouse, pens have a 'right click' affordance, which is a small button located on the top of the pen. The kindergarten teachers told me, during the course of the research, that they had had this feature disabled as they felt it confused the children and interfered with their work. I would argue that a smaller, simpler pen needs to be developed by ACTIVboard manufacturers[11] and made available as an alternative option for early childhood consumers so that young children can more effectively use this type of IWB for not only visual art learning experiences such as drawing, but writing as well. It is important to note that some IWBs, such as Smart Boards, can be manipulated using the fingers as well as pens. Nonetheless, despite this, the case study children were not deterred from using the technology and most were able to manipulate the pen tool effectively, creating successful art work on the IWB.

[11] Interestingly, during the time of the study I discussed this issue with a New Zealand manager for Promethean who said that earlier models of the pen had been slimmer. He generously found some old stock of this pen and sent it to the kindergarten.

Disabling of the computer

Another problem that occurred with the IWB was the disabling of the computer by the children. This sometimes happened because the keyboard and mouse attached to the computer were used inappropriately by other children not working with the IWB. I observed that this was annoying for children who were working on the IWB itself, and it sometimes resulted in other children accidentally sabotaging the computer. Staff identified that this problem would probably be rectified if they purchased a remote mouse and keyboard for the computer which could be placed on a shelf out of the way of the children.

Many of the children did not have the literacy skills to know what programme to open on the IWB; consequently they sometimes randomly opened several things at once. Staff could not always be near the computer to support children opening or shutting programmes. I noticed this accidental sabotaging occurring on one occasion when a child began exploring the ACTIVprimary lessons on the board but did not close them after he had used them (in part because he was small and reaching the close icon was difficult for him), continuing to enthusiastically open more and more new ones. I observed in my field notes:

> Tom has a really big turn on the Active Board and is interested in the activities section. He works out ways to open the activities easily so moves through a huge range of things, sometimes discovering some quite neat things ... Tom doesn't close the activity when he finishes with it and so has heaps of things open on the Board which does a major hemorrhage when Tama and his friends arrive... (11/12/07)

The teachers often were able to rectify this problem by restarting the computer. However, sometimes it required major re-configuration to get the problems sorted out. Because of this risk the teachers had stopped letting the children use their laptops with the IWB, and only connected them to the IWB when something specific was to be shared by teachers with the children or parents. Despite this issue, during the course of my research, the children's ability to work on the IWB was not prevented for very long.

The limitations of a 'process rather than a product' approach with IWB

The teachers in this study had adopted a 'process rather than a product' approach to the children's use of the IWB for drawing. This approach was mainly due to a concern for the cost involved in printing children's work but also perhaps the result of an evolving pedagogical approach by the teaching team to the use of the IWB and other ICTs in this domain. In the focus group interview Kuini remarked:

> …and even [developing] ideas around ICT and what ICT is in early childhood…kinda like now we've got a new team we've got to develop some ideas about what that is and what it isn't… so that the 'what it is' happens!…We have to work out what it is and what it means here. (26/11/07)

Children's work on the IWB was sometimes saved in a file on the computer and/or used as assessment evidence for Learning Stories. These were printed off in hard copy for the children's portfolios, but on the whole children's drawings on the IWB were not saved consistently on the computer or printed off.

This approach was necessary at the time of this study as the teachers were in the process of developing their own understandings of how the IWB could be most effectively used, and beginning to frame their pedagogy around these understandings. However, with further professional development using a socio-cultural/constructivist approach to the use of the IWB for enhancing young children's visual art learning experiences, it is likely that the teachers would consider both the process and the resulting product of children's work on the IWB as having equal value. Such an approach creates more possibilities for children to reflect on their work, either finished or in progress, just as they are able to do with their art created with traditional mediums. This increases the opportunities for children to discuss their creative ideas and thinking with their teachers and friends. I anticipate, too, that opportunities for sharing, displaying and celebrating art work that had created on the IWB with the children's friends and family would also be enhanced.

Generating hard copy prints[12] of the children's work is not a necessary part of this process, but having good methods of saving and storing images is important. Other methods of displaying children's work could include: storing the images in individual children's computer files which they have free access to, uploading them to a kindergarten blog or website, or sending work in an e-mail to the child's home computer once it had been completed.

> Keanu has a tail on today. He's pleased because he has scored it before Levi could get it! He wants to play dogs with me – our usual game – but I am still putting my folder together so I suggest he draws me a dog house on the Board while he waits. He has a random explore but isn't on task with the drawing so I prompt him again and give him more of my attention this time. He does a wonderful drawing! He draws a swimming pool and adds a tongue to his dog [which is drawn from an aerial perspective] so it can drink from the pool. I ask him to make the pool a different colour so he uses the fill tool as well as the drawing tool in this work. NOTE: Teacher input (encouraging, questioning, prompting, suggesting, enjoying and appreciating the work) in this area can be very effective for deep engagement in a drawing I think.

[12] If it was affordable printing images could, nonetheless, be very effective for display and inclusion in children's portfolios.

Lack of time and access to appropriate early childhood professional development and training for the teachers

The teachers identified in the focus group interview that they found the IWB technology complex, and that there was a huge amount that needed to be learnt about the technology so that it could be most effectively used for their teaching. They recognised that not having enough time to explore the potential of the IWB and practise new skills with the IWB was an issue for them. This often resulted in too few opportunities to practise skills and sometimes they forgot things that they had learnt.

They also saw that there was a need for professional development for early childhood teachers. Some useful and successful technical training had been initially provided by the first ACTIVboard representative who had worked with Kuini and Kathy, the two teachers who had initiated the installation of the IWB. They found her approach very beneficial and she appeared to have good insight into working with young children. However, the other teachers had not had this training as this particular representative had left the company by the time they were employed at the kindergarten. At the time of the study, time for professional development and training with the IWB was also compromised by the teachers adjusting to and getting to grips with a new teaching team, and the restructured kindergarten sessions.

Appropriate professional development was not available for the case study kindergarten teachers at the time of this study that specifically looked at how they could use the IWB to implement the principles, strands and goals of the early childhood curriculum *Te Whāriki,* or provide support for developing their pedagogy in relation to integrating the IWB into their teaching. Even though the ACTIVboards representatives who worked with the teachers had good technical skills, and sometimes primary and/or secondary teaching experience, they were not au fait with the early childhood curriculum. It is important to recognise that the models of curriculum and teacher practice in the education sectors is substantially different and this requires an understanding of the differences so that IWB pedagogy, and resulting practices, is appropriate to a specific sector.

How early childhood teachers support, scaffold and encourage young children's explorations in visual art using digital technologies such as IWBs will, to a large degree, depend on their own confidence and competence with the technologies (Jones & Scrimshaw, 1988; Long, 2001; Prensky, 2001). Whilst there is support for early childhood teachers developing skills with ICT through Ministry of Education early childhood contracts, such as the Ministry of Education's *Te Whāriki* professional

development contract and the Early Childhood Education Information Communication Technology Professional Learning pilot project, to date these have not focused specifically on developing skills and knowledge around the use of IWBs. This could be due to limited use of IWBs in early childhood education centres due to their high cost and the paucity of evidence (both in New Zealand and overseas) of the efficacy of the IWB as an appropriate teaching and learning tool (as discussed in Chapter 2).

9.3 Developing the potential of the IWB for visual art learning experiences

Several potential areas of development, which open up new possibilities for using an IWB for visual art learning experiences have been identified throughout the study. These related to: using a variety of creative software, increasing the availability of diverse images and photographs on the IWB, using internet sites designed for use with IWBs, and using the digital convergence aspects of the IWB to its full capacity. These are examined below.

Using a variety of creative software

The ACTIVprimary software that the case study children used for their visual art making experiences provided a basic range of tools for their drawing. Whilst the work they produced was interesting and was able to develop in complexity as they learnt how to manipulate an increasing range of tools, I felt their art explorations, and indeed explorations of other activities, were limited by the software rather than the IWB technology. An example of this is recorded in my field notes:

> There were lots of children wanting the 'games' from the software today. Later in the morning Ansell joined Alex and Tom at the Board and started shuffling through the games…I thought that so many of them are useless for the children and are not age appropriate for this group. So much of the time they search futilely for ways to move around the game. The sections are all so text based that its random hit-and-miss behaviour that has nothing to do with meaningful learning. It began to irritate me after a while and also make my head spin as they moved so rapidly through the games trying to find something they could do.
>
> I guess there are some limitations to the Board…well not the Board and the actual technology, rather the software that is on it. (7/12/07)

The ACTIVprimary drawing software does not include digital art making tools such as paint brushes, crayons, spray cans, or rollers that more specialist art software packages include. Nonetheless, the interactive affordance of IWBs allows other software packages to be used successfully. For example, the Microsoft Office suite works well on the IWB, as do art-making and drawing software packages, such as ArtRage or Kid Pix. Animation software that can incorporate drawing and visual-art

making, such as I Can Animate or 2Animate, can also be used extremely well with an IWB. This means that children need not be limited to only using the IWB brand's standard software for their creative visual art explorations.

Teachers, furthermore, may need to be alerted to the types of software that best suit young children's use of an IWB. For instance, new software products designed to enhance literacy and that include a visual art component, have recently been developed by a New Zealand company Synapse Learning http://www.synapselearning.co.nz/, specifically for use on IWBs. Whilst much of this software targets children in junior classes I would argue it is likely that some of these products may have application in an early childhood setting as they have the flexibility to be used with younger children in meaningful ways.

Increasing the availability of diverse images and photographs on the IWB

Pictorial and photographic images can be incorporated into young children's visual art learning experiences. Giving children opportunities to choose, arrange, manipulate and discuss these types of visual images is a valid form of visual art learning for young children. Ashton (2008) suggests that "…images and 'stuff from' everyday life, visual culture, computer-generated images..." not only contribute to enriching children's visual art experience but also provide excellent materials for "…inquiry and vocabulary enrichment" (p.86). In the teachers' focus group interview, Kathy noted that she had taken some photographs on a trip to Australia that she thought the children would find interesting and wanted to add these to the image library in ACTIVprimary for the children to use. Using opportunities such as this, enlarging and diversifying image collections, is an excellent way to use IWB technology for children's visual art learning.

Ensuring that children have a rich collection of images to draw from that include a range of New Zealand specific images adds new possibilities for children's explorations that are relevant to their own cultural or social context. Images can be generated by teachers and children themselves or downloaded from the internet. For instance, the ACTIVboard website has free resource packs of New Zealand specific material that can be downloaded (http://www.activboardnz.com/resources.html). These include a New Zealand resource pack that has iconic New Zealand images, maps, currency, and a variety of literacy and numeracy resources suitable for early childhood, and a Māori language resource pack with vocabulary and phrases in Te Reo Māori, sounds and useful web links.

Using internet sites designed for use with IWBs

Increasingly, websites are now being developed by art galleries and other art institutions that provide opportunities for young children to explore aspects of a gallery's art collection and/or to undertake digital art-making activities within the website. These sites are often designed for use with IWBs. The Tate Modern Gallery in London, for instance, has responded to the roll-out of IWBs in classrooms in the UK (Somekh et al., 2007) by developing specific art modules for use on the IWB. An example of one of several art modules for older children which shows the possibilities that an IWB can generate in visual art teaching and learning[13] is highlighted below.

Welcome to a preview of **Tate Tools Module 1 - Looking At and Thinking About Art** - a teaching resource for pupils at Key Stages 2 & 3 of the National Curriculum for England and Wales.

This module asks students to look at and discuss different art media and genre. It asks them to think about what art is and what it is not.

All Tate Tools modules are PowerPoint presentations ready for use with an interactive whiteboard, computer projector or on a standard display. They include:

- video conversations with a curator, educators and children
- speakers' notes to help you prepare a lesson
- Investigation Sheets to help students take notes and consolidate their thinking
- two puzzles and games to test knowledge and inspire discussion

Most importantly, the module will help you bring alive key curriculum points by using the vast resources of the Tate's collections and expertise.

Art Module

There are also resources available for young children for use with an IWB. *Tate Create* (http://kids.tate.org.uk/) has a range of suitable art related activities. For example, in *Tate Paint* children can create their own digital painting which can also be animated, framed, sent to a friend via e-mail, and submitted to be hung in the Tate digital art gallery. Websites such as these use the multi-modal functionality of an IWB extremely effectively, as well as providing an exciting range of new art learning possibilities for young children.[14]

Using the multi-convergence aspects of the IWB to its full capacity

An IWB has digital convergence capabilities (as discussed in Chapter 2) that make it possible for children to use a range of different software programmes as well harness its digital communication affordances, such as access to the internet, e-mail

[13] Information taken from http://www.tate.org.uk/schoolsteachers/tatetools/modules/preview.shtm

[14] For a range of quality creative websites see Visual art Education ECE http://visualartseducationece.blogspot.com/2008/06/visual-arts-in-early-childhood-settings.html blog posting August 2007: Visiting Art Galleries On-Line.

and video conferencing. As Luke (1999, p. 97) points out, young children are increasingly being exposed to multiple "information modalities" which include: print, numbers, symbols, photographs, animations, movies, DVDs, video, CD-ROMs and website environments. I argue that the digital convergence affordances of the IWB can assist children to represent and communicate their creative ideas multi-modally.

Creating flipcharts in ACTIVprimary or e-books in PowerPoint are ways in which children can add new dimensions to their art work on the IWB by including multi-modal elements such as sound, written text, video clips, or photographs (Terreni, Shuker & Carey, 2008). Using an IWB this way can enrich and deepen children's visual art learning experiences and visual literacy. In agreement with Colbert (2006) I believe ICTs have a powerful ability to extend and enrich children's story telling and literacy, and when teachers and children are made aware of the multi-modal possibilities of the IWB it is likely that children's visual art learning experiences as well as their literacy experiences can be deepened.

Using the communication affordance of an IWB also opens up new possibilities for children to share their visual art learning experiences with their families and community. For example, a child may want to send an e-mail with a drawing, animation or video clip attachment to friends or family at home or abroad, or to mum at the office, or to a friend in Auckland.

Extending children's interests through the use of the IWB to enhance learning

Assessing and extending children's learning by noticing, recognising and responding to their knowledge and interests (Ministry of Education, 2004) is a teaching practice increasingly being used in New Zealand early childhood settings. The IWB has potential for helping children develop and extend their knowledge and interests. By way of illustration, the internet capability of the IWB can be used for in-depth inquiry into topics that interest children, as well as providing them with a tool for actively exploring and developing ideas related to their interests.

In my case study the possibility for deepening children's learning based on their interests was exemplified during a participant observation of Alex (see Chapter 6) who was engaged in creating a block building. With my encouragement he was able to translate his three-dimensional building into a two-dimensional drawing on the IWB. As a participant observer engaged in research, my level of engagement with Alex was limited by my role. However, through experiencing this small visual art

learning experience with Alex, I recognised the potential that the IWB could offer teachers and children.

9.4 Chapter summary

In this chapter I identified problems and issues I observed with the IWB. These included: children having problems with the height of the IWB and the digital pen, children disabling the computer, the limitations of a process rather than a product approach with IWB and, finally, the lack of time and access to appropriate early childhood professional development and training for the teachers.

The possibilities for extending children's visual art learning experiences were explored to clearly show the affordances IWBs offer in this domain. These included: extending the use of the IWB in visual art by using a variety of creative software on the IWB; increasing the availability of diverse images and photographs on the IWB; using internet sites designed for use with IWBs; and using the digital convergence aspects of the IWB to its full capacity so children can develop work multi-modally.

In the next chapter I summarise the findings from the research and suggest directions for future research.

CHAPTER 10

Conclusion and Recommendations

10.1 Introduction

My research was based on the broad question:

1) How do teachers and children use an Interactive Whiteboard for visual art learning experiences in a kindergarten setting?

The sub-questions that I asked were:

2) What knowledge and experience did teachers and children bring to their use of an Interactive Whiteboard for visual art learning experiences?
3) What teaching strategies did teachers employ to assist children to use the Interactive Whiteboard for visual art learning experiences?
4) What learning strategies did children use when using the Interactive Whiteboard for visual art learning experiences?
5) What evidence was there of socially constructed learning for both the teachers and the children using the Interactive Whiteboard for visual art learning experiences?

My case study examined both the teachers' and children's use of the IWB for supporting children's visual art learning experiences. Using a qualitative approach permitted data to be collected through techniques such as: participant observations which were important for gathering descriptions of teachers' and children's use of the IWB; focus group interviews which were essential for capturing the points of view of teachers and parents; and finally, examining teachers' Learning Stories gave further insights into the children's use of the IWB. These were examined in relation to socio-cultural theory and practice, which provided a framework for analysing and interpreting my research data.

Key findings from my study are briefly summarized here, and recommendations are made, where relevant, of ways in which the IWB could more effectively enhance young children's learning. The limitations of this thesis, possibilities for future research and professional development for teachers are also discussed.

10.2 Summary of main research findings

The way the IWB was used by the children at the case study kindergarten to a large extent reflected the teachers' knowledge and experience of early childhood visual art pedagogy (see Chapter 5). This appeared to be rooted firmly in the New Zealand early childhood curriculum (Ministry of Education, 1996). What was seen as good practice for young children's visual art learning experiences with traditional art mediums was also applied to the digital art learning experiences on the IWB. For example, key teaching practices that assisted the children with using the IWB for enhancing their visual art learning experiences included: making sure the IWB was freely available throughout the session so that children could use it when they felt like it, and giving children an unlimited amount of time to use the IWB so they were able to fully develop their creative ideas and practise technical skills. The IWB was seen as another visual art 'tool' which could mediate children's thinking (Vygotsky, 1982) and assist their learning (see Chapter 3).

The case study teachers' pedagogy in relation to the visual art, particularly with the IWB, included the child-centered belief that the process of art making was more important than the final product (Richards, 2005). This approach appeared, at the time, to be expedient because of concerns about the costs involved in printing children's digital art as hard copies. However, in agreement with Richards (2005) I firmly believe that it is important for children to have access to the evidence, for instance, the product, of their art work made on the IWB. An art product, or 'work', is an important tool for reflection which enables teachers, parents, children and other interested parties (the audience) to discuss the work, and give encouragement and feedback to children. I recommend that printing children's art work in hard copy is a good way to create a tangible product even though it can incur expense.[15] Moreover, I also recommend saving work as a digital file (that can be easily accessed by children, teachers and families) as another way to keep children's work. Digital files can either be kept on the EC centre computers and/or sent home via e-mail to children's home computers.

The central location of the IWB and its size were important. This made it very accessible to the children and teachers, and provided children the opportunity to either work individually on the IWB or in small groups. The central location and the largeness of the IWB provided children with good visible access which supported

[15] It is perhaps helpful for teachers to consider that if the IWB is to be used as an art tool then it must be recognised that printing the art made on it will incur costs, just as the use of traditional media incurs costs as children produce their work.

observation as a strategy for their learning (Williamson & Meltzoff, 2008). When children watched other children using the IWB for visual art learning, they frequently imitated these observed behaviours (see Chapter 6). In the case study kindergarten the location of the IWB in the area where children had their group mat-times enabled the teachers to use the IWB easily with the large group. The large size of the IWB was something that appeared to give children new opportunities for their visual art learning. They enjoyed the opportunity to use their large motor skills in the process of drawing. As large drawing exercises were provided only rarely with traditional mediums the large size of the IWB was identified by the teachers as a feature of the IWB that seemed to attract children.

A significant finding in the study revealed that the technical complexity of the IWB appeared to foster teachers' engagement with the children's visual art learning experiences using the technology. For children to use the IWB successfully for their visual art learning experiences, teacher scaffolding and input (Kindler, 1996) were important elements in their learning process (see Chapter 7) and I felt that this also helped with their art work on the IWB. As Loveless (2007, p. 9) suggests, "free play with digital technologies … does not guarantee effective or creative engagement or development, and there is still a need to support and guide children's interactions in informed ways." What was also evident from the study was the role competent and confident children played in scaffolding their peers and how children often worked together collaboratively with ideas for their digital art works on the IWB. The teachers' role in scaffolding children enabled them to master increasingly complex tasks with the IWB. The learning gained in this way appeared to shape their skill development with the IWB. This was particularly evident with very young learners (see Chapter 6, and Appendix M).

The IWB successfully fostered collaborative tuakana/teina relationships (Tangaere, 1996) where it was abundantly evident that socially constructed learning (Brooks, 2005) took place in relation to visual art learning experiences (see Chapter 6). Older children regularly supported younger children, peers worked together, and younger but more skilled users helped less able users to master techniques. As well as enhancing their learning, this appeared to be very empowering for children. Interestingly, children often taught the teachers new ways of doing things on the IWB as well.

Another important finding from this study was the way in which the IWB motivated children with special learning needs. A child with a profound hearing loss and a child

with Down Syndrome attending the case study kindergarten appeared to significantly develop their visual art learning experiences by using the IWB. Once they had mastered skills with the IWB they were able to take on leadership roles with the technology with other children. For these children the IWB became not only a visual art tool but also a vehicle for communication and interaction with other children. For the deaf child the IWB was a significant bridging tool into his use of traditional art media (see Chapter 7).

The digital affordances of the ACTIVboard software used on the IWB gave children new opportunities for their visual art learning. Tools such as the rubber/eraser tool and the 'fill' tool enabled children to do things that could not be done with traditional media and allowed for greater digital manipulation of the images they created on the IWB. Their images could be digitally changed, moved around, erased, and coloured in. The affordances enabled children to easily adjust their drawings if they were not satisfied with a result, rather than starting over again. As the children learnt to master the different components of the drawing software and how to utilise these effectively, they were able to undertake increasingly complex drawings.

Children's story telling using their drawings appeared to be motivated and encouraged by the IWB. This process enhanced both their visual art skills and oral literacy. An interested and encouraging adult was an important presence for this to occur. The digital convergence ability of an IWB has the potential for enabling children to use more than just the mode of drawing in their work. An IWB allows for the inclusion of written text, recorded sounds and speech, photographs and video clips. I recommend that as teachers develop their own skills and knowledge about how to maximise the potential of the IWB, they begin to work with children to extend their story telling and visual art making to include an increased range of communication modes. This would add new dimensions to children's work, add complexity to their learning, and enable them to bring in greater references to the types of media and subject matter that interest them.

Having access to professional development relevant to the early childhood context in relation to the IWB was identified as an issue for the teachers in this study (see Chapter 9). One of my key recommendations as a result of this research is for the Ministry of Education (and its service providers) to offer professional support and expertise to centres using IWBs. One way that this can be done is through the establishment of IWB professional development and cluster networks where participants work together with a skilled ECE ICT professional development

facilitator. Such a network would enable participants to share their individual skills, knowledge, successes and challenges with using IWBs.[16] This knowledge and experience has the potential to generate new ideas and information about best practice with IWBs for the early childhood sector.

10.3 Limitations of this study

It is important to recognise that my study was very small (a case study of one kindergarten) and that the focus was limited to the area of visual art learning experiences in a kindergarten setting. Further, only one type of IWB (an ACTIVboard) was investigated. This means that the study can make no claims to being typical in the use of an IWB for visual art learning experiences in the wider range of New Zealand early childhood contexts, and the findings about this particular type of IWB cannot be generalised (Yin, 2003).

10.4 Future research

Whilst this study provided some important insights into the use of an IWB for visual art learning in New Zealand kindergarten, I feel future research needs to examine the use of an IWB across the whole ECE curriculum and in a variety of different early childhood contexts. The use of IWBs appears to be increasing in early childhood education services (IWB professional development cluster network held in March 2009) and it has become evident that a range of IWBs, such as Mimeo, Smart Boards and Interwrite boards, are being purchased by education institutions. It is interesting to note that in the course of writing my Masters thesis (December 2007 to March 2009) there are now six early childhood centres in my region (that I know about) using IWBs.

The literature review undertaken for this research revealed a need for pedagogically appropriate professional development for early childhood centres using IWBs. I feel that the professional development approach and the types of support that are the most useful to early childhood teachers need to be determined through research. In my study, the IWB being used was an ACTIVboard and professional development and technical training was provided in New Zealand by Promethean sales representatives who, in many cases, have primary and/or secondary school experience but no early childhood experience. One way to carry out such research would be to undertake a collaborative research project with Promethean. This would

[16] An IWB cluster network in my region has recently been established which I facilitate in my role as a professional development provider. A total of 25 enthusiastic teachers attended the first meetings of the network in February and March 2009.

require an ECE professional development provider, who has skills and experience in the use of ICT and IWBs to extend children's learning, to work with staff from an early childhood centre that use an ACTIVboard, and a trainer from Promethean. An investigation of what constitutes effective and appropriate professional development particular to this type of IWB would be an important area to explore in a case study such as this. I feel that the resulting research could be beneficial not only to early childhood teachers who use ACTIVboards, but also to Promethean, which is likely to generate more sales of its IWBs to early childhood centres in the future.

The Ministry of Education's (2009) series of booklets about best assessment practices in early childhood settings was released in March. These booklets focus on assessment in the domains of: oral, written and visual literacy, mathematics, the Arts, and ICT. The exemplars included in *Information communication technology (ICT): Te hangarau pārongo me te whakawhitiwhiti* (Ministry of Education, 2009) specifically look at the use of ICT in an early childhood context and demonstrate how ICT can assist teachers with the documentation of children's learning which "facilitates the provision of more interesting, authentic and immediate data for assessment" (Ministry of Education, 2009, p. 3). The use of an IWB in this process, however, is not explored in the booklet. Therefore, another interesting, relevant, and timely research project could investigate the ways in which IWBs can best support teachers and children in assessment for learning processes.

Finally, the findings from my research indicate that an IWB can play a useful role in extending and enriching young children's visual art learning experiences in an early childhood context. The affordances of this digital convergence technology can provide new visual art learning experiences for young children that can complement traditional visual art experiences provided in early childhood settings. On-going research would further benefit our understandings about what constitutes best practice for enhancing young children's learning with IWB technology in visual art and across the curriculum, as well as determining the most effective professional develop to enhance teachers' skills and pedagogy.

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Appendix A:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

INFORMATION SHEET [Manager, Hutt City Kindergarten Association]

My name is Lisa Terreni and I am a Masters student in Education at Victoria University of Wellington College of Education. As part of this degree I am undertaking a research based thesis. I am also a lecturer and professional development facilitator for the School of Early Childhood Teacher Education and I work principally in the area of visual art education.

The purpose of my research is to find out what learning strategies children employ when they use an Interactive Whiteboard in their visual art learning experiences. I am also examining how teachers support the children in their use of the Interactive Whiteboard in this area and what type of existing knowledge and skills the children bring to this experience. I am requesting your permission to use Glendale kindergarten for my case study. My research is being supervised by Dr Mary Jane Shuker (Ph: 463 9659).

The study will involve:

1. Participant observations of the children and teachers using the Interactive Whiteboard and their engagement in the kindergarten's visual art programme. As a participant observer I will be recording them using field notes, video and digital photographs. The collection of data will be carried out over 4 consecutive weeks from 9am to 12:30pm.

2. Specific observations of a selected group of 8 children (2 four year old boys and 2 four year old girls, 2 three year old boys and 2 three year old girls) as they engage with the Interactive Whiteboard in visual art learning experiences.

3. Interviewing the four teachers (1 focus group interview, with informal discussions throughout the research process). It is anticipated that this will take 1 to 1 ½ hours.

4. Examining teachers' documentation of the children using the Interactive Whiteboard while engaged in visual art learning experiences. For example, Learning Stories, photographs and/or videos.

5. Interview the parents of the 8 selected children (1 focus group interview, and informal discussions throughout the research process). It is anticipated that this will take 1 to ½ hours.

This research will take approximately one month, starting at the beginning of November 2007.

While complete anonymity cannot be guaranteed, complete confidentiality (no names will be used) will be assured to both the participants and the kindergarten during the course of the data gathering and observation stages. The information gathered from this study will be kept in a secure place and will be viewed only by my supervisor and myself, and destroyed after five years. Analysis of the data will be reported in written form, supported by visual documentation in the form of photographs and video. Permission for using specific visual documentation will be sought from the participants in the study.

The teachers, children and parents involved in the study will have the right to check the data collected throughout the observation and interview gathering processes. A summary of the results will be made available on completion of the research project, and a meeting to discuss the findings of the research will be organised.

This research project has received ethical approval from the Human Ethics Committee of Victoria University of Wellington College of Education.

What do I need from you?

- Your permission to conduct my study at Glendale kindergarten.

AS THE MANAGER, YOU HAVE THE RIGHT:

- Decline the invitation to participate.
- To withdraw Glendale kindergarten from this study at any time.
- To ask any questions about the study at any time during the participation.
- To be given access to the summary of the findings when the study is completed.

If you have any questions concerning the Information Sheet, please feel free to contact me (463 9637), or my supervisor Dr Mary Jane Shuker at the School of Early Childhood Teacher Education, Victoria University College of Education (463 9637) for further information.

Yours sincerely

Lisa Terreni

Appendix B:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

INFORMATION SHEET [Teachers]

My name is Lisa Terreni and I am a Masters student in Education at Victoria University of Wellington College of Education. As part of this degree I am undertaking a research based thesis. I am also a lecturer and professional development facilitator for the School of Early Childhood Teacher Education and I work principally in the area of visual art education.

The purpose of my research is to find out what learning strategies children employ when they use an Interactive Whiteboard in their visual art learning experiences. I am also examining how teachers support the children in their use of the Interactive Whiteboard in this area and what type of existing knowledge and skills the children bring to this experience. My research is being supervised by Dr Mary Jane Shuker (Ph: 463 9659). I would like to invite you to take part in this study.

The study will involve:

1. An initial meeting with you and your colleagues to organise a timeline for the research.

2. Participant observations of the children and teachers using the Interactive Whiteboard and their engagement in the kindergarten's visual art programme. As a participant observer I will be recording them using field notes, video and digital photographs. The collection of data will be carried out over 4 consecutive weeks from 9am to 12:30pm.

3. Observations of a selected group of children (2 four year old boys and 2 four year old girls, 2 three year old boys and 2 three year old girls) as they engage with the Interactive Whiteboard in visual art learning experiences. You and your colleagues will be asked to assist in selecting the 8 focus children.

4. A focus group interview with you and your colleagues (1 initial focus group interview of 1 to 1 ½ hours, with discussions throughout the research gathering process).

5. Providing the teaching teams' documentation of the children using the Interactive Whiteboard while engaged in visual art learning experiences, for example, Learning Stories, photos and/or videos.

6. Interview the parents of the 8 selected children (1 focus group interview, and informal discussions throughout the research gathering process). It is anticipated that this will take 1 to ½ hours.

This research will take approximately one month, starting at the beginning of November 2007.

While complete anonymity cannot be guaranteed, complete confidentiality (no names will be used) will be assured to both the participants and the kindergarten during the course of the data gathering and observation stages. The information gathered from this study will be kept in a secure place and will be viewed only by my supervisor and myself, and destroyed after five years.

As teachers you have the right to ownership of the raw data. The teachers, children and parents involved in the study will have the right to check the data collected throughout the observation and interview gathering processes. A summary of the results will be made available on completion of the research project, and a meeting to discuss the findings of the research will be organised.

This research project has received ethical approval from the Human Ethics Committee of Victoria University of Wellington College of Education.

What do I need from you?

- Participate in an initial meeting with me to establish a timeline to undertake this research.
- Provide assistance with the distribution and collection of Information Sheets and Consent Forms to parents.
- Assist me to select 8 focus children (2 four year old boys and 2 four year old girls, 2 three year old boys and 2 three year old girls).
- Provide assistance with the distribution and collection of Information Sheets and Consent Forms to the parents of the selected 8 children.
- To inform me of any changes that may take place during the scheduled observation times.
- Provide documentation that relates to children's use of the Interactive Whiteboard in relation to their visual art learning experiences. For instance, Learning Stories, photos and/or videos.
- Permission to observe, photograph and/or video your interactions with children using the Interactive Whiteboard or when it is used in relation to visual art learning experiences.
- Participate in a focus group interview with you and your colleagues.
- Permission to tape the focus group interview and permission to have the recordings transcribed.

AS A TEACHER, YOU HAVE THE RIGHT TO:

- Decline the invitation to participate.
-
- Withdraw without having to give a reason up to and including the final point of data collection.

- To refuse to distribute the Information Sheets and Consent Forms and collect the Consent Forms.

- To refuse to be observed, photographed or videoed.

- Decline the provision of documentation.

- To be given a timeline, and be involved in the setting up of such a timeline.

- To discuss the data collected throughout the observation and interview gathering process.

- To ask any questions about the study at any time during your participation.

- To know that your name, the children and the name of your kindergarten will not be used.

- To be given access to the summary of the findings when the study is completed.

- To be given the transcripts, tape and video recordings, photographs and the samples of children's work, if requested.

If you have any questions concerning the Information Sheet, please feel free to contact Lisa Terreni (463 9637) or my supervisor Dr Mary Jane Shuker at the School of Early Childhood Teacher Education, Victoria University College of Education (463 9637) for further information.

Yours sincerely

Lisa Terreni

Appendix C:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

INFORMATION SHEET [Parent/caregiver]

My name is Lisa Terreni and I am a Masters student in Education at Victoria University of Wellington College of Education. As part of this degree I am undertaking a research based thesis. I am also a lecturer and professional development facilitator for the School of Early Childhood Teacher Education and I work principally in the area of visual art education.

The purpose of my research is to find out what learning strategies children employ when they use an Interactive Whiteboard in their visual art learning experiences. I am also examining how teachers support the children in their use of the Interactive Whiteboard in this area and what type of existing knowledge and skills the children bring to this experience. My research is being supervised by Dr Mary Jane Shuker (Ph: 463 9659). I am inviting your child to take part in this research.

The study will involve:

1. Participant observations of the children and teachers using the Interactive Whiteboard and their engagement in the kindergarten's visual art programme. As a participant observer I will be recording them using field notes, video and digital photographs. The collection of data will be carried out over 4 consecutive weeks from 9am to 12:30pm.

2. Interviewing your child's kindergarten teachers (1 initial focus group interview of 1 to 1 ½ hours, with discussions throughout the research gathering process).

3. Viewing the teachers' documentation of the children using the Interactive Whiteboard while engaged in visual art learning experiences. For example, Learning Stories, photos and/or videos.

4. Informal interviewing, photographing and/or videoing of a selected group of children (2 four year old boys and 2 four year old girls, 2 three year old boys and 2 three year old girls) as they engage with the Interactive Whiteboard in visual art learning experiences. The teachers will be asked to assist in selecting the 8 children.

5. Interview the parents of the 8 selected children (1 focus group interview, and informal discussions throughout the research gathering process). It is anticipated that this will take 1 to ½ hours.

This process will take approximately one month, starting at the beginning of November 2007.

While complete anonymity cannot be guaranteed, complete confidentiality (your child's name will be not be used) will be assured to both the participants and the kindergarten during the course of the data gathering and observation stages. The information gathered from this study will be kept in a secure place and will be viewed only by my supervisor and myself, and destroyed after five years. Analysis

of the data will be reported in written form, supported by visual documentation in the form of photographs and video. Permission for using specific visual documentation will be sought from the participants in the study.

As parents you have the right to the ownership of the raw data and the right to check the data collected throughout the observation and interview processes. A summary of the results will be made available on completion of the research project, and a meeting to discuss the findings of the research will be organised.

This research project has received ethical approval from the Human Ethics Committee of Victoria University of Wellington College of Education.

What do I need from you?

- Your written permission to allow your child to participate in this study.
- Your permission to collect samples of your child's work using the Interactive Whiteboard while engaged in visual art learning experiences.
- Your permission for your child to be photographed and/or videoed as he/she uses the Interactive Whiteboard while engaged in visual art learning experiences.
- Your permission to use photographs and/or videos of your child to support the written report of the findings from the study.

AS A PARENT/CAREGIVER, YOU HAVE THE RIGHT:

- To refuse to allow your child to participate in this study.
- To refuse permission for the collection of samples your child's work.
- To refuse permission for the taking of photographs and/or videos of your child using the Interactive Whiteboard.
- To withdraw your child from the study at any time.
- To ask any questions about the study at any time during your child's participation.
- To understand that your child's name will not be used.
- To understand that the name of your child's kindergarten will not be used.
- To be given access to the summary of the findings when the study is completed.

If you have any questions concerning the Information Sheet, please feel free to contact Lisa Terreni (463 9637) or my supervisor Dr Mary Jane Shuker at the School of Early Childhood Teacher Education, Victoria University College of Education (463 9637) for further information.

Yours sincerely

Lisa Terreni

Appendix D:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

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INFORMATION SHEET [Parent/caregiver of selected child]

My name is Lisa Terreni and I am a Masters student in Education at Victoria University of Wellington College of Education. As part of this degree I am undertaking a research based thesis. I am also a lecturer and professional development facilitator for the School of Early Childhood Teacher Education and I work principally in the area of visual art education.

The purpose of my research is to find out what learning strategies children employ when they use an Interactive Whiteboard in their visual art learning experiences. I am also examining how teachers support the children in their use of the Interactive Whiteboard in this area and what type of existing knowledge and skills the children bring to this experience. My research is being supervised by Dr Mary Jane Shuker (Ph: 463 9659).

I am interested in observing a selected group of eight children (2 four year old boys and 2 four year old girls and 2 three year old boys and 2 three year old girls) to enable me to observe children in more depth as they use the Interactive Whiteboard over a period of four consecutive weeks from 9am to 12:30pm. The teachers have assisted with the selection of the children and your child is one of them. I would like to invite your child to be one of the focus children in my study.

The study will involve:

1. Participant observations of children and teachers at your child's kindergarten using the Interactive Whiteboard and their engagement in the kindergarten's visual art programme. As a participant observer I will be recording them using field notes, video and digital photographs.

2. Interviewing your child's kindergarten teachers (1 initial focus group interview of 1 to 1 ½ hours, with informal discussions throughout the research gathering process)

3. Viewing the teachers' documentation of the children using the Interactive Whiteboard while engaged in visual art learning experiences. For example, Learning Stories, photos and/or videos.

4. Informal interviewing, photographing and/or videoing of your child and the other selected children as they engage with the Interactive Whiteboard in visual art learning experiences.

5. Interview with you and the other parents of the selected group of children (1 focus group interview, and informal discussions throughout the research gathering process). It is anticipated that the focus group interview will take 1 to ½ hours.

This process will take approximately one month, starting at the beginning of November 2007.

While complete anonymity cannot be guaranteed, complete confidentiality (your child's name will be not be used) will be assured to both the participants and the kindergarten during the course of the data gathering and observation stages. The information gathered from this study will be kept in a secure place and will be viewed only by my supervisor and myself, and destroyed after five years. Analysis of the data will be reported in written form, supported by visual documentation in the form of photographs and video. Permission for using specific visual documentation will be sought from the participants in the study.

As parents you have the right to the ownership of the raw data and the right to check the data collected throughout observation and interview gathering processes. A summary of the results will be made available on completion of the research project, and a meeting to discuss the findings of the research will be organised.

This research project has received ethical approval from the Human Ethics Committee of Victoria University of Wellington College of Education.

What do I need from you?

- Your written permission to allow your child to participate in this study.
- Your permission to collect samples of your child's work using the Interactive Whiteboard while engaged in visual art learning experiences.
- Your permission for your child to be photographed and/or videoed as they use with the Interactive Whiteboard while engaged in visual art learning experiences.
- Your permission to use photographs and/or videos of your child to support the written report of the findings from the study.
- Your permission to participate in a focus group interview with the other parents of the selected focus children.
- Permission to use a tape recorder at this focus group interview and have the tape recording transcribed.

AS A PARENT/CAREGIVER, YOU HAVE THE RIGHT:

- To refuse to allow your child to participate in this study as one of the focus children.
- To refuse permission for the collection of samples of your child's work.
- To refuse permission for the taking of photographs or videos of your child using the Interactive Whiteboard while engaged in visual art learning experiences.
- To withdraw your child from the study at any time.

- To ask any questions about the study at any time during your child's participation.

- To understand that your child's name will not be used.

- To understand that the name of your child's kindergarten will not be used.

- To be given access to the summary of the findings when the study is completed.

- To refuse permission to be part of the focus group interview.

- To refuse permission to have the focus group interview taped and have the tape recording transcribed.

If you have any questions concerning the Information Sheet, please feel free to contact Lisa Terreni (463 9637) or my supervisor Dr Mary Jane Shuker at the School of Early Childhood Teacher Education, Victoria University College of Education (463 9637) for further information.

Yours sincerely

Lisa Terreni

Appendix E:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

CONSENT FORM [Manager, Hutt City Kindergarten Association]

□ I have read the Information Sheet and I understand the contents. I understand that I may ask questions at any time.

□ I agree to allow Glendale kindergarten to participate in this study.

□ I understand that I have the right to withdraw Glendale kindergarten from the study at any time in which case any data I have provided will be destroyed.

□ I also understand that parents/caregivers have the right to any examples of their children's work that has been collected during the course of the study.

□ I understand that the teachers involved in the study have the right to discuss the data collected throughout the observation and interview gathering process.

I agree:

□ To give permission to Lisa Terreni to undertake a research study at Glendale kindergarten under the conditions provided in the Information Sheet.

NAME OF MANAGER **:** _____

SIGNATURE **:** _____

DATE **:** _____

Appendix F:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

CONSENT FORM [Teachers]

□ I have read the Information Sheet and I understand the contents. I understand that I may ask questions at any time.

□ I understand that I have the right to withdraw from the study at any time in which case any data I have provided will be destroyed.

□ I also understand that parents/caregivers have the right to any raw data collected about their child.

□ I understand that as one of the teachers involved in the study, I have the right to discuss the data collected throughout the observation and interview gathering process.

I agree:

□ To assist in the distribution of the Information Sheets and Consent Forms and the collection of Consent Forms from the parents of the children at Glendale kindergarten.

□ To participate in an initial meeting to establish a timeline for undertaking the research which best suit the kindergarten.

□ To provide Lisa Terreni of any changes which may take place during the scheduled participant observation times.

□ To provide Lisa Terreni with documentation that relates to the children's use of the Interactive Whiteboard in relation to their visual art learning experiences, for example Learning Stories, photographs and/or videos.

□ To give permission to Lisa Terreni to observe, photograph and/or video my interactions with children using the Interactive Whiteboard in relation to visual art learning experiences.

□ To participate in a focus group interview with the other members of the teaching staff.

□ To give permission for the focus group interview to be taped and to have the tape recording transcribed.

□ I agree to participate in the study under the conditions in the Information Sheet and on the understanding that my name will not be identified.

NAME OF TEACHER : _____

SIGNATURE : _____

DATE : _____

Appendix G:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

CONSENT FORM [Parent/caregiver]

□ I have read the Information Sheet from Lisa Terreni and I understand the contents. I understand that I may ask questions at any time.

□ agree to allow my child to participate in this study.

□ I understand that I have the right to withdraw my child from the study at any time in which case any data I have provided will be destroyed.

□ I understand that as a parent/caregiver I have the right to any raw data collected about my child, for instance, the copies of his/her work, photographs or video footage.

I agree:

□ To allow my child to participate in the study.

□ To the collection of samples of my child's work.

□ To allow photographs and video to be taken of my child using the Interactive Whiteboard while engaged in visual art learning experiences.

□ To allow samples of my child's work, photographs and/or video to be used to support the final written report.

□ I agree to for my child to participate in the study under the conditions in the Information Sheet.

PARENT/CAREGIVER 1	**PARENT/CAREGIVER 2**
Name: _____	**Name:** _____
Signature: _____	**Signature:** _____
Date:_____	**Date:**_____

Appendix H:

VICTORIA UNIVERSITY OF WELLINGTON
Te Whare Wananga o te Upoko o te Ika a Maui

A case study of how young children and teachers use an Interactive Whiteboard in a kindergarten setting for visual art learning experiences.

CONSENT FORM [Parent/caregiver of selected child]

□ I have read the Information Sheet from Lisa Terreni and I understand the contents. I understand that I may ask questions at any time.

□ I agree to allow my child to participate in this study.

□ I understand that I have the right to withdraw my child from the study at any time in which case any data I have provided will be destroyed.

□ I understand that as a parent/caregiver I have the right to any raw data collected about my child, for instance, the copies of his/her work, photographs or video footage.

□ I agree to participate in a focus group interview with the parents of the other selected children.

□ To allow the focus group interview to be tape recorded and the tape recording transcribed.

I agree:

□ To allow my child to participate in the study as one of the 8 focus children.

□ To the collection of samples of my child's work.

□ To allow photographs and video to be taken of my child using the Interactive Whiteboard while engaged in visual art learning experiences.

□ To allow samples of my child's work, photographs and/or video to be used to support the final written report.

□ To participate in a focus group interview with the other parents of the selected focus children.

□ I agree to participate in the study under the conditions in the Information Sheet.

PARENT/CAREGIVER 1	**PARENT/CAREGIVER 2**
Name: _____	**Name:** _____
Signature: _____	**Signature:** _____
Date:_____	**Date:**_____

Appendix I:

INFORMATION AND SUGGESTED GROUND RULES FOR A GROUP INTERVIEW – Teachers

INFORMATION

A group interview can take the form of a relaxed, non-threatening discussion with a number of people, the purpose being to obtain perceptions on a defined topic/area. The group interview is coordinated by the researcher (Lisa Terreni) who interacts with the participants, asks the questions and encourages sharing of ideas between the participants. Group members can add to, and respond to others' comments and hence influence the ideas of others.

Participants usually share some commonality with regard to the topic, and most people feel more comfortable when disclosing material to people who resemble themselves or who have shared similar experiences.

The discussion is either taped or a note taker records the key points of the discussion and confirms the accuracy of these at the conclusion of the interview. Sometimes sessions are video recorded.

Objective of the Meeting

The objective of this group meeting is to discuss issues, ideas, and personal and group reflections about the use by the teachers and children of the Interactive Whiteboard at Glendale Kindergarten in relation to visual art learning experiences.

The Planning for the Session

A number of questions have been appended to this information sheet. These will form the basis of the discussion between the group members. Members can of course raise any other pertinent issues at the end of the discussion when 'any other comments' are called for.

It is important that participants agree upon a number of ground rules for the meeting. A suggested list of ground rules are appended to this information sheet.

Notes of the interview will be recorded by the researcher during the interview. These will be read back to the group at the conclusion of the interview to check for accuracy.

A tape recording of the session will also take place. Members will receive a transcript of the tape records for verification.

Members will receive a copy of the report of findings after the material has been analysed.

SUGGESTED 'GROUND RULES' FOR FOCUS GROUP INTERVIEW

1. It is important that all of your co-participants contribute to the discussion. Do assist others to contribute if you feel this is appropriate.

2. Keep focused on the question that is being asked. Frequently look at the question to keep you on this task.

3. Try to keep the meeting moving by being succinct - but do give all relevant information. The time frame will give you an idea about how much time to spend on each question but, if necessary, another meeting can be convened to gather further information.

4. The researcher (Lisa Terreni) will attempt to obtain a closure on each answer to the question – no one should feel that they have important ideas not discussed.

5. All participants need to agree that as a general rule discussion points are confidential to participants. No names or identification of the children and the kindergarten are to occur in any subsequent discussions.

Use of the Interactive Whiteboard - GROUP QUESTIONS

- What type of visual art programme/education does the kindergarten offer? For example, how is the kindergarten environment set up and what types of resources are provided? What level of adult involvement, support and teaching occurs in this domain?

- Is there a history of ICT use in the kindergarten's visual art programme?

- What ICT training did the teachers undertake to become au fait with the capabilities of the Interactive Whiteboard, specifically in the visual art area?

- What software, applications and multi-modal uses of the Interactive Whiteboard are the teachers aware of in relation to using with the Interactive Whiteboard in the visual art?

- Are the teachers fully competent users themselves of these tools?

- How do the teachers see the children (individually and in groups) use the Interactive Whiteboard in relation to their visual art learning?

- Do children utilise the programmes and software independently or with peer and/or teacher support?

- What software applications do children prefer and which appear to be the most user-friendly in relation to their visual art explorations?
- Is the Interactive Whiteboard integrated into the visual art programme and used as another art tool by the children?

- What specific examples of children's learning using the IWB have teachers observed in relation to their visual art learning experiences?

- Do teachers and parents believe that the use of the Interactive Whiteboard has made children feel more confident and competent relation to the visual art?

- Has the use of the Interactive Whiteboard in relation to the visual art changed teachers and parents understandings of how ICT can be a tool for creativity and learning in this domain?

- Any further comments?

Appendix J:

INFORMATION AND SUGGESTED GROUND RULES FOR A GROUP INTERVIEW – Parents of the 8 selected focus children

INFORMATION

A group interview can take the form of a relaxed, non-threatening discussion with a number of people, the purpose being to obtain perceptions on a defined topic/area. The group interview is coordinated by the researcher (Lisa Terreni) who interacts with the participants, asks the questions and encourages sharing of ideas between the participants. Group members can add to, and respond to others' comments and hence influence the ideas of others.

Participants usually share some commonality with regard to the topic, and most people feel more comfortable when disclosing material to people who resemble themselves or who have shared similar experiences.

The discussion is either taped or a note taker records the key points of the discussion and confirms the accuracy of these at the conclusion of the interview. Sometimes sessions are video recorded.

Objective of the Meeting

The objective of this group meeting is to discuss issues, ideas, and personal and group reflections about the use by the teachers and children of the Interactive Whiteboard in relation to visual art learning experiences at Glendale Kindergarten.

The Planning for the Session

A number of questions have been appended to this information sheet. These will form the basis of the discussion between the group members. Members can of course raise any other pertinent issues at the end of the discussion when 'any other comments' are called for.

It is important that participants agree upon a number of ground rules for the meeting. A suggested list of ground rules are appended to this information sheet.

Notes of the interview will be recorded by the researcher during the interview. These will be read back to the group at the conclusion of the interview to check for accuracy.

A tape recording of the session will also take place. Members will receive a transcript of the tape records for verification.

Members will receive a copy of the report of findings after the material has been analysed.

SUGGESTED 'GROUND RULES' FOR FOCUS GROUP INTERVIEW

1. It is important that all of your co-participants contribute to the discussion. Do assist others to contribute if you feel this is appropriate.

2. Keep focused on the question that is being asked. Frequently look at the question to keep you on this task.

3. Try to keep the meeting moving by being succinct - but do give all relevant information. The time frame will give you an idea about how much time to spend on each question but, if necessary, another meeting can be convened to gather further information.

4. The researcher (Lisa Terreni) will attempt to obtain a closure on each answer to the question – no one should feel that they have important ideas not discussed.

5. All participants need to agree that as a general rule discussion points are confidential to participants. No names or identification of the children and the kindergarten are to occur in any subsequent discussions.

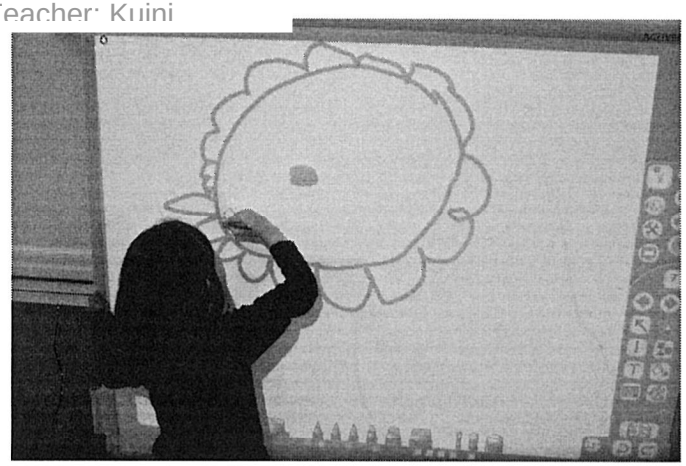
Use of the Interactive Whiteboard - GROUP QUESTIONS

- Does your child engage in the kindergarten's visual art programme?
- What do you think about the art programme that is provided at the kindergarten?
- Have you noticed the teachers use ICT in the kindergarten's visual art programme? For example using e books, Learning Stories, and so forth?
- Have you seen the children use the Interactive Whiteboard?
- How do you feel about this new technology?
- Have you seen your child use the IWB?
- What have you noticed when your child or children use the IWB?
- What do you think they learn from this experience?
- Do you think your child brings any knowledge, skills or experience from home to his/her use of the Interactive Whiteboard, particularly in relation to visual art learning experiences?
- Do you believe that the use of the Interactive Whiteboard has made children feel more confident and competent in relation to the visual art?
- Has the use of the Interactive Whiteboard in relation to the visual art changed your understandings of how ICT can be a tool for creativity and learning in the visual art?
- Any further comments?

Appendix K

Rachel's Flowers

Teacher: Kuini

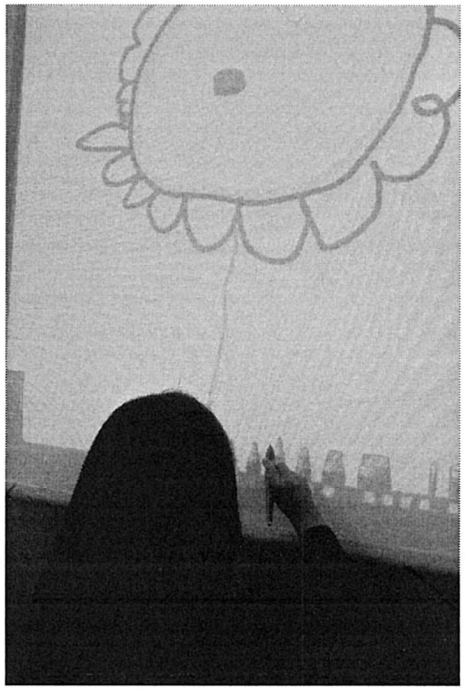


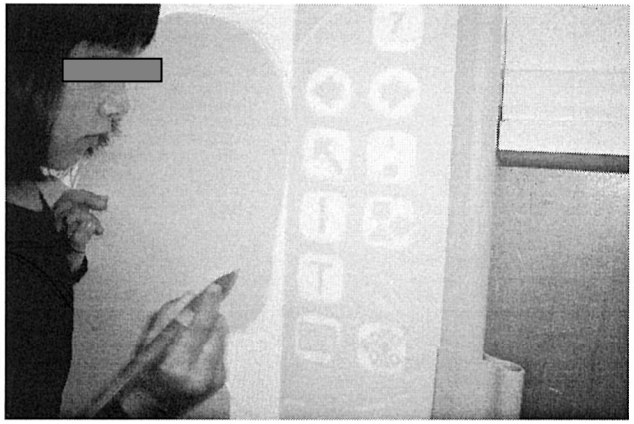
I never realised what a perfectionist you are Rachel. You have been exploring the Activ board each day. You have been practicing your technique for drawing flowers.

This is your second attempt at drawing a flower today.

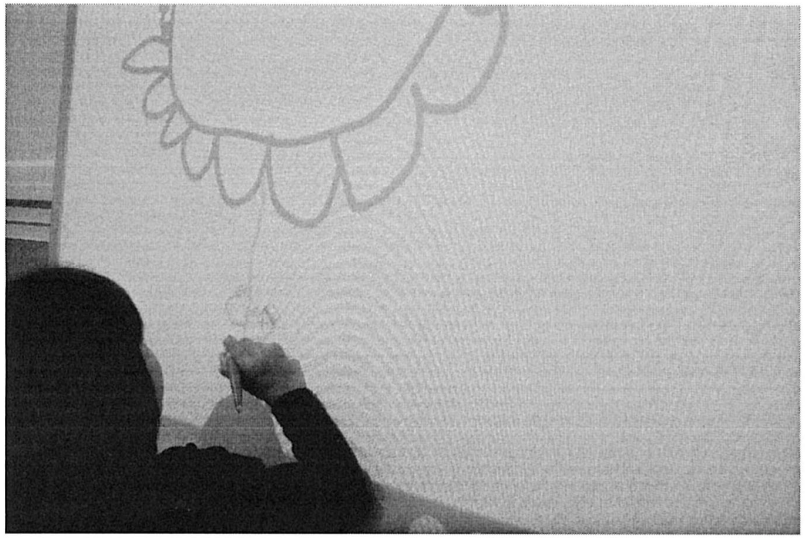
The first attempt didn't satisfy you at all.

It was the stem. It wasn't the length you wanted it to be, you had run out of space on the Activ board.



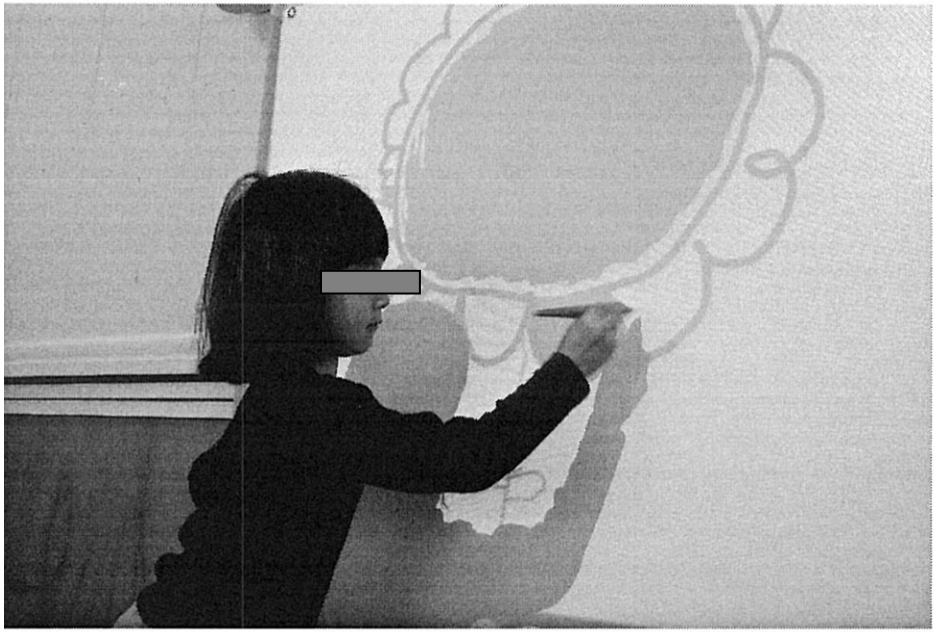


Now you are trying some new icons & discovering there functions.



When you draw with the pen I see you prefer the rubbing out option.

Maybe you feel it gives you more control.

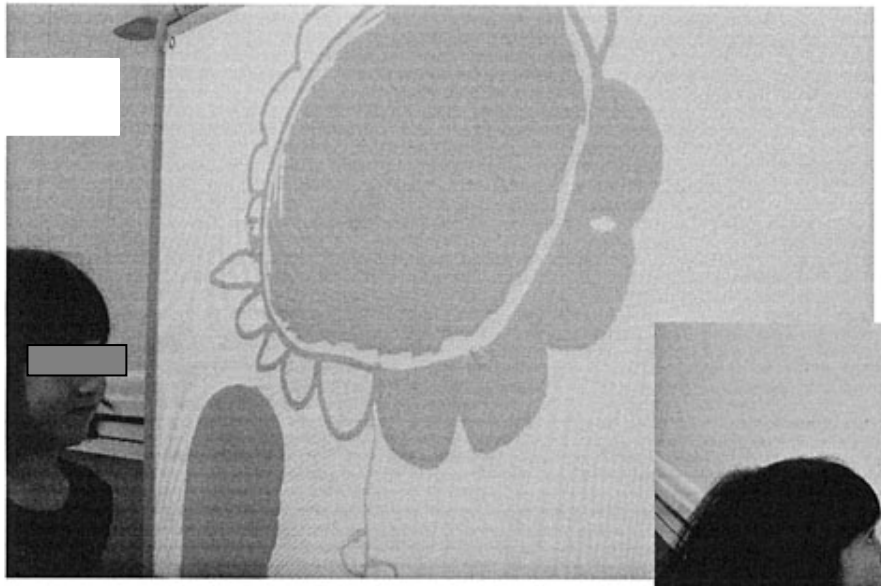


"That's not right" You say under your breath.
You quickly remedy the filled in background by tapping the undo option.

1 tap and all is restored to how it was before.

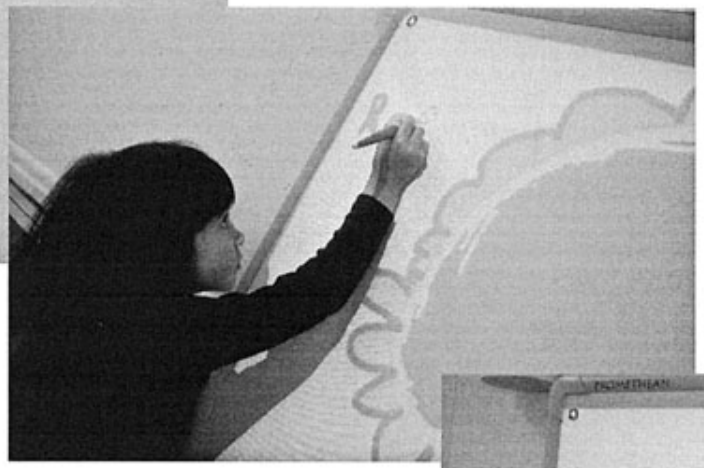
Now you ensure your tap of the pen hits exactly the right spot, right in the middle of each petal.

I see you want each petal to be a different colour.



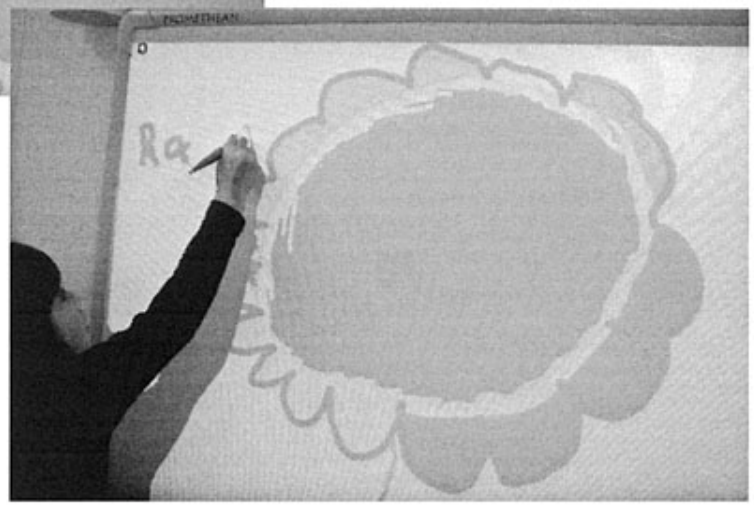
When you begin to write your name you are stopped in your tracks.....
There isn't enough space.

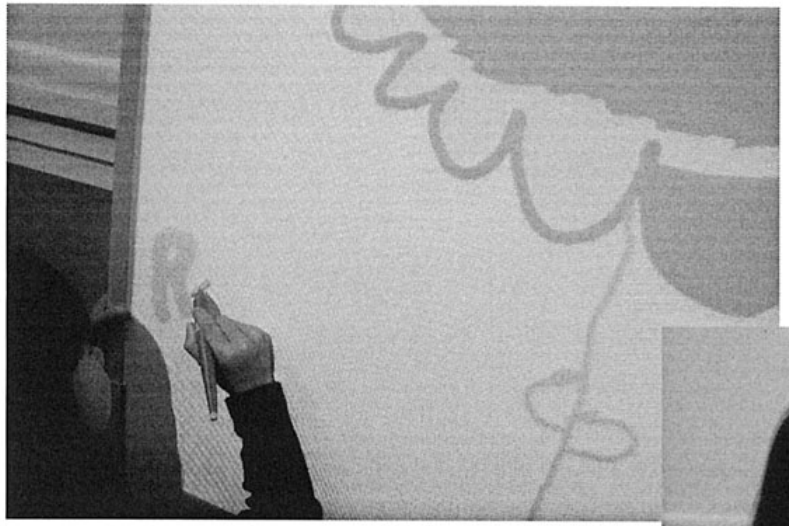
Now that's a satisfied expression if ever I have seen one.



You start to write your name.
"Oh no" you say.

Selecting the rubber, you rub your name out.



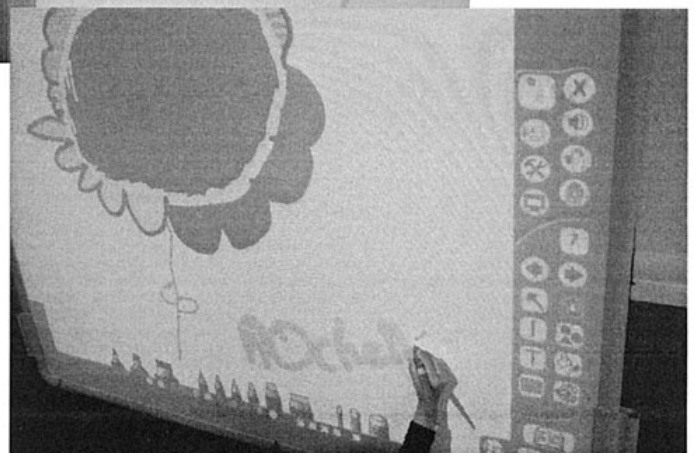


"There may be more space t the bottom Rachel?" I suggested.
"Hmmm..." you say.

All most Rachel.
"I can't fit e now I have to find another space"

"Try on this side" I suggested again.

Perfect Rachel Perfect!



You quickly saved your work. We did the first save together and then you continued to work through the saving sequence yourself. It is a 4 step sequence.
"I want to show Mum when she comes back"

"Shall we look at some other flowers? I asked.

"These are like my ones at home" Rachel shared.

"That's yellow Quini"
"Mmm that flower will turn into a tomato. But only if a Bee pollinates it"
I shared.

Then we found some tiny green tomatoes.

These are going to turn into strawberries aren't they Quini"

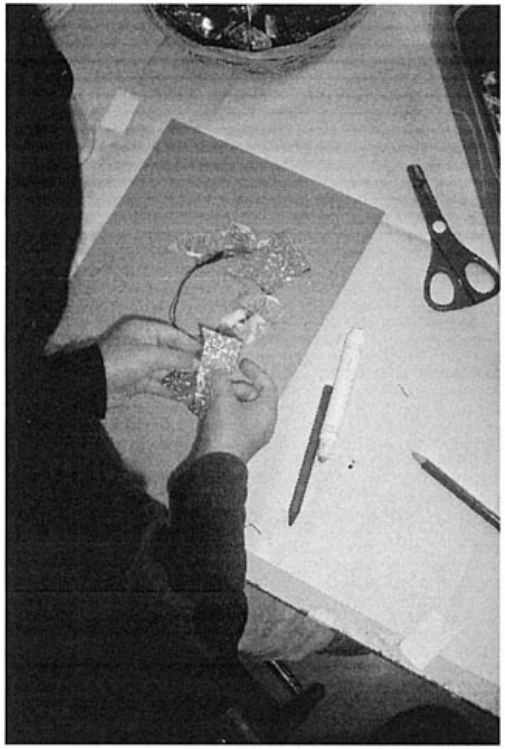
Then Rachel spotted some flowering Puha.

I shared with Rachel that Chico our rabbit loves these flowers & leaves.

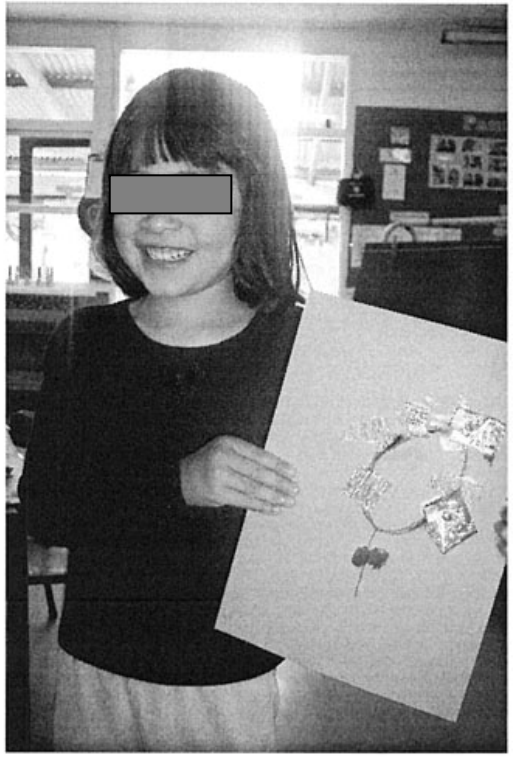
We pick some fresh juicy Puha and Chico gobbled then up.

Later I noticed you at the collage table.

You had organised the resources around you. Glue, Scissors, baskets of coloured cellophane and cardboard.



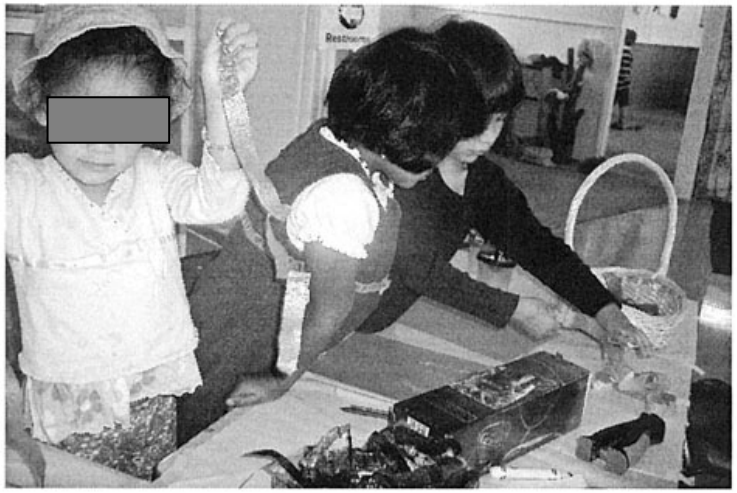
I'm so glad the camera has a good zoom in. I couldn't believe it Rachel. You are recreating a flower that resembles the one you drew on the Activ board earlier. I haven't seen you make petals this way before.



Hmm this is becoming a familiar expression.

It's that same radiating glow

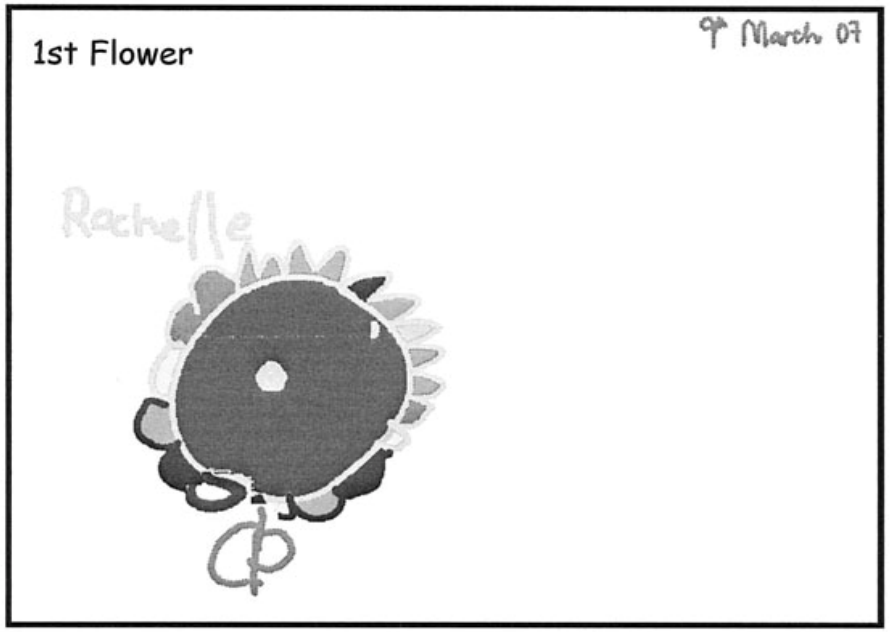
of pure satisfaction about your work.

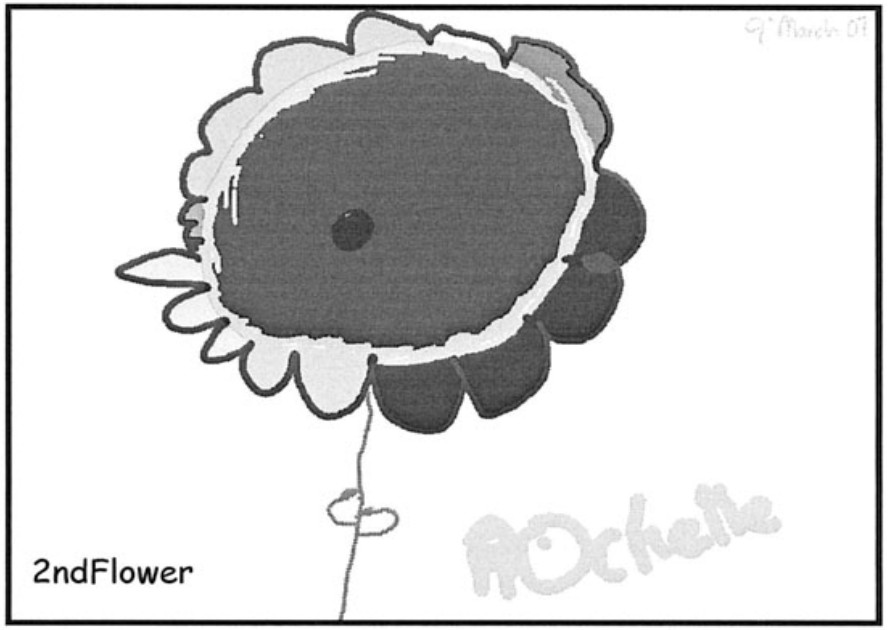


Visha noticed your work,
"Can you show me how to make it Rachel?"

Now you are sharing your expertise with others.

Villa watches closely as Rachel demonstrates attaching the cellphane petals.





What learning is happening here?

Recognising

-Rachel you are so diligent, I've never noticed before that you are a perfectionist. I like how you discovered that the Activ board can be used to test & tryout what you are thinking. What was equally exciting was that you went on to then make a flower at the craft table. Recreating the colourful petals from the Activ board with your card & cellophane.

-You were so keen to share the style of collage you tried today, when Villa asked you were only to willingly to share your ideas & work and to teach Visha the technique you were using.

- I can also see Rachel that you quietly relish achieving a high level of satisfaction, the expression on your face is says how proud you are of yourself (perhaps).

-You enjoy so many aspects of attending kindergarten Rochelle, from Baking chocolate cakes to dancing with Miss

Stephanie to using the new Activ board and your most favourite passion is working at the craft table.

What are the opportunities & possibilities

Responding

-I wonder why Rachel enjoys flowers so much? I wonder if there are other possibilities here, what other ways can flowers be created, clay, play dough, paper mache, wire the possibilities are huge. We can try some of the new ideas at kindy.

-Rachel does enjoy sharing the ideas & techniques she learns, she really is very humble and voluntarily offers her skills when asked by other children.

-Reading Rachel's last learning story I have discovered that developing these leadership skills can continue here as well, with her friends at kindy.

-On the Activ Board children are encouraged to save their work independently, it is a 4-5 step sequence to remember. Rachel has fast become the expert and I often ask her if she would like to show others how to save their work and she quietly shows them the process, (Thanks Rachel)

Hi Mark & Grace

I hope you enjoy reading through Rochelle's latest adventures at kindy. Like I have mentioned before I never realised that Roachel is a perfectionist. Please share your thoughts

_____

_____

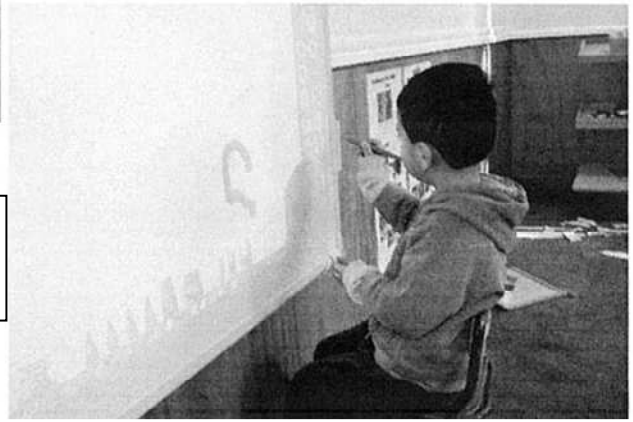
Thank you

Appendix L

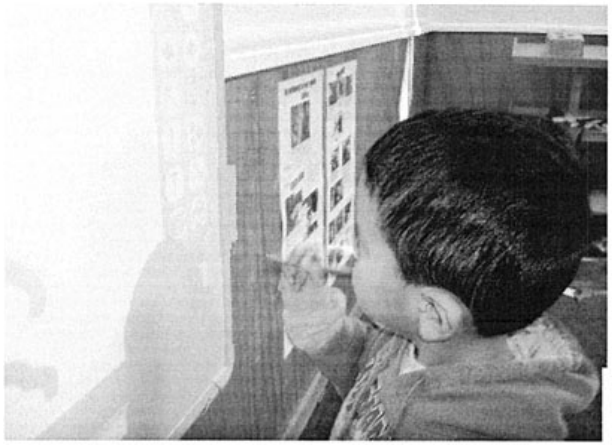
Teacher Kathy / Marko 3 years 7 months

It is wonderful we can offer the Activ Board to the afternoon children now, as the older children role model to the younger children. Things like hanging up their name to wait for a turn.

Marko after watching other children drawing on the Activ board, you are adamant about having a turn. So I suggest you hang up your name under the numbers.

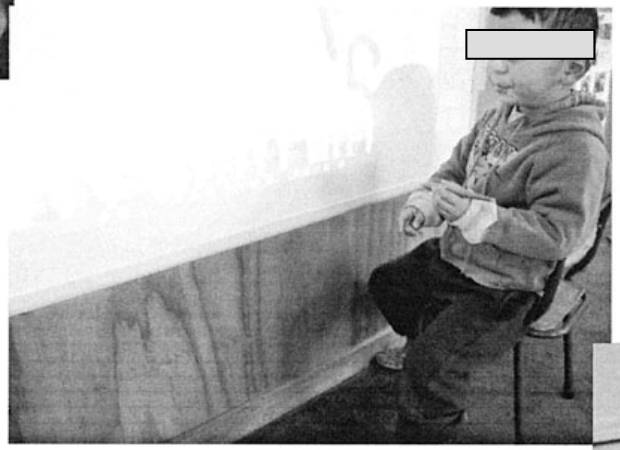


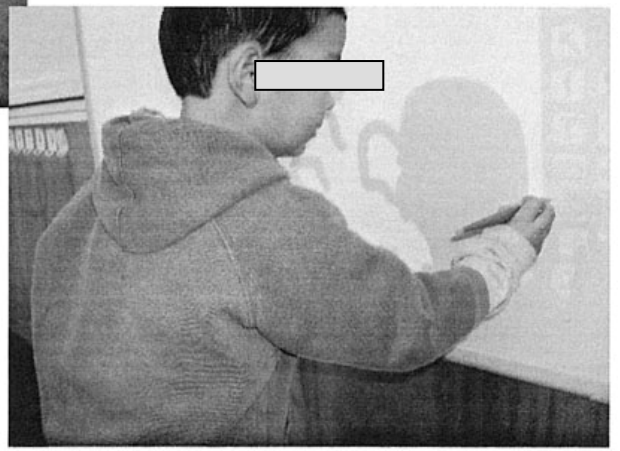
Then it is back to business, as you eagerly take the pen ... and tap on a colour. Marko you smile when your picture finally appears, as it's like magic. After drawing one squiggly line, you try another, then another.



Before taking a good look at all the various icons down the right hand side. Don't worry Marko, I am still discovering what some icons do, but at least you know where the pencil icon is and how to change colours.

Which is great, as this gives you an opportunity to try every colour, while practicing.





Well Marko the Activ board certainly has you mesmerised as you watch every move you make, including details like how you hold the pen, as you experiment with shape and colour.

Marko it is intriguing to watch, as your drawings slowly creep up the board, as it is wonderful to have so...oo much space to move. This certainly strengthens your upper body Marko, because you are intent on reaching the top of the board. Wow what determination.

Marko, I think it is great you can experiment with the active board, as I notice your movements are becoming freer, with each stroke. Marko, I enjoy watching your work creep up the board,as you realize, there is a space. Unlike small pieces of paper that can restrict your flow.

Marko I am excited your picture was saved to the Laptop, as I can include it into this story, for all your whānau to see, because you enjoyed investigating what you can do with the Activ board.

What Learning is Happening Here?

Recognising

Marko you certainly enjoy the Activ board, and you are comfortable to have a go, even sussing out the icons down the side. I wonder if you use a computer at home? However today you are content on drawing and trying different techniques, like dots or squiggly lines, while experimenting with different colours. Marko isn't it exciting how quickly you can change colours with a tap of a pen, no wonder you quickly master this skill, but Marko it is also your persistence to continue to practice, that enables you to be successful. Marko this disposition will certainly assist you in future learning, as you strive to master new skills and techniques, so I won't be surprised when you teach me something new about the Activ board.

What are the Opportunities & possibilities Here?

Responding

Hey Marko, I think today is just the beginning for your fascination for the Activ board, as you already show a keen interest in the other icons and I know you will persist with a task until you achieve satisfaction. Whether it be gaining Kuini 's or my attention or achieving a goal like mastering the fill icon, as this certainly adds colour to your pictures. Marko I have a challenge for you maybe next time you draw a picture on the Activ board, you could attempt to save it yourself, with a little guidance, as I think you are capable to do this. What do you think?

Appendix M

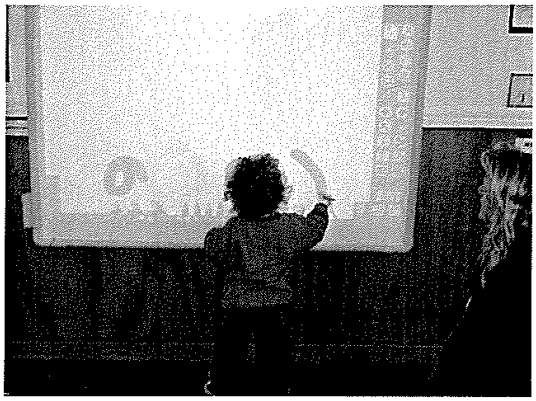
Michelle's Drawing

7 December 2007

Tea '

7th December 2007

Noticing



Today I saw you at the Activ-board Michelle. You were drawing on the board with the pen. "Red" said Martha. Next minute you drew a circle. "Purple" you said. "That's right Michelle. Purple circle" Said Martha. Martha went outside to help Tanya.

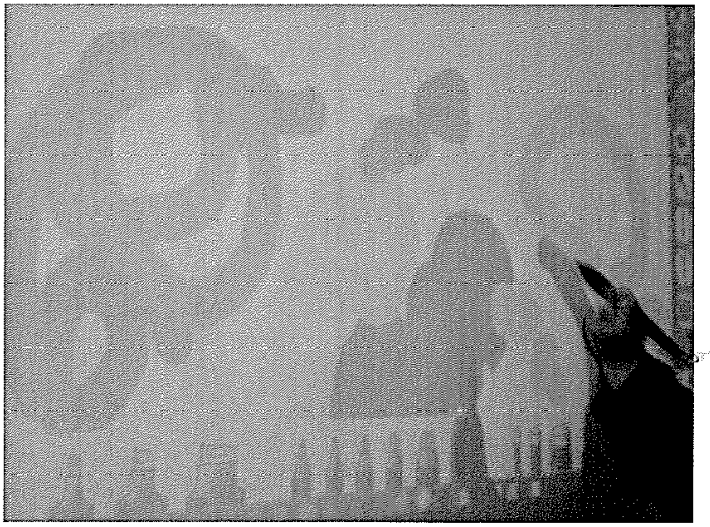
You drew another red circle. I noticed that you switched the pen to your left hand. I heard you say 'yellow' to yourself. One more tap on the thick red pencil and you were ready to draw. "Oh no." you said.
"Did you not like red." I asked.
"I want yellow." you replied.
I showed you the little circles of different colours at the bottom of the screen.

"Tap on the yellow one Michelle." I said. I looked away for a minute and I heard this exciting voice, "Look, Look Surija!." "Oh you did it! You got your yellow" I replied. I brought to your notice that the pencils change colour when you tap on the colour you want.

Noticing

I wonder what colour you are going to choose next?" I thought to myself Michelle when I saw you looking at the colours carefully. You tap on the orange. "Oh no. It is yellow" you said.
"Tap again. Harder. Look Michelle. The pencils are orange now" I showed you.

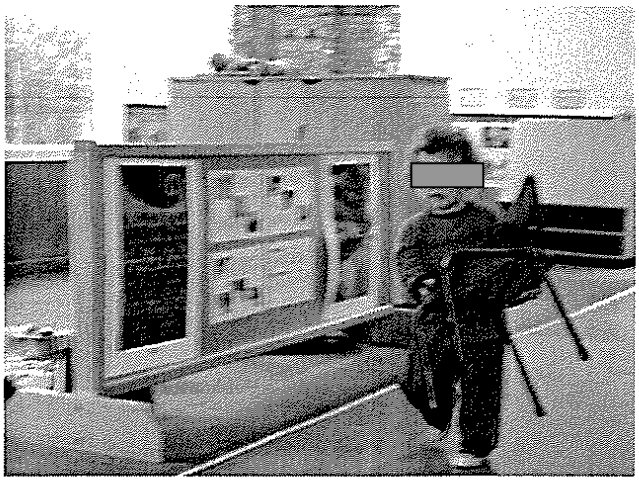
When you finished drawing a random shape with the thick orange pencil, you accidentally clicked on the rubber icon. You were really amazed to watch the orange colour disappear in front of your eyes. It was like magic Michelle wasn't it?



Noticing

Michelle you used so many different colours in your picture. Red, yellow, green, orange and black. Every time you tapped the colour button, the pencils changed colour and I heard you say the mane of the colour out loud.

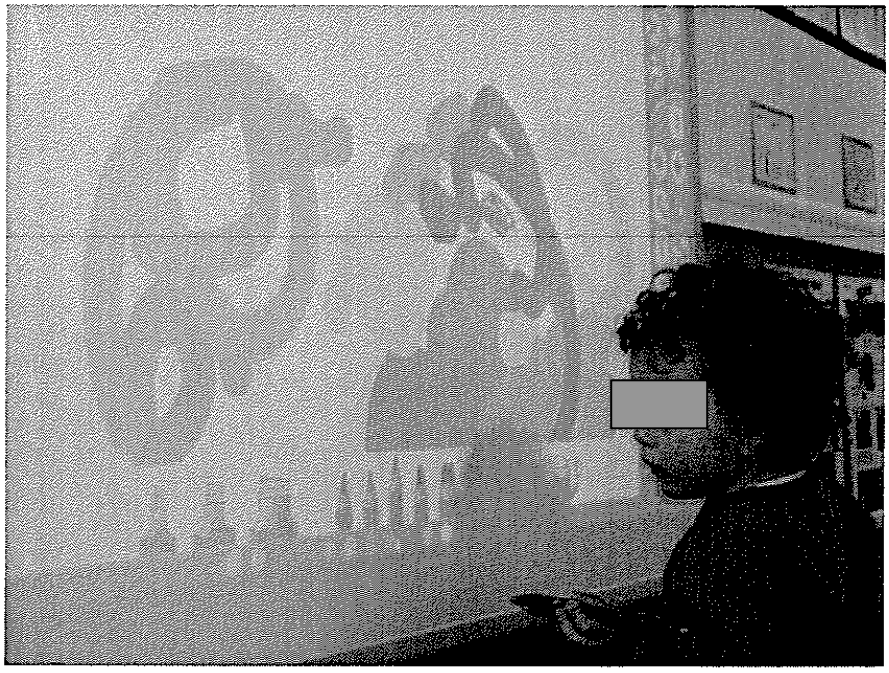
I could see a beautiful pace of art emerging.
"Hi Michelle, that looks like a green butterfly" I said. The pencils turned black and black colour appeared under the butterfly. Next minute the black was gone.



There wasn't enough space left on the active board for you to draw. You quickly walked over to the writing table to get a chair, may be to stand on.

Noticing

Michelle you tried standing on the chair so that you could reach the top of the Activ board, but felt a bit uncomfortable.



You decided to use the chair to sit on. I had to go and do something else. When I left you were busy creating your masterpiece using the magic of the pen, one click and the colour of the pencils changes.

What Learning is Happening Here?

Recognising

- Michelle you show great interest in the active board. Every day I find you at least once near the active board. When it is not your turn on the active board, you watch the other children use the various icons on it.
- Today you were really excited to discover that the pencils change colour when you tap on a particular colour.
- Michelle you spent quite a bit of time testing your discovery. This is the best way to learn new things. "Trying things out, exploration and curiosity are important and valued ways of learning" (Te Whāriki, p 84)
- You were really involved in your drawing and left no stone unturned to finish it. For e.g. you got the chair to stand on to reach the top of the active board.
- Michelle you were fascinated by the rubber and how it works on the active board.

What are the Opportunities & Possibilities?

Responding

Michelle the possibilities are endless, this is just a start. There are lots more to learn and discover about the active board, its functions and the icons. I am still finding new things on it every day. Maybe you could teach me something new one day.

Appendix N

Smile you're on Candid Camera

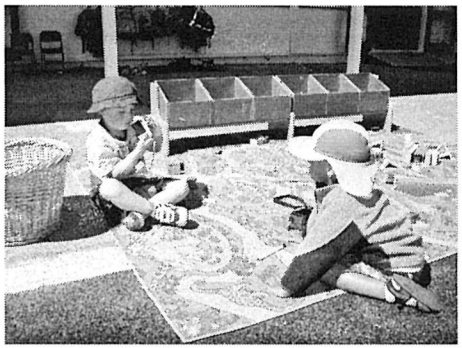
Today Brian you notice me using my camera and ask if you can have a turn. I hesitate for a few seconds because I have only had the camera this term and it is quite precious to me. I want to hold the camera with you, but this does not meet with your approval and you quickly and quite rightly tell me to let go with a firm voice. I decide to trust you so pass the camera to you.

Teacher; Martha

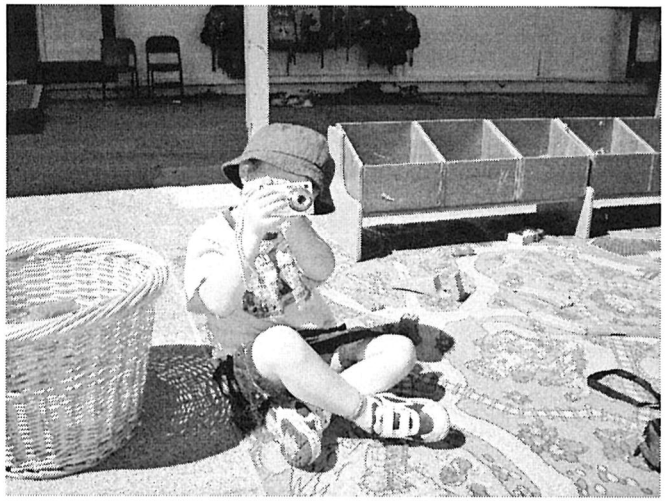
December 2007

First you scrutinize all the dials at the back of the camera then spot the viewing frame. "Wow I can see you Martha and I can see your nose" you say moving the camera quite close to my face. 'I can see Adam to and the railway track'. Again you move the camera close to and away from the track "This is cool Martha I have to get me one tomorrow." Next you discover the button at the top of the camera and press it. This retracts the lense. 'Hey I can't see anything" you announce with quite a surprised voice. You press the button again and realize the lense is released so you can look through it again .

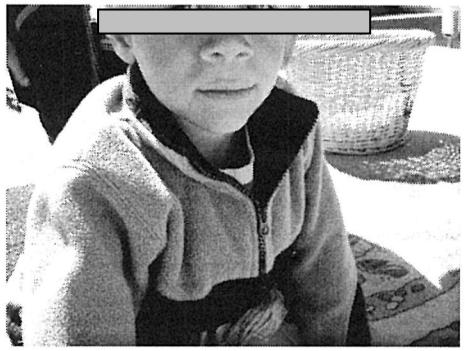
I ask you Brian if you would like to take photo of Alex and demonstrate how to use the camera. "Can I see it you ask?" after taking the photo. I decide to seek Kathy's help because I have forgotten which is the review button.



This button is very small so it took a lot of practice to press it. However you are very determined to master this skill and have several goes until you are successful. Kathy also explains about the arrow keys to review several photos. This wetted your appetite . Then you pretend to be a professional photographer taking a series of shots in succession. "Hey I'm superman" you say moving the Camera a quickly from side to side making very effective sound effects of the lense opening and closing.



Broadie would you like to take my photo I ask? We work together for a while so you can learn how to hold the camera still and at the correct position to focus on the image . This can be quite tricky even for adults . Your enthusiasm did not dwindle even though it was hard to remember to keep the camera upright when you press the button to take a shot. Patience is a great virtue and you persevered to achieve capturing almost all of mine and Alex's head and upper body Well done ..



What Learning is Happening Here

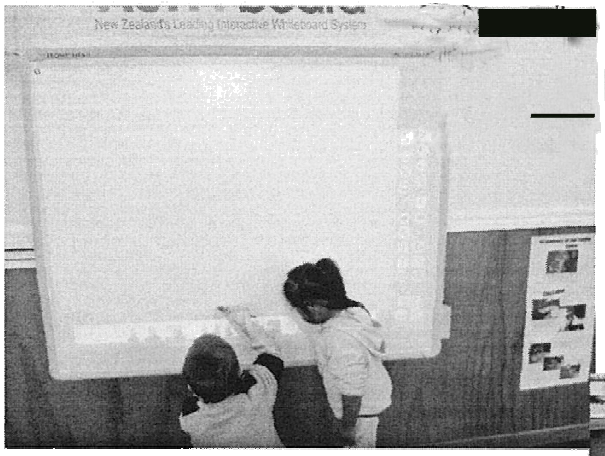
Brian I was fascinated with the extent of your concentration while observing you explore how to operate the camera. You were such a good role model for me very determined to master the challenge you set for yourself not giving up or showing any frustration or fear of failure when things didn't work out immediately. Brodie you were fully absorbed in the moment and wanted to make the most of the opportunity to find out how to use the camera. If anyone came near you held onto the camera tightly and were quick to tell them you were having your turn. I was amazed just how quickly and independently you grasped the concepts of the functions of the camera lense. Sharing this learning experience with you has also been a good reminder to me of just how difficult it can be at kindergarten to share something valuable that you are really interested in and want to learn more about without being interrupted..

Brian I'm wondering if all the work Lisa has been doing with the children has stimulated your awareness of the fun and possibilities in using one of the tools of technology. 1have not seen you use the interactive board very often at kindergarten and Lisa has also confirmed this. She has suggested that we could down 1oad the photographs of this learning story onto the active board which I'm quite excited about. I'm sure that you will enjoy seeing your self on the big screen and I would really like to share with you your story, thoughts and ideas about the photographs. The Kindergarten association has also informed us that they are purchasing some digital cameras for children to use. I think you may be one of the first children in the queue. While we are waiting another good suggestion from Lisa is to purchase a neck strap for the camera which will alleviate some of the anxiety associated with the possibility of damage when sharing my camera with children. There is still lots to explore but you have made a fantastic start.

Appendix 0

Teacher: Kathy

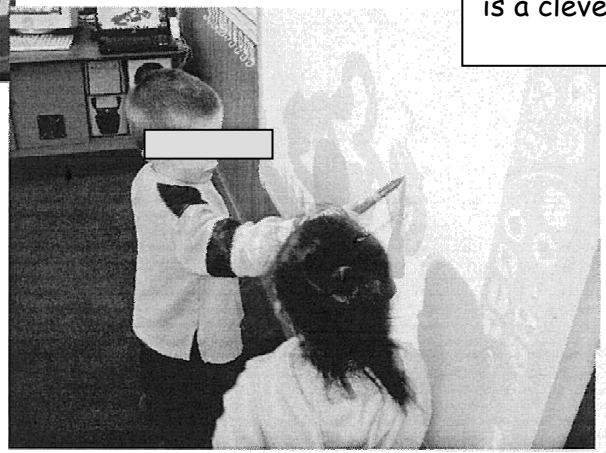
Tanya Takes The Lead



Noticing

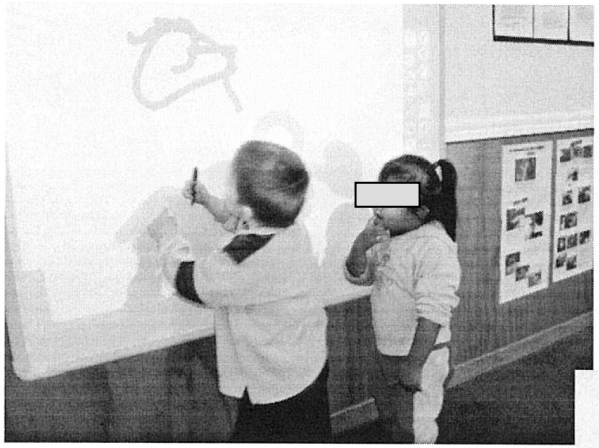
Well Tanya you are amazing, as you take Jake under your wing at the active board, a day after you explored it yourself. Tanya you tap the board when you want Jake to do something, which is a clever strategy.

As Jake runs the pen over the board Tanya, you closely watch his every move, fascinated with his picture.

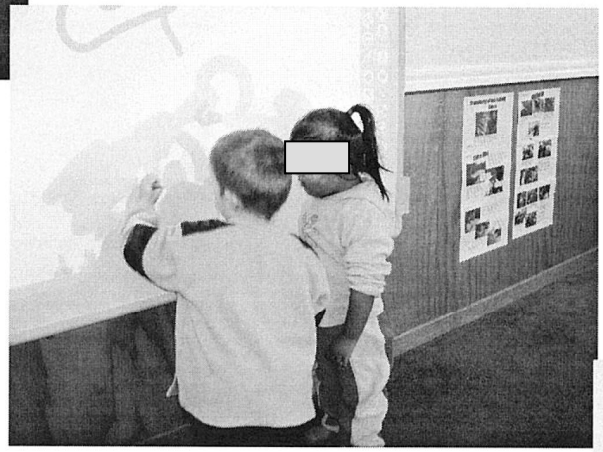


Or are you waiting for a turn Tanya? Because if you are, you are sooo patient. However Jake is not ready to hand over the pen yet.

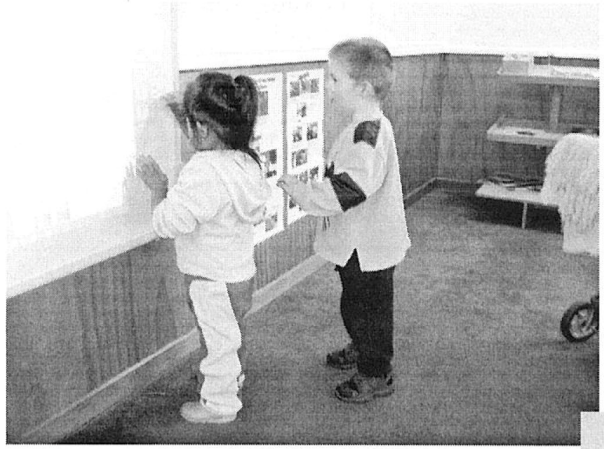
As Jake enjoys making green patterns across the active board, as green is Jake's favourite colour. Tanya possibly you are thinking what next! As you rest your fingers across your chin, however I am not completely sure.



But Tanya this is unimportant as your eyes revert back to Jake who is intent on filling the shape he has created.

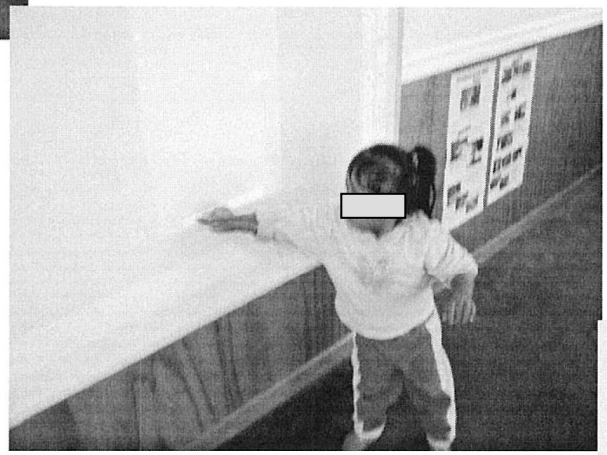


Or is Jake rubbing his work out, as I spot your hand pointing to the rubbericon down the bottom? Tanya you tap the icon a few times, clearly Jake is not following you, but you do not give up. During the next tap, you grunt. aah, which seems to work, as Jake takes the pen across to your finger.



It must be your turn Tanya, as Jake has given you the pen. Mmmm what will you do now Tanya, as I spot you tapping the pen over the icons down the side. I suppose I should wait & see.

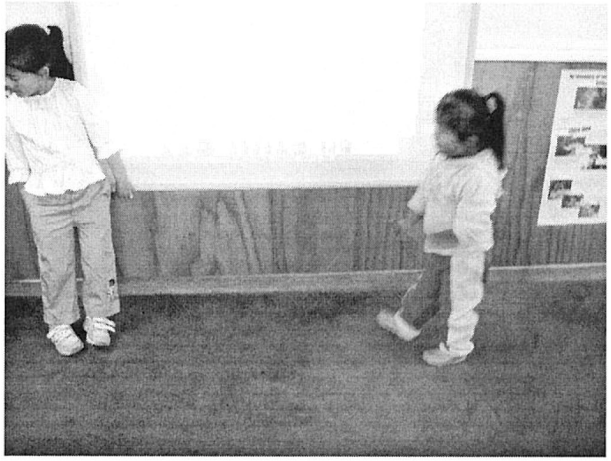
Okay, maybe that isn't the icon you want, as you attempt to close it down, by moving the pen across to the word cancel.



Right it has gone, and you find the pen icon, so now it is down to business. Tanya you draw lines across the board, but within minutes you find the shape icon, which intrigues you, as you drag them up and over your lines.

Tanya your picture captivates Lauren, so she stops to have a look, as this is the first time Laura has seen the active board in action. But Tanya you continue to focus on your picture, only occasionally turning to smile at Laura, Olive & Alexa.

Though Alexa is content to watch your moves on the laptop. Maybe Alexa is waiting for a turn? I wonder if you will let Alexa have a turn Tanya?



What Learning is Happening Here?

Recognising

Wow Tanya it is exciting how you can reveal your personality at kindy ... a bossy side, that we have never seen before, as it indicates you are feeling more comfortable. Tanya you try the strategy of tapping to obtain Jake's attention, and when this does not work, you modify your actions with verbal sounds .. , "Aah." which means you have a useful & successful strategy that works for you.

By sharing your skills with Jake on the active board Tanya, you are building upon your own knowledge of how each icon works and how you can incorporate them within your pictures.

As *"Language does not consist only of words, sentences, and stories: it includes the language of images and art"*

Te Whāriki, pg 72.

What are the opportunities & Possibilities Here?

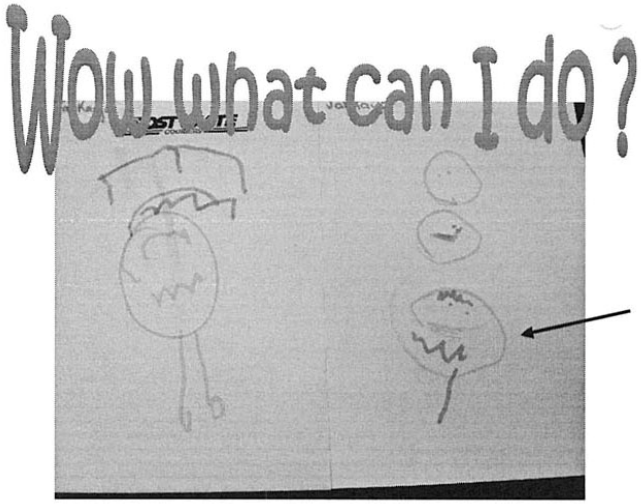
Responding

Tanya, I think you will become an asset to our kindy, as you master new icons and increase your knowledge of the active board, as you have proven capable of teaching your peers. T Tanya it is good to have experts amongst the children and now I can encourage your peers to find you when they need assistance on the active board, as you have strategies to make yourself be heard. Wow... I can see you will be teaching me a thing or two as well, as I am more hesitate than you are to just tap. Maybe I should follow your example. Just relax and enjoy, as *"The Complexity of Children's learning is increased where there are opportunities to participate in learning experiences that are authentic in the wider community"*

Kei Tua o te Pae, Bk 2, pg 3.

Teacher: Kathy

Noticing



Hey Jasmine today you eagerly take me by my hand and lead me over to the drawing table, where you promptly draw three circles, which later become a shark. Oh no be careful Jasmine those pointy teeth look very sharp and I am not sure if the shark has eaten or not. Jasmine your resourcefulness is endless as another shark, emerges from the depths of your imagination.

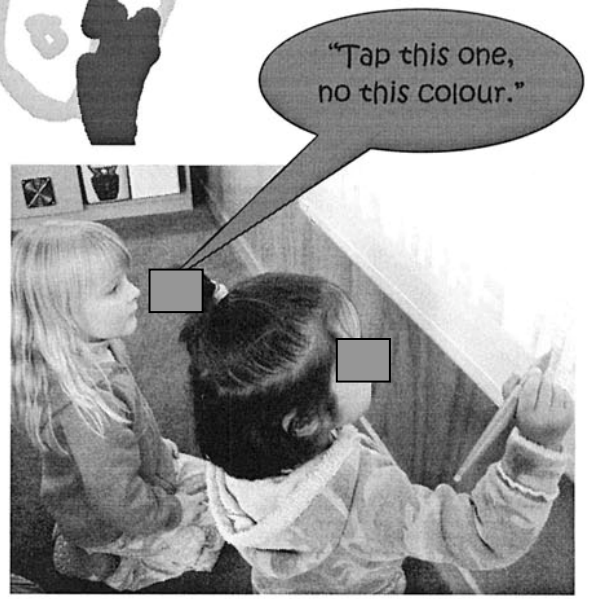
So it is great Jasmine you have heaps of ideas, as the activ board is on today, and I wouldn't be surprised if you get drawn to the board. Sure enough Jasmine you can't wait for a turn, and with a lot of patience you get to have a turn, which proves your ability to wait is impeccable, as it is a long time before your turn arrives.

Jasmine your passion for drawing is unbelievable, and the activ board is just another tool for you to use. So it is great we can have the active board on during the afternoons now, as the older children can help you become familiar with the different icons. One particular icon you enjoy Jasmine is the rubber, as it wipes out things you do not want. Wow!

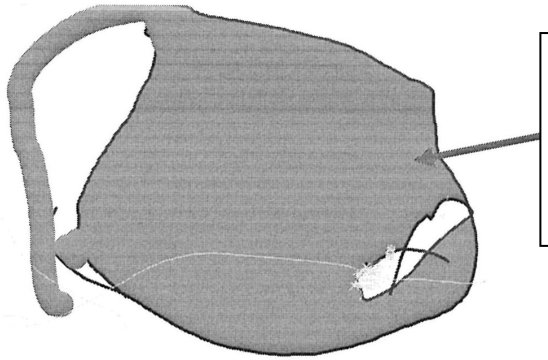
Okay that line has gone Jasmine, so what will you do next. Hey you decide to draw a red line over to your left. Mmm, I wonder if you will join the lines together.

It is really great how the children save their pictures to the laptops, so they can be included into the story, just like this.

Obviously not, because I spot the pen hitting the rubber icon again. See I said you like this icon, it is just marvellous.

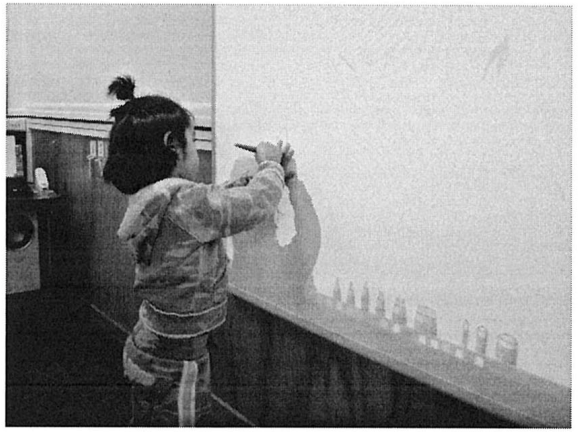


I really like the size of the active board, as the children have room to move. Which encourages large muscle movement, as children stretch up and across the board.



Okay it is obviously time to change the page and try something new, as I spot you tapping the arrow icon. Isn't it wonderful at the tap of the pen, the page just twirls over to a blank screen. This time Jasmine I arouse your curiosity to the paint brush icon, as this icon fills in,

Once again Jasmine, your imagination is boundless, as this is the first time I have seen anyone draw around there hands on the active board. I admire your resourcefulness Jasmine and I am sure this is what feeds your creativity, as you always tend to have pen and paper on hand.



"Maybe I should get you to sign one of your pictures Jasmine, before you become a well known artist."

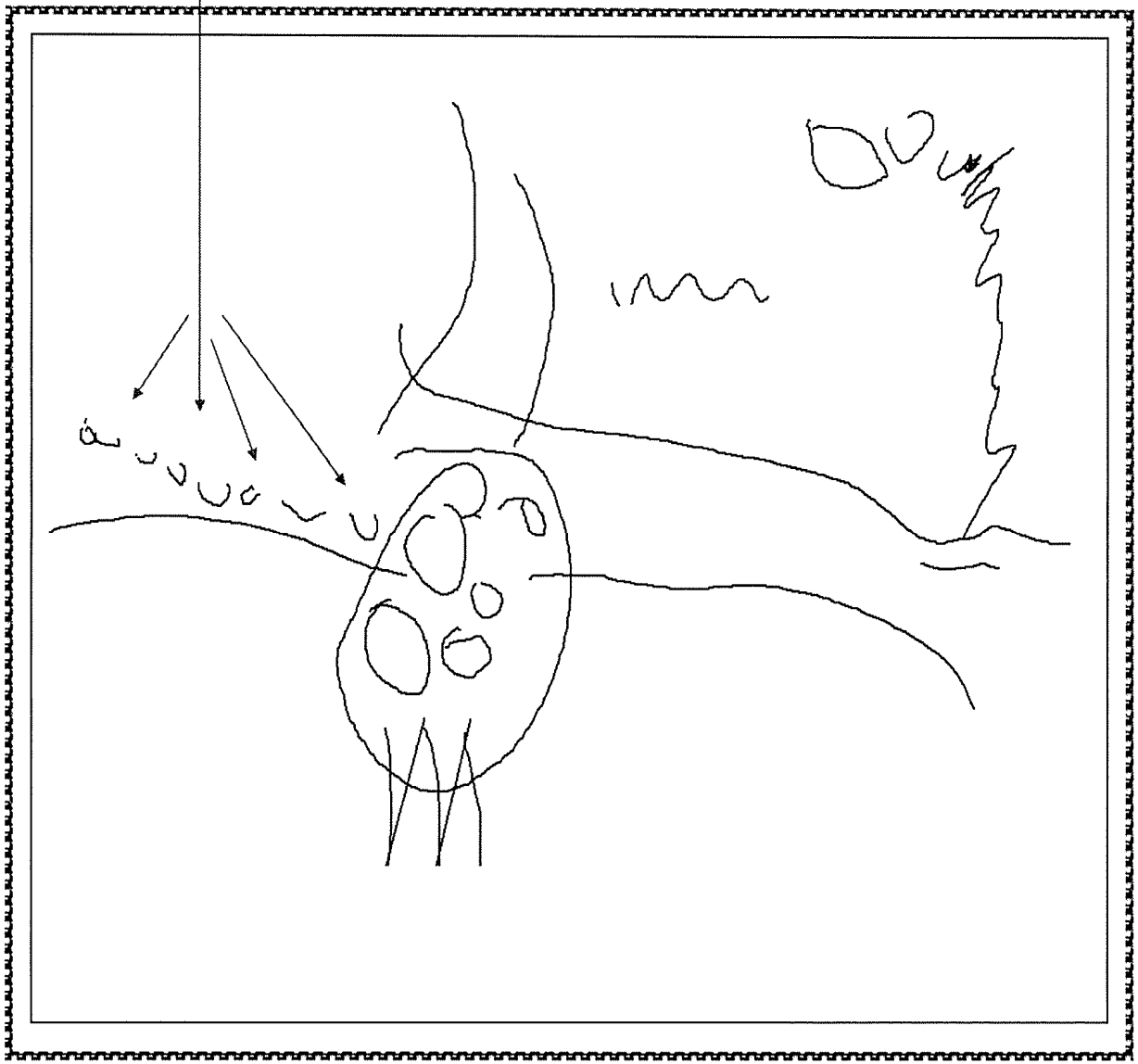
Hey Jasmine you have changed the colour again, and now it is time to reach up high, as your arm creeps up above your head, higher and higher, how far can you go?

Appendix Q

Teacher: Kuini

Henry draws on the ACTIVboard

The lines that are spinning.



Henry I really admired your ambitious attempts in showing me what you wanted to do today.

You relied on your hands, eyes and facial expressions to tell me that your wanted to have a turn on the Activ board. Sometimes you spoke so quietly that I was unable to hear the sounds you were making.

Pointing to the names "Hang your name up" I suggested so you could have your turn.

Our Activ board is a new piece of technolgy.

It is like a large computer screen, instead of being controlled by a mouse we use a special pen to make it do what we want it to do. It's much bigger than a computer screen, so others can see what is happening.

You choose the size of the line thickness from the tool bar and began to draw.

Making very swift movements.

I just couldn't believe my eyes, you see Hendrix it is the first time I caught you drawing.

You came and tapped me as I stood there with my mouth opened wide.

"What have you drawn here Henry?" I asked.

"You made a gesture with your hands as if flying.

"It's flying?" I asked. You smiled.

"What are these lines for" I asked again.

You started to spin around, "Oh I see it's spinning"

"Yes" you nodded.

I quickly showed you how to save your work Henry each time you added another line or a circle, "Quick Hendrix lets save your picture"

After several saves (with me leading you to the right icons) you were then able to independently save your own work, following the steps from memory. With this software there are 4 steps to remember in saving your work, so it's a challenging process to learn.

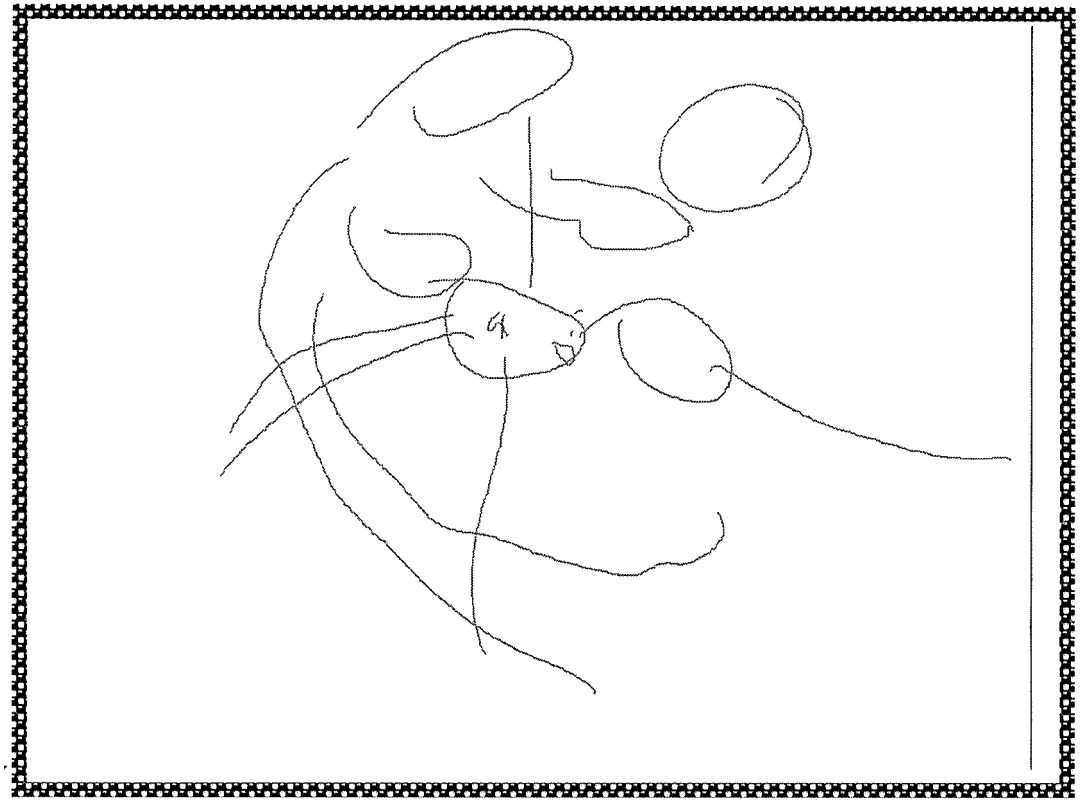
Our own motivation and determination was the key here Hendrix.

I was so excited for you Henry. The way you were using the Activ Board, the images you were creating, learning to save your work and seeing your surprised looks at what you were creating...

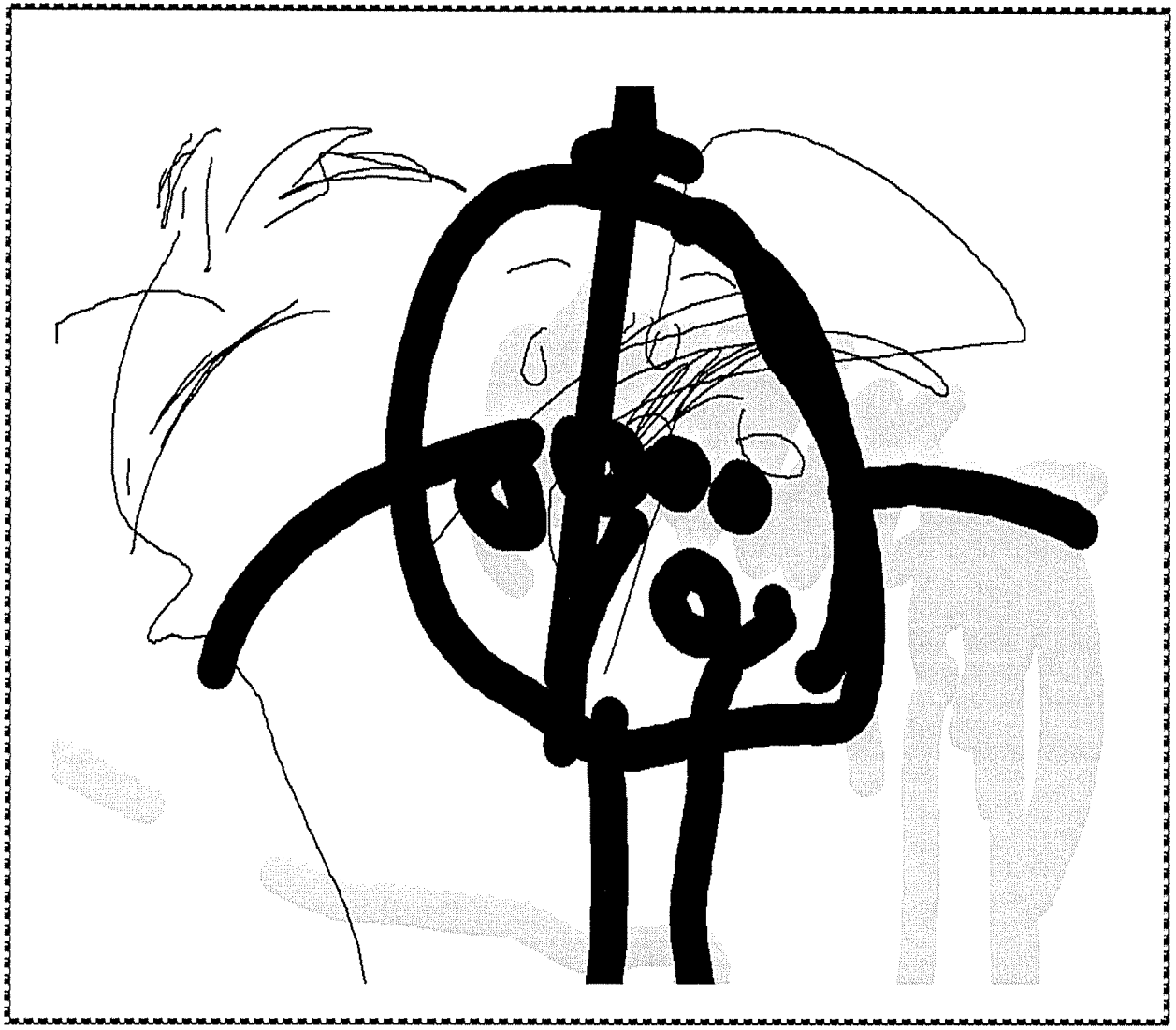
....I had to go and tell Kathy.

It was then that Kathy shared that you drew on the Activ board yesterday. Luckily Kathy saved your first drawing here.

This picture was drawn the day before



Henry wears a hat



Nola also noticed your drawing. She is the rep for the company who installed the Activ Board. She comes once a fortnight to teach all of us some new things.

Nola is also a Primary trained teacher. She noticed your excitment as you pointed out each part of the drawing.

Nola asked "Is that your cape Hendrix?" as your drew. Again you used hand gestures to describe what you had drawn.

"Where is your hat Henry? Can you draw your hat?"

Henry you responded by draing a solid black line down the centre of the self portrait.

Then Henry you selected the yellow colour on the tool bar and made vertical lines from top to bottom. Looking at me you started to beat your chest, "What is it Henry?" I asked. I knew that you were trying to tell me something...

"Is it a wrestler?... "I asked You Looked away... turning back to beat your chest again with both hands.

"Is it banana's?" I guessed. "Yeah" you smiled. "Nah nah" you replied and then you added more yellow lines.

What learning is happening here?

Recognising

- It is exciting to see Henry experimenting with the marks he makes, I wonder if he was surprised by what he had done, to stand back and really take in the human figures he had drawn.
- It is becming increasingly important for Hendrix to share his success. This shows that he values what he has done and it becoming so important to share and communicate with others.
- Henry relied on a lot of gestures today to describe and give meaning to what was happening. I havent seen him use these strategies for a little while. I hope those grommets are still there, sometimes they can move or become dislodged. It could be that the drawings created language that he hasn't used before? I don't know?
- Using the Activ board is fast, instant technology at it's best, perhaps reverting back to gestures rather than spoken language was his way of being able to respond at such a fat pace as he was drawing.
- The Activ board is a fascninating piece of technology. As a learning toll it has given Henry an opportunity to instantly see his image. The board is fixed to the wall and is the size of a small dinner table, so Hendrix stands directly in front of it, he has freedom to create life size figures (and he is beginning to master these) without the restrictions of paper.
- It has also provided Henry an opportunity to begin his journey with story telling (which will be a skill that he takes to school). Telling a story about what you have drawn requires the artist to describe the emotion or feeling they want to convey. Hendrix does this as he draws spinning with lots of short circular curves.
- Henry has also learnt to follow a sequence of work.

What are the possibilites & opportunities here

Responding

Model spoken language that Hendrix can use to describe drawings

Encourage and provide Hendrix with opportunities to use paint, pens, pencils, and other mediums to transfer his new found talents in drawing people into other areas of the curriculum, like: blocks, collage, and clay. All of these areas have mediums that can be manipulated into what the creator desires.

Make the Activ board available to Hendrix each day.
Encourage Henry to use the process so he can have a turn.

1. Hang his name up
2. Using the numbers & hooks next to the Activ board
3. While waiting for his turn he can choose something else to do.

The Activ Board is not designed to replace the value & experience of painting with real paint, paper and brushes.
Our vision of Glendale Kindergarten is to use the Activ Board as a tool for provocation. A tool to test ideas, thinking and to manipulate technology to make it do what you want it to do.

Hi Leah

Isn't this exciting!!!

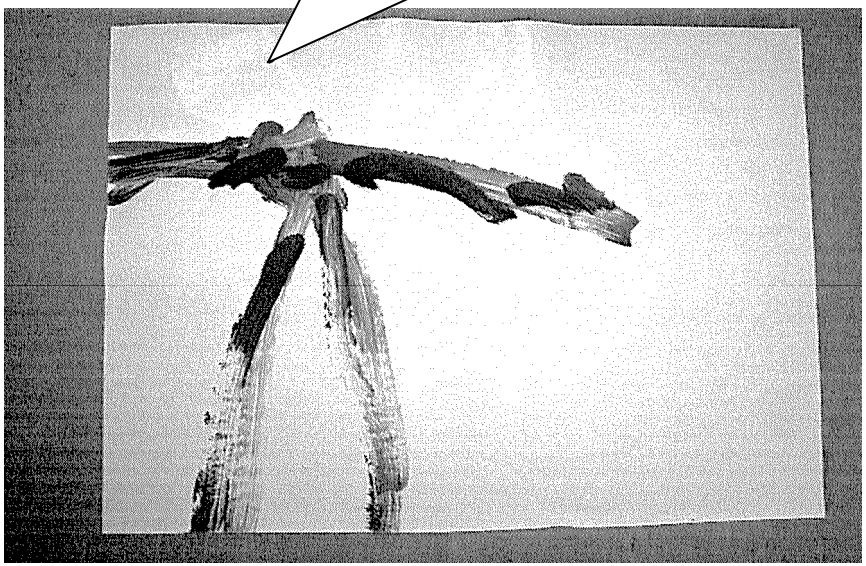
It was so exciting for me to finally catch Henry drawing. It was very visible to me that Hendrix also felt a surge of pride in his achivements. I am also wondering if the Activ Board gives Hendrix an instant response, he can see his marks straight away and perhaps because he faces the Activ board there are less distractions for him, so he fully engages in his work for a longer period of time.

As you know the Activ board is a new tool for us and we are just discovering what it can do as are the children, we are all learning together.

What other shapes or images have you noticed Hendrix drawing?

" Look Kathy, Spiderman"

Said Henry



22nd March 2007

Today I nearly tripped over Henry, I didn't notice him standing behind me and he didn't make it known that he was there.

I turned and he called me "Karen look!" "Spiderman" said Henry.

More excitement! Henry painted using a different technique. In his very deliberate image, Henry has incorporate a suttle layering effect. This adds to the life of Spiderman.

This is a ponderous thought here! Henry has had a large shift in his artistic images and the provocation for this images comes from a direct results of experimenting on the Activ board (Perhaps?).

Henry moves so quickly about the kindergarten, doing everything all at once.

When using paper and brush, there are so many steps involved. On the Activ board and the way it is set up, in a quite out of the way area with less interuptions (from other interesting things happening, other children & adults). The day before this painting Hendrix began to use 2 colours on the Activ board, the board has provided a means for trying something new like 2 colours. I know this may sound insignificant Leanne but the shift in thinking for Hendrix is...

- Specific colours can tell a story, they have impact and can give and convey meaning.
- While Henry doesn't use the label for a colour yet, he is able to discriminate colours from each other.