

SmartStart:

Creating new contexts for learning in the 21st century



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Research undertaken for IBM

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EXECUTIVE SUMMARY

This report presents the findings from the second phase of a project that was designed to explore the ways in which tablet technologies can be used to extend learning in early childhood settings. In the first report (Yelland & Gilbert, 2013) it was indicated that the project was designed to build on the successful IBM *KidSmart Early Learning Program* by exploring the potential of tablet technologies for knowledge building, meaning making and learning in the early years. Reconceptualising the impact of *KidSmart* for the 21st century requires not only going beyond updating the technology and *using* new tablet technologies in innovative ways, it also necessitates rethinking learning and the skills that are essential to live and be productive in this new era. This was the goal of phase two of the project. Here, it is advocated that educators should be aware of the wider range of uses of tablets that enable learners to become creators, innovators and support them in their reflections about whatever they encounter. This resonates with the demand for students to be fluent in 21st century skills (Partnerships for the 21st century, 2008). This project was designed to explore and extend discussion of these issues and build new relationships between preservice teachers and practising teachers. We were particularly interested in creating partnerships between schools and universities to promote 21st century learning. In this way this research aimed to:

1. Describe what constitutes **effective pedagogies** when using tablet technologies in early childhood settings.
2. Explore the potential of **applications** to support the teaching and learning of literacy and numeracy with young children.
3. Examine the ways in which tablet technologies can be **incorporated and integrated into early childhood curricula** to support new forms of meaning making, knowledge building and learning in the early childhood years.
4. Work with teachers to *explore professional learning opportunities* that will enable teachers to effectively incorporate tablet technologies into their programs.
5. Consider **resources** for teachers to illustrate practical ways of using tablet technologies with young children.

Our observations enabled us to make the following statements arising from the data:

1. Teachers can incorporate new technologies into their **pedagogical repertoire** when they are scaffolded and utilize appropriate conceptual frameworks for understanding teaching and learning with new technologies (e.g. the SAMR model, Puentendra (2011) Appendix 1).
2. The use of **specific applications** on tablet technologies (e.g. iPads) enable young children to have multimodal experiences that have the potential to extend **learning outcomes**. These applications can be *incorporated* in play based kindergarten learning programs to enhance learning alongside traditional materials and *extend* the children's learning potential via investigations and reflections. In the first year of school the tablets can both *support* and *extend* literacy and numeracy learning when they are *integrated* into the program.
3. The **use** of tablets is influenced by the teachers' philosophy, their preferences for learning and their stated goals for the children in their class. In primary school contexts, their usage was also impacted by state mandated curriculum and outcomes. The quality of children's learning is influenced by a range of factors. Tablets can also be used to *support* and *extend* learning in early childhood centres and schools, but their use is highly related to the teacher's confidence about using them and the ways in which they are perceived to add value to the learning experiences. The most innovative uses of tablets were when they were used for investigations by children who were able to create electronic artifacts that both communicated their discoveries, and enabled them to reflect on their learning in new and dynamic ways.

4. Teachers recognized the need for leadership and information about how to effectively use tablets in their learning programs. They also stated that access was still a pervading issue that inhibits their more frequent use. The teachers suggested that **professional learning opportunities** needed to show practical ways to use tablets in literacy, numeracy and in investigations which now form the basis of their programs.
5. **Planning** formats and requirements vary according to the age of the children and the requirements that the centre, or school, place on their teachers. Planning in the Kindergarten under investigation was spontaneous and written in retrospect, in the form of observations that then formed the basis for future interactions with the children. Thus, the design of resources took the form of ideas for learning activities that might stimulate playful learning, inquiries and reflection. In the primary school context - teachers planned collaboratively and were able to embed the use of school iPads into their literacy and numeracy 'rotations'. This could be extended as they became more familiar with the range of possibilities for using the tablets. There was little evidence of iPads being used to support investigations, so the preservice teachers worked effectively with the class teachers to create multimodal resources to reflect the findings from our investigations.

RECOMMENDATIONS

1. **Professional learning opportunities** need to be made available for teachers if the integration of contemporary technologies (e.g. tablets) is to be effective. These professional learning opportunities may be based in two different scenarios: a) teachers working with preservice teachers on their practicum and b) in carefully designed programs with specialist staff (Refer Appendix 9). Both of these approaches align with the new strategic plan of the Victorian Department of Education and Early Childhood Development (DEECD) who recognize that a major focus on *changing learning culture and supporting innovation* is needed as one of the strategic pillars for the successful use of digital technologies.
2. **A bank of resources** that support *bright ideas* for the use of tablets in early childhood might be created. The results from this study provide valuable information about the design of exemplary activities that have the potential to improve learning outcomes and encourage teachers to use transformative pedagogies. This can be supported with a conceptual framework (e.g. SAMR) that encourages a variety of usages for the tablets that suit the diverse conditions for learning that teachers encounter on a daily basis.
3. Ongoing **research** into the innovative use of tablets in the early years is needed in order to provide evidence-based data about the impact of these new technologies on teaching and learning in the range of early childhood settings that exist.
4. **Strengthening partnerships** between all those interested in promoting the learning of young children should be maintained and extended to highlight the transformative impact that the use of new technologies can have in educational contexts.



BACKGROUND

The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn and unlearn.

(Alvin Toffler, Future Shock ,1970)

As we enter the second decade of the 21st century there has been an increasing focus on education and the role that it might play in the transformation of individuals, who need to function effectively in a global economy. The successful transformation of the Ontario school system (Fullan, 2012) has provided some useful insights for those interested in improved learning outcomes and has suggested ways in which a system can support a shift from a 'routine oriented economy to a creative oriented economy' (Martin & Florida, 2009). This shift aligns with work that has been done regarding 21st century learning skills (Partnerships for the 21st century, 2008; Trilling & Fadel, 2009) which advises that citizens of the future need to be fluent in the four c's; *creativity, critical thinking, collaborating and communicating* and thus schooling needs to promote these skills. Fullan (2012) extended this to include two more qualities, citizenship and character education, which he regarded as being important for contemporary lives. He further suggested that in order to move forward with improvements to the education system we need *focused innovation* in two areas; *early childhood* and the integration of *new technologies in education*. Fullan (2012) contended that for both innovations *new pedagogies* are required that enable educators to transform teaching and learning and make it relevant to life in the 21st century. Such disruptive innovations (Christensen, 1997) are the key to the future growth and sustainability of schooling systems that are struggling to remain relevant to the lives of students. Focusing on early childhood education is particularly relevant since numerous authors have noted the importance of investment in the early years (Martin & Florida, 2009; Schweinhart, 2002). It is our contention that we need to grow a new generation of learners who are fluent in 21st learning skills that incorporate the fluent use of new technologies as relevant.

This project is concerned with both of these stated 'focused innovations'. Specifically we were concerned to explore and examine the ways in which new mobile technologies (tablets) can contribute to new ways of learning for young children in the year before formal school and in the first year of school in one Australian state.

While electronic technologies have been available in school since the first personal computer burst onto the scene in the late 1970s, their impact on education has been minimal (Yelland, 2005, 2007). They still tend to be regarded as an *add-on* or a supplement to heritage curriculum. They have not transformed curriculum and pedagogies in schools. So while the ubiquitous use of technologies has revolutionized all other areas of our lives, changes in education have been restricted to *pockets of innovation*. In a review conducted in the US, students' views (Project Tomorrow, 2013) about school use of technology over a period of 10 years (2003 - 2013) were sought. The results highlight the gap between home and school uses of technology that often results in



disengagement with schooling in the middle years. Students cited reasons why they lacked enthusiasm for technology in schools as being related to the lack of availability of up to date technologies, restrictions placed on access and the use of personal, and mobile devices, as well as also being able to seek out sources on particular sites which were regarded as being unsuitable and thus banned from use. The use of social media was discouraged and there were limited or no opportunities for 'flipped learning' scenarios (Hamdan, McKnight, McKinght, & Arfstrom, 2013) which they thought would benefit their learning and collaborations in blended learning contexts.

It is in this context that discussions about learning and the use of new technologies have been created and this has been particularly evident for the youngest of children in early childhood settings (Plowman & McPake, 2013; Yelland, 2007, 2011). While there have been those who have maintained that young children (under two years of age) should have no screen time at all, (e.g. Haughland, 1999; Healy, 1999). there is now widespread recognition that technology is here to stay and can play a role in the lives and learning of young children (NAEYC & Fred Rogers Center, 2012). However, there remain strict conditions (developmentally appropriate) under which this can occur (Copple & Bredekamp, 2009). These were created before the advent of the new tablet technologies, which have become such an integral part of our lives and those of our children.

We take a very different view and believe that living in 21st century means that we can take advantage of the benefits of new technologies while being aware of the consequences of their extended use with young children. One of the main differences about learning today is that technologies have enabled us to become multimodal learners (Yelland, 2007). In this way young children today can gain greater insights into ideas, can communicate their understandings in new ways and can experience concepts in various modalities that enable their learning to be richer and deeper than in previous times. In using new technologies children will need to be skilled in critical thinking, creatively exploring ideas, sharing ideas and collaborating with peers and can build and communicate their findings to a broad audience. Our research illustrates some of the ways that this can be achieved in 21st century early childhood settings.



RESEARCH DESIGN

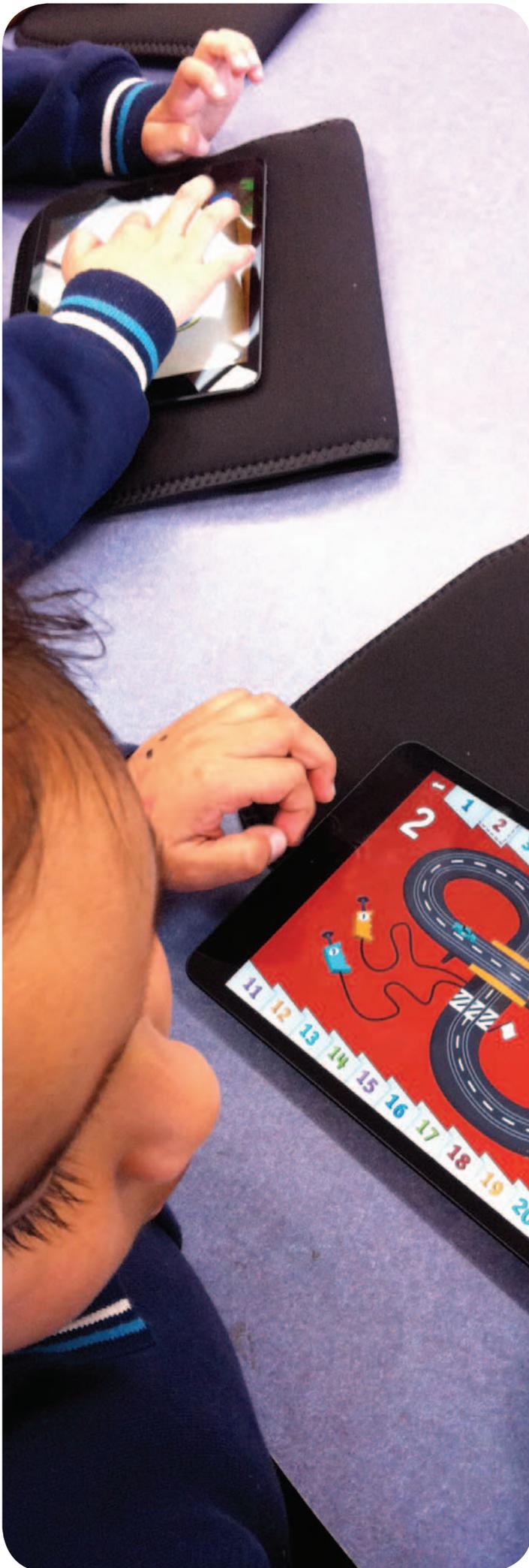
This study was designed to explore and document the innovative ways in which tablet technologies could be integrated into early learning scenarios (Kindergarten and the first year of school). We wanted to extend the potential for *new learning* (Australian Council of Deans of Education, 2001) with *new technologies*, and to support teachers to use tablets to transform their pedagogies and practices in early childhood education. To achieve this, teachers were partnered with preservice teachers who were fluent in the use of tablets. A major feature of this involved thinking about the role of new technologies in education in contemporary times.

THE CONCEPTUAL FRAMEWORK

The SAMR framework (Puentendra, 2011) shown in Appendix 1, contends that the use of new technologies in education can be described as having the following characteristics:

- **Substitution** - in which the technology acts as a *substitute* for traditional teaching materials and thus there is no fundamental change to the learning context, apart from the fact it is digital.
- **Augmentation** - the technology being used *changes* the learning context with some functional improvements being made.
- **Modification** - where the technology allows for some *significant task redesign*.
- **Redefinition** - in which the use of technologies allows for the design of *new* learning experiences that were previously not possible.

Puentendra (2011) described the first two contexts as enhancement of learning, and the second two as having the potential to *transform* learning. At first it might appear that all learning experiences should be designed to be at the level of *modification* and *redefinition*, but it is apparent that depending on the type of learning experiences that a teacher is planning, each one has *relevance* as a pedagogical approach. For example, when introducing a concept, a teacher may decide to show a video to her class on a tablet (Augmentation). Yet, she might also diverge in a completely different direction and create a 'flipped learning' scenario where the children use technology at home and then come to their centre or school ready to contribute in a different way (Modification or Redefinition). On balance we would hope that the new technologies would result in the *transformation of learning* contexts but there will also be times when they *enhance* traditional pedagogical approaches.



THE CONTEXTS

In this second phase of the research, four early childhood preservice teachers worked with early years teachers in both Kindergarten (four year old play based settings) and schools (with five and six year olds in the first year of compulsory schooling). Each preservice teacher discussed ideas for activities with the teachers and then designed and implemented learning activities that incorporated the use of tablets.

The research was located into two different settings; a Kindergarten and a public school. Both settings had participated in phase one of the project.

Four Year olds (Kindergarten Group): The Kindergarten was located in a suburban region approximately 15 km from the centre of a large metropolitan city. It had a large outdoor area that facilitated the fluid movement of the children from indoor to outdoor activity. Both teachers were experienced as early childhood educators who had taught for over a decade and each was supported with a teacher aide. There were 49 children attending in the two groups. Each group had one tablet which was left there and the preservice teacher brought another one each time she came to the centre.

Five to Six Year olds (Preparatory Class): Three teachers worked with 79 children in an open plan area. A full time teachers aid was allocated to them, as well as other ancillary workers who supported the teachers for specific activities, for example in literacy and numeracy 'rotations'. While the teachers had a 'home group' of children for administrative purposes, they then separated into needs based groups to teach literacy and numeracy. The school was located in a low socio-economic income area, and for most of the group, English was not their first language. There were in fact 42 languages spoken by the families in this school and they had arrived in Australia from 32 different countries. The school had a 'bank' of 20 iPads, which could be taken to any classroom and then purchased an additional 20 iPad minis just before the research project began.

The preservice teachers were enrolled in their third year of a Bachelor of Education (Early Childhood/ Primary) course which will qualify them to teach children in the age range from birth to 12 years of age in both non compulsory (birth to four years of age) and the compulsory years (five to 12 years) of education. The students were given tablets (iPads) and a range of suitable Apps were downloaded after discussion about what might be used for the duration of the project (Appendix 2).

After initial discussions with the teachers, we planned various activities to carry out with the groups and then returned to share these to determine if they were a good fit for the teachers' program. The data collection took place over a period of six weeks in Term 2 of the school year beginning in the second week.



FINDINGS

Four Year Olds (Kindergarten)

The Kindergarten had a play-based program in which the children were able to select an activity from a range of materials that were available, both inside and out in the playground. Inside, this included painting materials, a carpet and book area, a puppet theatre and a large range of craft materials and plastic items. Outside there was a sand pit, water play, space to run and various forms of climbing frames. There were two groups of children with a total of 49 (25 & 24) with an average age of four years and nine months both taught by experienced (> 7 years teaching) early childhood educators. The tablets were available on a table inside, since the children were used to selecting an activity and completing it on a table. Additionally, each preservice teacher also occasionally asked the children if they wanted to participate in a tablet based activity.

Based on the results of phase one – the teachers were keen to move away from using skills based Apps, to more creative

uses of the tablets in open ended explorations and for communication of ideas and reflections. Thus, while a range of Apps were still available for the children to use (Appendix 2) during this phase of the project, we were more enthusiastic about trying a guided learning approach (Plowman, Stephen, & McPake, 2010) in which there was a structured, yet flexible, support for children's learning with the new technology.

In particular we focused on:

1. Using the (digital) camera for explorations and reflection.
2. Searching for information for investigations and to support play based scenarios.
3. Creating eBooks.

For each of the focal points we have created a learning story and will use the data from our observations as well as from comments and notes made by the two teachers in each setting. The learning stories are included in full in Appendices 2 - 5.

1. Using the (digital) camera for explorations and reflection

Learning story 1 (Appendix 3) revolves around the use of an App called *Mad Pad* which enables a montage of pictures and sounds to be created and replayed. This learning story is an amalgam of two learning experiences on the same day in the Kindergarten setting with six children (four years of age). One of the things that we found to be useful when introducing a new idea to young children was to show them an example, so that they were able to either use it as a model to produce their own version, or innovate on it because they can see some relevance of it to their experiences and interests. In this instance, *Mad Pad* enables users to view and play with other users *Mad Pad* creations on the Internet and share on YouTube. In one, a series of 12 photos and sounds of a car are arranged in a 4x3 matrix and in others there are various scenes and sounds from daily lives as well as others using a range of musical instruments. The idea is that the clips are 'short and snappy' and can be played individually, but it is the range of sequencing and innovating on the sounds that makes it more fun and lifts its creative potential so that each time it is a different experience.

The two *MadPad* sets that were created engaged the children in thinking about the sounds in their environment (Appendix 4). They realized that they could make their own sounds (clicking fingers, clapping, moving their tongue to make clicking noises) and that they could also use the various objects in the centre (e.g. sieves, cups, saucepans, pieces of equipment) to create sounds. With this App, the video can be taken by the teacher or the children. Some minimal planning is needed, since the area has to be relatively quiet for an effective recording to be achieved, and the children need to know how to make the sound, and how long they need to maintain it for the recording.

The children were immediately fascinated by the actions and what they had to do. Jenna's observations about the students in the process of creating their *MadPad* montage reveals their enthusiasm:

Allan said, 'What about this sound'? And began clicking his tongue. Brandon followed with, 'What about this'? And clapped his hands. We were walking around the playground searching for sounds we could hear. Allan said, 'I know!' And ran to the swings. He stood on the swing and said, 'look at his sound!' (a loud squeaking sound came from the swing). Brandon ran to a large circular decoration that was in the garden. He began tapping on the decoration with his hands. He said, 'we can use this sound!' We then went to the sandpit to find new sounds. Allan picked up two pots and began said, 'Look at this one!' And began banging the two pots together. Brandon continued to explore sounds by tapping on different objects that he could find (tapping a helmet, a bucket, a wooden plank and a metal box).

In Learning story 1 (Appendix 3) Jenna (preservice teacher) illustrated the ways in which sounds and pictures can be used to create contexts for exploring the nature of sounds and how we can make so many different sounds with things in our environment. The experiences could be extended in a variety of ways to include children providing statements about themselves and what they enjoy, by telling stories, and for musical experiences with instruments and songs. Being able to combine the modalities of oral, aural and images, represented a good opportunity to make and reflect on the sounds in our environment, and the sounds that we listen to in a variety of formats. They can form the basis for different learning activities – some of which we extended in the Preparatory class findings later in the report.

In the second example of using the camera, we took photos of the children so that they could use them in an App called *Jigsaw puzzle maker*. The children had shown an interest in puzzles and Nicky (teacher) had said that it would be great if we could extend this to their iPad use.



Figure 1: Jigsaw Maker

Jess (preservice teacher) observed that when playing with the *jigsaw maker*, Abby (Kindergarten student) was able to take a photo of herself, and then together they inserted it into the App. Jess noted that it was 'a great app for the children' and that it would be useful to always have different images of the children available to use when they wanted to make a jigsaw. It was valuable as it personalized the puzzles and extended playing with three dimensional jigsaws. Further, it meant that they had a much wider range of puzzles available to them and that they could continually have to think about new ones rather than build a puzzle they may know from memory after playing it each day at the centre. Jess wrote that Abby was very competent in putting the jigsaw together; starting with corners and edges and working into the middle, while explaining that she was looking (at one point) for a puzzle piece with pink on it as it would join the other puzzle piece with pink on it, creating her sweater in the photo.

A third example of using the camera is revealed in a reflection of the interactions between two children and a mother with a new baby who were seated on the sofa in the centre.

Chelsea and Gemma (Kindergarten students) were sitting with Gemma's mum (Jacqui) and 9-week-old Flynn on the sofa this morning. Jacqui was staying on at the Kindergarten after bringing Gemma to preschool so she could spend some time with her and the new baby, and they were chatting about things as Chelsea joined them on the sofa. Chelsea had been playing with a game on the iPad and moved in to sit next to Jacqui, while Gemma was on the other side. She used the iPad to take a photo of the mother and baby and showed it to them. 'That's a great photo of us all... Thanks Chelsea!' said Jacqui. Gemma then decided to get some paper and crayons and started to draw a picture of Flynn. Not in his mother's arms but as if it was a portrait. She gives the drawing to her mum when finished. 'That's lovely Gemma! You really made it look like Flynn with the same colour of his eyes and his onesie!' Chelsea added, 'It's a good drawing! He looks like my photo!'

(*Observation notes, June 18*)

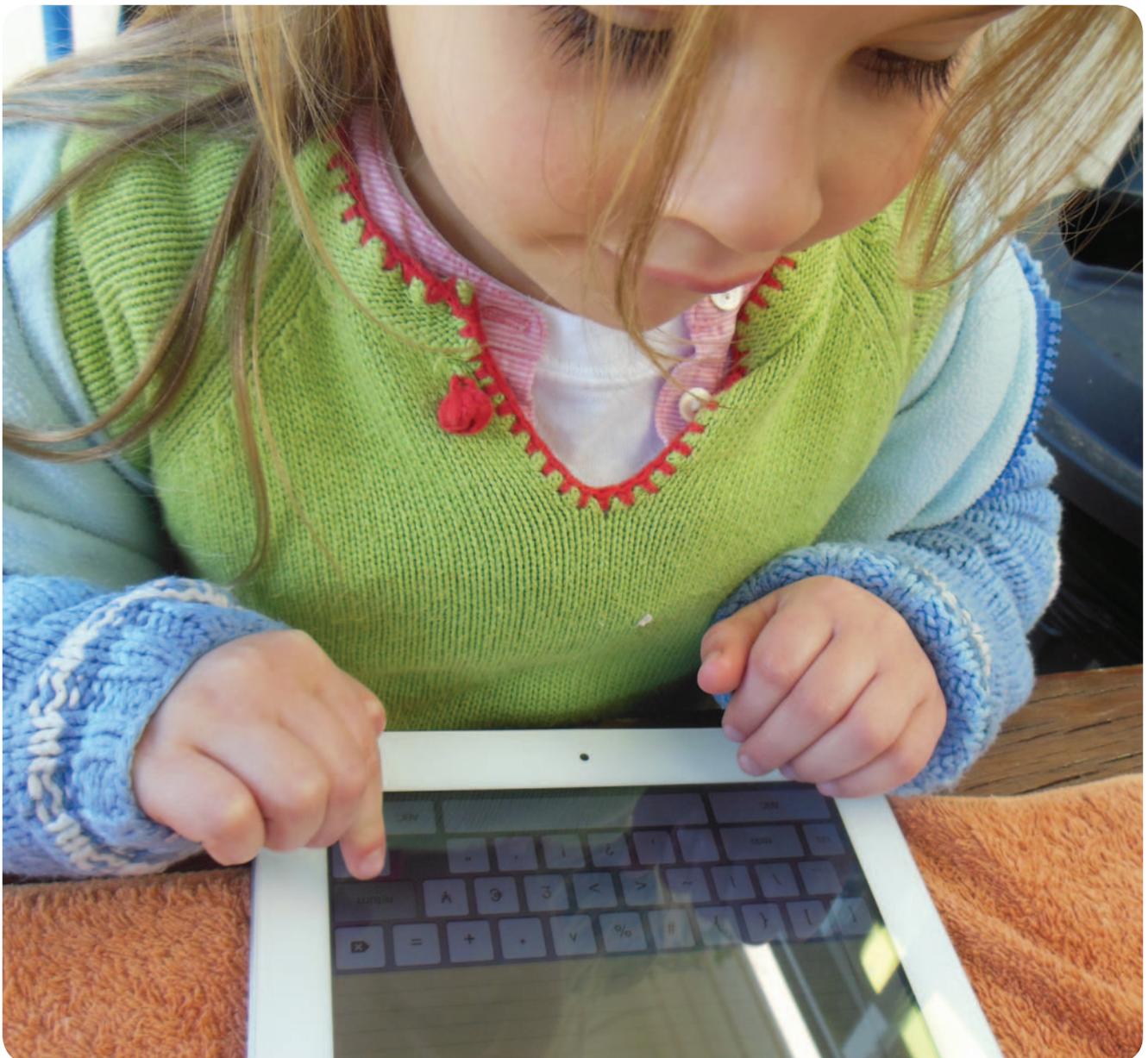
This reflection shows the potential to extend these representations of the baby in different modalities and it formed the basis of later conversations when making eBooks, about whether to incorporate photos or drawings into the storyline, or indeed, whether to combine them in the illustrations. The learning context with iPads gave the learners this choice. They could combine the different formats or leave them separate. They could control what they wanted to put into their books. This would not have been possible without the tablets and it was evident that they enjoyed making the books by the amount of time they spent reading them afterwards.

Two of the other Kindergarten students, Chelsea and Tilly, also collaborated in creating a guessing game with the photos that they had taken on the iPad. They took close up and 'partial' photos of objects and clothing that they could find in the centre. They then went around asking their friends if they could guess what the object in the photo was. This was an extension of a game that Nicky had set up in the Kindergarten with laminated (partial) photos of items in the playground,

such as the gate or the climbing frame, which were located in various spots around the playground. We asked the children to talk about the ways in which the partial view compared to the view of the whole object in conversation time. The camera on the iPad enabled a number of activities that would not have been possible if it was not available, to use spontaneously. In a different scenario, Nicky got out some large sheets of paper to measure how tall some of the children were:

Today we measured how long/tall everyone one was in the group. The children lay down on a large sheet of paper and I made a pen mark and recorded each child's name beside the mark. We then took photos of those children who wanted to find out who was the tallest and made them into an eBook with sentences about each person. Tilly is taller than Chloe. Max is the tallest boy in our class. Agnes is the tallest girl. Chelsea is taller than Sylvie and Brandon is shorter than Felix. Maryam and Lena are the same length.

(Nicky reflection, June)



2. Searching for information for investigations and play based scenarios

The Kindergarten children also used the tablet in their exploration of the topic hermit crabs, since they had two in the Kindergarten. An overview of the potential of exploring this topic is provided in Figure 2 in the form of a curriculum web.

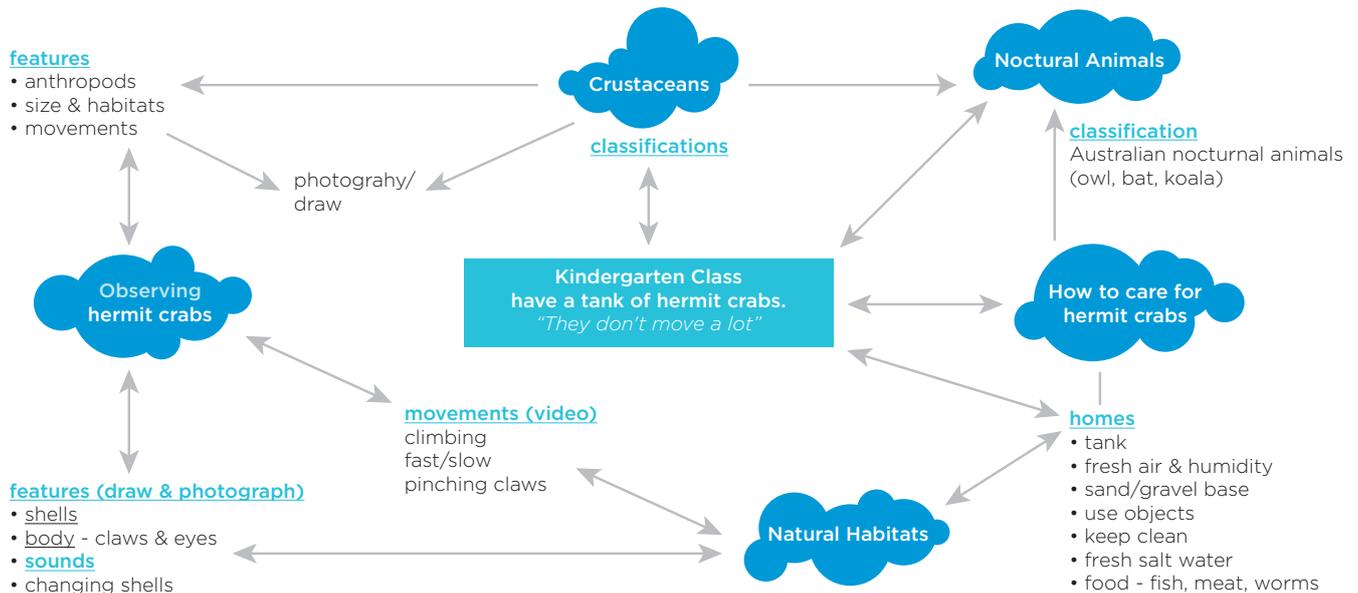


Figure 2: Curriculum web for hermit crabs

The children were fascinated by the crabs, and in particular their lack of movement while they watched them. This led Nicky (teacher) to help them to search for more information about the crabs using the tablet, and the discovery that they were nocturnal animals. Photos could be taken and saved for discussions and some of the children brought items to add to the crab environment, such as additional shells, to make their lives more pleasant. Charlotte brought in a new shell for the crab when they discovered that they liked to move

into larger ones as they grew (Figure 3). Here, the tablet was used to extend their experience by enabling the children to search out more information easily and also to keep a record of their observations. They drew pictures of the crabs, and moved like crabs in some of their play sessions. Again, the tablet provided a context for multimodal learning as they found videos of the crabs on *YouTube* and this enabled them to actually see the crabs move which was not possible in their viewing of the crabs in the daytime.

EYLF Learning Outcome 3 - Children have a strong sense of wellbeing. This is evident when they take increasing responsibility for their own health and physical wellbeing.



In a previous session Charlotte asked if we should have a shell in the hermit crab house for Spike or Sprinkles to relocate into once their shell gets too small. She shared that she could bring in some shells - and she did. They were perfect and Charlotte chose one she thought they might like and placed it inside their house. We will now wait and watch to see if either of them make it their new home.



Figure 3: Charlotte brings a new shell for the hermit crab

At the same time the children were talking about planting seeds and growth to plants. Nicky was able to search and show them some time lapse photography of different types of growth and discuss how this happened with them.

Some examples that are particularly good are:

- Radish - from seed to plant
<http://www.youtube.com/watch?v=d26AhcKeEbE>
- Sunflower time lapse
<http://www.youtube.com/watch?v=ykXXEr4SBRc>
- Wheatgrass
<http://www.youtube.com/watch?v=9nvAzt9sWlg>

Lenyssa (teacher) reflected on the use of the tablet for research when the children became interested in some fossils that Charlie brought back from his family holiday:

Charlie brought in a fossil that he had found at Lake Tyres to share with us. We were unsure of how the amazing shapes and patterns had formed in the sandstone, so we decided to try and use the iPad to research more about them. Charlie and Meesha helped to search for pictures of sandstone that looked like Charlie's pieces. We found out that the rock that had the shell imprints in it was actually

called an erosion fossil. This gave us the idea to make our own fossil imprints.

The children used all sorts of shells to make imprints in clay. We think they look fabulous! Next week we will varnish them and maybe even add some paint for colour.

(Lenyssa, June)

[EYLF Outcome 4](#) - Children use information and communication technologies (ICT) to investigate and problem solve. [EYLF Outcome 2](#) - Children demonstrate an increasing knowledge of, and respect for natural and constructed environments.



Figure 4: Investigating fossils

3. Creating eBooks

In discussion with the teachers we decided that it would be beneficial for the children to create an eBook. The content would be about themselves and the things they liked and could do. This was especially relevant at the time because the group had been discussing being helpful and good to each other. One of the things that both teachers were trying to extend in the children was their self-esteem and confidence, so thinking about what they were good at was a positive way to do this. As it was the first time for doing this we planned to keep it simple and decided that a maximum of 10 children per book was optimal so that each book was a manageable size. Each child would have a photo, and would introduce themselves (My name is...) followed by two statements; "I like to..." and "I am good at...". This was quite challenging to capture on the App as the centre was a naturally jubilant and noisy area and recordings were thus difficult to capture without too much background noise. Additionally, the books took quite a while to create, as a few of the students were reluctant to speak into the microphone of the tablet and often spoke so quietly it was difficult to hear the recording. But the effort was worth it (Figure 5).

The enthusiasm for the activity as well as some of the ideas that were incorporated into the various eBooks were noted in Jess' reflective observations.

- Spoke to children individually about creating an iBook using MyStory
- Discussed with C and B (students) what they were talking about in the Kindergarten. C informed me that they were thinking about saying nice things about each other
- I discussed with N (researcher) if she would like me to incorporate this into a leaning story (a photo of a child per page with a voice recording saying 'my name is ... and I am good at ...')
- N really liked this idea so I spend the remainder of the session discussing with children things they thought they were good at, or things they liked about themselves
- Children stated that they were good at painting, drawing, climbing, building, smiling, hugging, playing and sharing (all were things that they did during their time at Kindergarten which was good because we could share the eBook with parents so that they could see how their child was liking/ spending their day).

continued ---

Next week planning:

- Discuss with children what they like about themselves
- Remind them we are looking at positive aspects about each other
- Explain that the eBooks will be shared with friends and parents
- Give brief instruction on how to use MyStory (if needed).

(Jess Reflection Notes)

Today we began the MyStory eBook, I named it 'My name is...!' since that was how each child began their recording. Examples below:

- 'My name is B ... and I am good at loving my mum and my baby sister' – B was at first a little hesitant to record her voice, but enjoyed decorating her photo.
- 'My name is C ... and I am very good at riding bikes' – C was very enthusiastic and excited to use the iPad as he had in previous weeks. Once he finished his picture he wanted to continue using the iPad to play another game.
- 'My name is O ... and I am good at building Lego' – O was building a Lego castle at the time
- 'My name is J ... and I am good at painting' – J showed me some of her painting in the classroom and enjoyed decorating her photo using the pain on the app.
- 'My name is T ... and I am good at painting too' – It was difficult to decipher if she genuinely thought she was good at painting or was just saying what her friend before her had said.
- 'My name is A ... and I like to colour in' – A asked if she could decorate the photo a lot more than the other drawings that I had shown her as an example of what to do. I said of course she could, but asked her to make sure that everyone could still see her face, so that people knew it was her when reading the eBook'

(Jess Reflection Notes)



Figure 5: eBooks. My name is... I like... I am good at...

It was possible to type the words to accompany each recorded statement underneath the photograph. This turned out to be beneficial because it not only linked text to spoken words, but also since some of the recordings were difficult to hear. When the book was completed the children returned to it frequently to read and listen to it. Learning stories 2 and 3

show how this activity translates into learning, and considers the Australian Early Years Framework guidelines to describe how learning might contribute to the child's dispositions in the areas outlined.

I explained what we were going to do to make an eBook... I asked M (student) what she likes to do. M told me and then practiced saying her words before we recorded them. 'Hi, my name is M, I like watching TV and I am good at jumping'. As we were constructing the book M asked if she could draw on her photo and I thought this was a great way to personalize each page and it also meant that the children got to create something on the page that was unique. I told the children not to draw over their faces otherwise their friends would not be able to see them! M said, 'I am not drawing anything, I'm colouring the fence!' Olivia drew a tiara on her head. I asked why she was drawing it and she said, 'Because I like to be a princess!'

(Jess Reflection Notes - June)

Jess also made an eBook with the children that captured what they had been doing during the session that day, so that they were able to *reflect* on it and share it with their parents when they came to collect them. In Learning story 4 we discover that the children were able to articulate what they were doing while they played. Further, making the recording facilitated their reflections after the event, so that they were able to be meta-cognitive and recall the type of learning that they were engaged in during the experience. The learning story indicates that the children were able to develop a strong sense of well being about what they were doing, and achieving in their play. They could effectively communicate and express their feelings and actions with others while they were engaged in various play based scenarios. Having this recorded in an eBook enabled teachers to return to events that had already occurred to ask the children if they could recall the activity and the time it happened. This stimulated their memory and they were able to reflect how they had built on these activities. It was also a very useful way to share what children had been engaged in with their parents.

Summary

The partnership between the preservice teachers and the Kindergarten teachers enabled learning experiences to be created that built on the educational program of the centre. The activities were based on the following:

1. Using the digital camera for *explorations and reflection*.
2. *Searching* for information for *investigations* and to support *play based scenarios*.
3. *Creating eBooks*.

In each example provided here the tablet both *supported* and *extended* the learning opportunities available to the children. They were able to encounter multimodal learning that incorporated linguistic, visual, oral, aural and spatial dimensions and additionally it afforded them the opportunities to make new discoveries by seeking out information as it was required and stimulated by their explorations and discoveries.

For the teachers, the availability of the tablet enabled them to support the learning of the young children, not only to *substitute* and *augment* existing ways of learning but also facilitated *modifying* and *redefining* learning that engaged them in rethinking their pedagogical approaches and extended their repertoire of pedagogies available to them.



FINDINGS

5-6 Year Olds (Preparatory Class)

In Victoria, in the first year of compulsory school, five year old children enter the Preparatory class. In this research context, three teachers worked as a team, but also had primary administrative responsibility for their own group of children (average age five years eight months). In this way, a large part of teaching was done with the collective three classes of children (79 children), especially when introducing a new concept or teaching point. Yet, the children were also allocated to needs based groups for literacy and numeracy based on diagnostic assessments for more specific instruction and support in small group context. Sometimes individuals or pairs of children would also worked with a specialist teacher if they had particular learning difficulties. The teachers were a cohesive and well organized team with a range of teaching experience from two years to seven years of being in the profession. Their collaborative planning matrix (Appendix 5)

1. Support for numeracy: Recognising and sequencing numerals.

The teachers identified eleven children who, after six months of being in Preparatory class, were unable to; recognize and draw the numerals to 10, indicate the sequence in which they occurred, or respond correctly when asked to identify the number before, or after, a specific numeral. These were foundational conceptual knowledge for the first year of compulsory schooling in the National Curriculum for mathematics (Australian Curriculum and Assessment Reporting Authority, 2012).

We selected number based Apps, based on the findings from phase one of this study, that we felt would enable the children to acquire the knowledge which is considered to be the foundation for later mathematical understandings. We then worked with the children for an hour a week, over six weeks, in order for them to acquire this knowledge and put it into action. They were allocated into two groups by the teachers, so each group had a half an hour session each week.

The Apps used were:

- *Bugs and Numbers* (numeral recognition, sequencing, counting).
- *Bugs and Buttons* (using numbers in games)
- *Insects* (1:1 correspondence, matching how many?).
- *Tally Tots* (recognizing numerals, sequencing, counting to 20).
- *Intro to Math* by Montessorium (tracing and recognizing numerals to 10)
- *Eye Math* (recognizing numerals and filling in missing numerals).

In the first week we started using *Bugs and Numbers* with each group.

illustrates the ways in which they grouped the children in the year level into groups and the content of their lessons in two of the weeks while the data collection occurred.

We worked with the teachers to identify the skills that they felt were their priority for the time period that we were to be there and sought out Apps which were suitable to use in small group contexts (two to six children). We worked with the children in the classroom at a table, in order to use the tablets for focused teaching and learning activity time. Some of the investigations with the small groups of children required activities in the playground area.

The teachers indicated that the following activities were needed:

1. *Support* for number Recognition and sequencing to 10
2. *Extension* numeracy (number stories as eBooks and electronic number sets and creating graphs.

Bugs and Numbers contains six games:

1. **Circus identification** - Recognition of (matching) numerals. In this game the children are given a number/ numeral (and hear the number name). They then have to find (by tapping) all the numerals that pass by them that are pegged on two parallel lines. The game gets faster the more answers you answer accurately, so you are encouraged to move more quickly.
2. **Arcade** - recognition of left and right - the players have to follow the oral instructions to press either right or left in order to navigate a bug/ ant forwards through obstacles. A score is provided in the upper left corner. A final score is provided when the ant crashes into an obstacle
3. **Junk yard** - the player moves items to uncover hidden ladybugs. The number of bugs starts with three and increases as the successful number are uncovered. A tally of the score is provided in the left hand corner.
4. **Diner** - tap and count - bugs appear on a turn table and as the player touches them the number is said and a white numeral appears on the screen. The player then matches that number to a choice of two numerals on the left and as the game goes on the choice of numerals is extended to three
5. **Gallery** - color by numbers. Pictures of bees/ ladybird and snail are all that are provided - have to match numerals and colors and the colors do not go into the areas that might be touched with the child's fingers as they are coloring
6. **Matching shapes** - this starts with numerals in which the player has to drag the like ones together as they are told the names of the numerals. The game then progresses to shapes, then real world (fruit) items, followed by robots in two parts, to animals (caricatures of bees, bugs etc.) that have to be matched and assembled.

The observation notes indicate the sequence of events and interactions with the students were based on *questioning* and *scaffolding* them as they attempted to play the games. In the first session the children were able to play some of the games with assistance, since they needed some help with *recognizing the numerals*, *counting how many* in order to *select the correct numeral*. They were able to play with the *matching game* and the *Arcade game* without assistance. Their enjoyment was shown on their faces and they were very engaged with the graphics and sounds of this well produced game. At the end of the 30 minute session all the children, except two, were able to count to 10, recognize randomly chosen numerals and point to a numeral that came before or after another one.

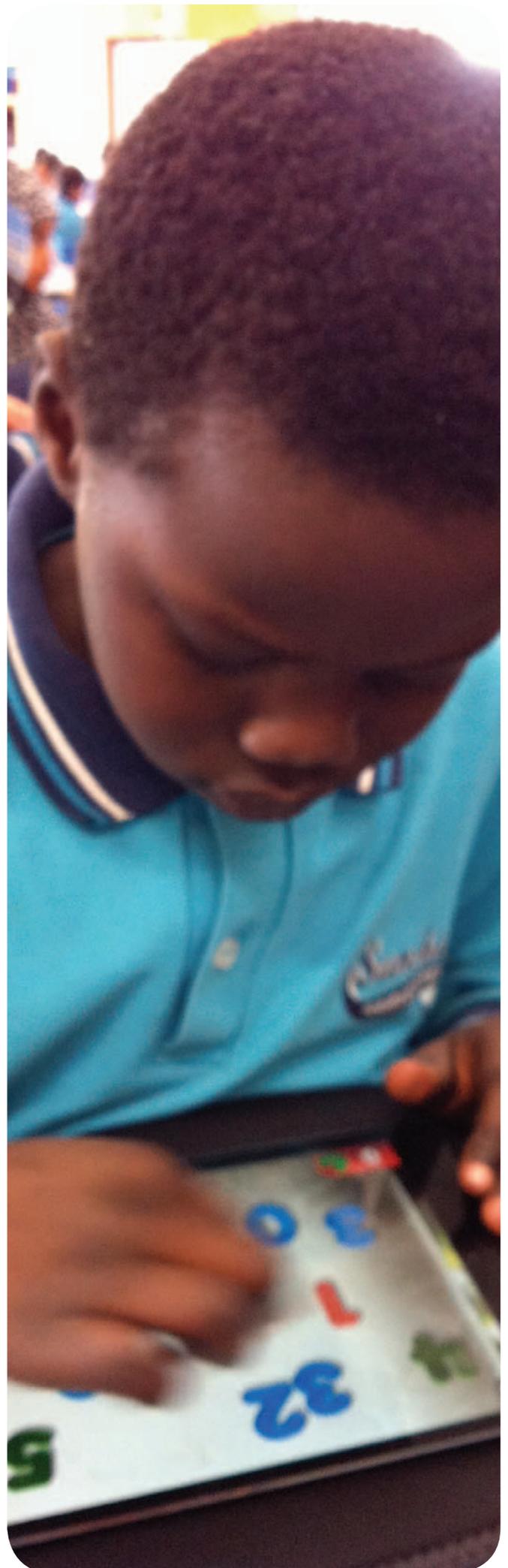
In weeks two to five the children consolidated their understanding about the numbers from 0 to 10 in various activities using the other five apps. In each of the sessions the preservice teacher (Dean) *scaffolded* and *questioned* the children about what they were doing so that he could consider what level of concept attainment they had achieved. Dean's observations indicated that he thought a structured approach, in preference to letting the children choose their own games. He was able to support the children more effectively in this way, catering for individual needs:

A considered plan to integrate iPad use in the math program would map the progression of focus skills across multiple Apps, so that there was a progression path from one App to another in building on those skills.

(Dean Reflections, June 18)

In the final session each child was questioned to ascertain their level of understanding and ability to use numerals to 10, their sequence and their capacity to reproduce each numeral. All of the children except two demonstrated that they could now do these things. The two (boys) who could not demonstrate the concepts, were identified by their teacher as having specific learning difficulties that spanned all curriculum areas. Nonetheless, they could say the numbers in sequence when prompted and were able to trace over the numerals while the App advised them of its number name.

In this way, it was apparent that the dedicated short and focused activity sessions, incorporating the use of the tablet, had a positive impact on the conceptual understandings and skill levels of nine of the eleven children in the group. They had not mastered these understanding in the previous six months of schooling when the content was taught with traditional materials. Focused small group work, which is a common pedagogical technique in Preparatory classes, with a variety of materials might have achieved this sooner. We believe that, ideally, the use of multimodal experiences that incorporate iPads, with manipulative materials, games and writing could have the potential to achieve this earlier on in the school year for these children.



2. Extension numeracy (number stories as eBooks and electronic number sets and creating graphs.

While the group of eleven children had experienced difficulty with recognizing and using the numbers from zero to 10, others in the class had 'mastered' them and moved on to larger numbers from 11 - 20. The National Curriculum (ACARA, 2012) suggests that they should be able to count to 20, recognize the numerals, connect the number names to quantities, compare and order collections, subitise small collections, and represent addition stories.

We wanted to extend the curriculum to include opportunities to use the numbers with language and link to other areas of the curriculum in practical projects that we hoped would engage the children in active learning and applying their knowledge.

Accordingly we provided contexts for learning that included using numbers in stories (comic and visual formats), graphs and in the creation of eBooks that incorporated number. The Apps used were, *Scribble Press*, *MadPad*, and *Comic life*.

Scribble Press enables users to create eBooks that can be saved on the tablet and also shared via email or saved on the web. Knowing about numbers is fundamental to later conceptual understandings in mathematics. Being able to apply number in everyday contexts is an example of being numerate. We worked with the children to create number stories and then to compile them as an eBook incorporating photographs and pictures sourced from the Internet. Preservice teacher, Amy, worked with the children in small groups, while the whole group was engaged in their numeracy rotation.

Before they recorded their stories I asked each child to tell me their story. Each child was able to verbalise their thinking incorporating the relevant mathematical skills (number and addition)...using basic language, '1 cow, 2 dogs, 1 chicken there are 3 animals altogether'.

(Amy Reflections, June)

The variety of topics chosen was considerable with some children choosing to use the clip art and writing their number stories around the various characters (Figure 6) and objects while others preferred to draw their own images (Figure 7).

... He (the student) was successfully able to state the correct amount of items altogether. He began typing his story and was able to locate each letter successfully without guidance from me... if there was a word he was unsure of spelling he would ask... Gradual release of responsibility was used in this learning activity as I initially began the lesson with direct instruction and modeling expectations... but by the final page he was in complete control of his story and choosing the images...

(Amy Reflections, June)

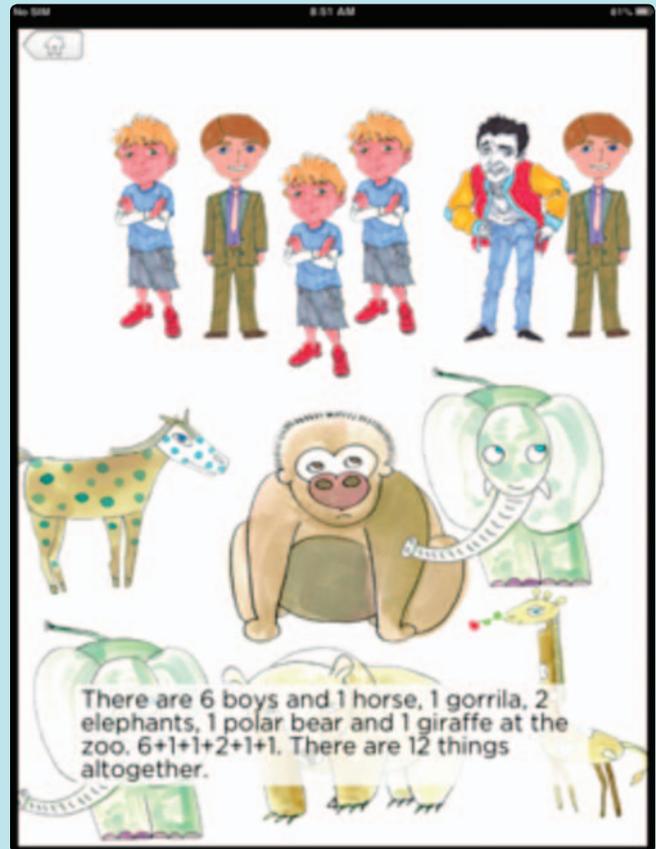


Figure 6: Number stories



Figure 7: Rainbow number story

Modeling played a valuable role... taking D (the student) through what the task required and showing her visually how to create a maths story was imperative for her to understand what she needed to do... D was eager and engaged... I feel she benefited from seeing the work of the other children as she could see what the purpose was and then knew how to apply it to her own book.

(Amy Reflections, June)

As previously stated, the children's contributions were compiled into the eBook that could then be read and shared with the whole group.

Scribble Press also enabled us to introduce the concept of data to the children and then follow this up with the presentation of data in the form of graphs (Appendix 6). We took photographs of fourteen children in the group and then embarked on a data collection to find out various things about them (e.g. what was their favourite farm animal and were they left or right handed?) We live in a data drenched society (Steen, 1999) and becoming fluent with numbers to represent ideas and phenomena is a very important practical manifestation of being numerate.

I modeled a bar graph for them by drawing the vertical and horizontal axes and placing pictures at the bottom. I then asked K (the student) if she would like to draw the lines on a new page. This strategy worked effectively as she performed this with ease. I then showed K and A (students) where the pictures of the animals were, and in turn they navigated and moved the pictures to the correct positions. They then interviewed the children to ask which was their favourite animal... A held the iPad and showed the children their options while K talked to the children. After each one they would sit on the floor to place the photo above the corresponding animal. They took turns and navigated the iPads successfully without any direction needed.

(Amy Reflections, June)

When they had finished interviewing the children, Amy asked the pair which animal had the most amount of people and therefore was the favourite animal. They immediately knew it was the pig and when asked, one of the students said it was because it had the tallest line. The boy student then told Amy that six people liked pigs the best. After this both children accurately counted the number who chose the other animals (horses, dogs, cows, ducks and sheep).

This activity was so valuable for the children's learning. It saw them gain an understanding of graphs and the purpose for them, something which they had not been exposed to before. The social and linguistic aspects of this lesson were evident from the start. K and A (students) worked collaboratively and their confidence grew with each person they interviewed.

(Amy Reflections, June)

The children were going to a farm on the following Friday. Being able to use this as a basis for the activity was a valuable experience for the children. It linked the two tasks together and it made the activity purposeful for their learning.

Moving on from eBooks we wanted an extension activity that would allow the children to represent their ideas and understandings in a different format. *MadPad* allows users to link pictures and sounds in a (4x3) matrix (Appendix 7). The benefits of the App are that it enables children to summarize their learning succinctly in a format that is available on one screen. We designed a learning activity that enabled the children to link numbers with everyday activities. In the first set the children introduced themselves (i.e. Hello my name is... I am six years old...I have long hair... and blue eyes). We then thought about short 'snippets' of information about us. These included; *I have two hands, and two feet and 10 fingers and 10 toes, which makes twenty fingers and toes altogether.* The final matrix can be played in any sequence, and in fact, the sounds and pictures created can almost become musical if played quickly enough.

In the final example of using the tablet to extend children's learning, we decided that it would be beneficial to represent ideas and communicate in a different genre. *Comic Life* enables users to create a comic strip. It allows them to incorporate their own photos and pictures and create text in the comic genre. The preparatory students had not done this before but they knew the genre. When Dean showed them an example and then explained that they were going to make a comic related to a farm visit that they were about to embark upon he described one child as 'eager' and the other two 'reticent'. They talked about their ideas around farms; (e.g.) Who had been to a farm? What they were expecting to see? What are the main jobs on the farm? And related this to their own personal experiences. They planned a story around a hungry sheep called 'Jett' with the preservice teacher, Dean, recording the main ideas that they wanted to include. They were to be part of the story, so they went outside to take photographs and then returned to begin creating their story. The photos were assembled with pictures from the web and assembled with the relevant text (Appendix 8).

The brainstorming of the story was an opportunity for the students to consider any ideas that came to them, without any fear of a 'wrong answer'. The students drew upon their own experiences to contribute to the story... the use of *Comic Life* also allowed them to connect photographs to the words of their story, and include their own physical actions, providing a visible link between the world of language and with the world of their reality... Being able to position speech-bubbles on the picture-panes also encouraged mathematical concepts of design and spatial-awareness.

(Dean Reflections, October)

Summary

In the context of the Preparatory class, we explored the possibilities of using the tablet with the teachers in ways that they believed would support their curriculum and pedagogical work.

In thinking about this in the context of the SAMR model (Puentendra, 2011) it would seem that the work that was planned to *support* the children who had not achieved specific conceptual understandings, had characteristics of all levels of the framework. In this way the tablet was being used as:

1. A direct *substitute* for traditional activities that had not enabled them to understand the concept under review.
2. *Augmentation* for activities that were usually presented in two or three dimensions.
3. *Modifying* those activities that could be offered with basic materials and taking them into a new modality.
4. *Redefining* the ways in which the children could explore number via the context or modality.

However, it was also apparent that it was difficult for the teachers to incorporate the use of tablets without specific and directed additional adult involvement. This came in the form

of the preservice teachers as well as the Educational Assistant (EA) they were allocated for the morning sessions. Yet, the EA's were often not confident in their use of tablets. They were able to build the use of the tablets into their programming, but the implementation required having a preservice teacher working with them to ensure there could be focused teaching. This was despite the fact that the children became fluent with the technology very easily and quickly. Thus, while the tablet had the potential to transform learning and teaching, the implementation was problematic from a practical perspective.

This was even more evident for the extension activities, which used more open-ended Apps. These Apps were more complex to understand and use, unless you had the opportunity to practice working with them. While the preservice teachers had time to do this and were able to withdraw the children from the numeracy rotations, these enriched learning contexts were more of an 'add on' to existing practice, rather than transforming the whole range of experiences in the classroom. Nevertheless, both in terms of supporting and extending the children's numeracy learning, the tablet-based activities more than achieved the learning and engagement goals set.



CONCLUSIONS

The data from this study supports the contentions that:

1. Preservice teachers and teachers can work collaboratively to incorporate tablets into their **pedagogical repertoires** to compliment each others' teaching skills. They achieved this by creating contexts for learning activities that occurred at the individual, small group and whole group levels. Working collaboratively in a pedagogical partnership engendered confidence in using tablets with young children.
2. **Multimodal learning** is facilitated when tablets are used in early childhood contexts.
3. Opportunities for learning with tablets can be **transformative** and enable modification and redefinition of traditional activities with dynamic and positive learning outcomes.
4. **Professional learning** contexts can be designed to share exemplary practices that build on, extend and transform traditional learning via disruptive pedagogies that enable new ways of thinking about multimodal learning that facilitate 21st century skills.



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Transformation

Redefinition

Tech allows for the creation of new tasks, previously inconceivable

Modification

Tech allows for significant task redesign

Transformation

Augmentation

Tech acts as a direct tool substitute, with functional improvement

Substitution

Tech acts a direct tool substitute, with no fuctional change

Appendix 2: Kindergarten iPad Apps - Learning Snapshot

APP NAME	LITERACY				NUMERACY				CREATIVE				SKILLS			
	Letter Recognition	Phonics	Words	Reading	Counting	Sorting/Classify/ign	Matching	Spatial	Add/Sub	Draw/Colour	Story Making	Scene Making	Design	Music Making	Fine Motor	Time Limit
Scribble Press	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
My Story	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
Book Creator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
Play School Art Maker					✓	✓	✓	✓		✓	✓	✓	✓		✓	
Jigsaw Maker					✓		✓	✓				✓			✓	
MacPad	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	
Tally Tots					✓	✓	✓	✓							✓	
Montessorium Letters	✓	✓		✓					✓						✓	
Montessorium Numbers					✓	✓	✓	✓		✓					✓	
Peppa's Pig - Fun at the Fair	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓	
Teddy's Day	✓		✓	✓	✓	✓		✓			✓	✓			✓	
Teddy's Night	✓		✓	✓	✓	✓		✓			✓	✓			✓	
Sandbox						✓					✓	✓	✓		✓	
Doc McStuffins											✓	✓			✓	
Sock Puppets											✓	✓			✓	

- **Sorting/Classifying** includes: sorting/pairing objects, number ordering, colour classifying, object classifying and patterning
- **Spatial** includes: size, shape & volume identification, angles and mazes
- **Matching** includes: puzzles and memory cards

Appendix 2: Preparatory Class iPad Apps - Learning Snapshot

APP NAME	LITERACY					NUMERACY					CREATIVE					SKILLS	
	Letter Recognition	Phonics	Words	Reading	Counting	Sorting/Classify/ign	Matching	Spatial	Add/Sub	Draw/Colour	Story Making	Scene Making	Design	Music Making	Fine Motor	Time Limit	
Scribble Press	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
Book Creator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
My Story	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
MadPad			✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		
ComicLife	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓		
Bugs & Numbers	✓			✓	✓	✓	✓	✓							✓		
Bugs & Buttons	✓				✓	✓	✓	✓							✓		
Tally Tots					✓	✓	✓	✓							✓		
Alpha Tots	✓		✓				✓								✓		
Montessori Intro to Numbers					✓		✓	✓							✓		
Montessori Intro to Letters	✓	✓					✓								✓		
Sock Puppets										✓	✓	✓	✓		✓		

- **Sorting/Classifying** includes: sorting/pairing objects, number ordering, colour classifying, object classifying and patterning
- **Spatial** includes: size, shape & volume identification, angles and mazes
- **Matching** includes: puzzles and memory cards

Appendix 3: A Kindergarten Learning Story

Learning Story 1 (Jenna)

(Adapted from Carr, M. (2001). *Assessment in early childhood settings: Learning stories*. London: Sage.)

Learning outcomes	Examples or cues to demonstrate this	A Learning Story
Children have a strong sense of identity	<ul style="list-style-type: none"> • feels safe, secure and supported • develops their emerging autonomy, inter-dependence, resilience & sense of agency • develop knowledgeable and confident self identities • learn to interact in relation to others with care, empathy and respect. 	The children (5 boys) showed an interest in the sounds and pictures from <i>MadPad</i> sets stored on the iPad. After demonstrating the features to them we talked about what sounds we could make with our bodies. Allan said "what about this sound?" and made a clicking noise with his tongue. "What about clapping?" asked Brendan as he did the motion.
Children are connected with and contribute to their world	<ul style="list-style-type: none"> • Sense of belonging to group • Respect diversity • Recognise fairness • Socially responsible • Show respect. 	We then walked around thinking about other sounds we could make with objects around us. Allan stood on the swing and said "Look at this sound!" He picked up two pots in the sandpit and began banging them together. "we can use this sound!" Later, when entering the sounds the boys made sure everyone had a turn.
Children have a strong sense of wellbeing	<ul style="list-style-type: none"> • Strong social & emotional well being • Increasing responsibility for own well being 	The boys were able to find an array of sounds to use for the mad pad collection and we recorded the video of them making the sounds in two sets. They were able to recognise what sounds would work and which ones were too soft - since in the playground noise levels tend to be elevated.
Children are confident and involved learners	<ul style="list-style-type: none"> • Develop dispositions for learning • Skills of learning - exploring & investigating • Transfer across context • Resource own learning in variety of contexts 	The group was able to take turns and listen to each other and share their sound discoveries. They waited while some technical difficulties around recording sound levels were fixed and then played back the sounds for each other to listen to.
Children are effective communicators	<ul style="list-style-type: none"> • Interact with others • Engage with range of texts & make meaning • Express ideas in range of media • Use symbols to express ideas • Use ICT for learning. 	The mad pad sets contained the sounds that the boys made outside in the play areas. They waited while this process took place and shared their final products with their peers - explaining how they made it as they played the sets of pictures and sounds.

Short term review

This App was open ended so that the children were able to create their own sets using the photos and sounds around them. They were confident in their approach to the task and sustained interest over a lengthy time span that involved some technical difficulties. Creating the 'local' sets enabled them to feel connected to their environment from a different perspective and think about the various sounds and images that are connected in our daily lives.

Appendix 3: A Kindergarten Learning Story

Learning Story 2 (Jess)

(Adapted from Carr, M. (2001). *Assessment in early childhood settings: Learning stories*. London: Sage.)

Learning outcomes	Examples or cues to demonstrate this	A Learning Story
<p>Children have a strong sense of identity</p>	<ul style="list-style-type: none"> • feels safe, secure and supported • develops their emerging autonomy, inter-dependence, resilience & sense of agency • develop knowledgeable and confident self identities • learn to interact in relation to others with care, empathy and respect. <p><i>Brianna, Charlie, Obe, Jemma, Tilly, Agness, Charlotte, Lilly, Chelsea, Aiden, Maryanne, Lina, Jameson:</i></p>	<p>We used the iPads to create a story called "My Name Is..." using the <i>My Story</i> App. I helped the children to take a photo of themselves and explain to them we were creating a book to be able to show our parents and other class members a story book with a photo of ourselves and a voice recording stating something we were good at. The eBook ended up with individual 13 entries. Each child came up with something they were good at. They also used the draw feature in <i>My Story</i> to decorate their faces on their photo with their favourite colours and unique patterns.</p> <p>This e-book was a fantastic way for children to recognise something that they were good at and it gave them the opportunity to share it with their classmates, educators and families.</p>
<p>Children are connected with and contribute to their world</p>	<ul style="list-style-type: none"> • Sense of belonging to group • Respect diversity • Recognise fairness • Socially responsible • Show respect. 	<p>The children worked together and waited for each person to have a turn and tell their story. They seemed to be interested in what everyone was doing as demonstrated by waiting & listening.</p>
<p>Children have a strong sense of wellbeing</p>	<ul style="list-style-type: none"> • Strong social & emotional well being • Increasing responsibility for own well being 	<p>Each of the children were excited to have their photo taken and see their image on the screen. They were all able to follow brief instructions in recording their names where once I pressed the record button they would say "My name is.... And I am good at...". Once they recorded their voice they had the opportunity to decorate their photo, many of the children enjoyed this part most and each of their pattern designs and colours were unique and a reflection of their personalities.</p>
<p>Children are confident and involved learners</p>	<ul style="list-style-type: none"> • Develop dispositions for learning • Skills of learning – exploring & investigating • Transfer across context • Resource own learning in variety of contexts 	<p>Brianna was first to record her name and have her photo taken, although she has a mild speech impediment and her first recording it was a little difficult to hear. With a little encouragement and a second go at recording she said "My name is Brianna and I love my Mum and my baby sister." She went onto taking a great amount of time and care in decorating her photo in colours that she liked.</p> <p>Charlie was more than enthusiastic to have a go on the iPad and his excitement is evident through his recording, "My name is Charlie and I am good at riding bikes". Once Charlie recorded his statement he decorated his photo. Charlie did not want to stop here though and if we didn't have to make other entries in the book Charlie would have created much more of his own entries or played other educational apps.</p> <p>It was Obe's turn next and at the time he was playing with some leggo on the class mat, so it was more than appropriate when he recorded "My name is Obe and I am good at building leggo".</p> <p>When I approached Jemma and Tilly they were both enjoying morning tea together and chatting away, I explained the brief to them and both of their recordings explained that they were both "good at painting" Jemma took me away to see one of her paintings that she had done at the start of the day, it was great that</p>

Learning outcomes	Examples or cues to demonstrate this	A Learning Story
		<p>she could relate to something she had done during the day and recognize for herself that yes she was good at painting and be proud of her work.</p> <p>Agnes approached me and asked if she could have her photo taken, she explained that she “liked to colour in” and this was very evident when it came to decorating her photo.</p> <p>Charlotte was next to make an entry where she stated “My name is Charlotte and I am good at drawing”.</p> <p>I took the iPad outside to make some more entries and approached Lilly and Chelsea and showed them some of the other children’s entries. They both recorded their voices and stated that they were both “good at climbing”... coincident or not, they were currently climbing the playground equipment in attempt of avoiding the lava (grass).</p> <p>It was Aiden’s turn next, “My name is Aiden and I am good at setting up the table”, it was great that Aiden was able to identify something within his home that he enjoyed doing and thought he was good at. Aiden decorated every part of his photo where he explained he was turning his face into a lion.</p> <p>Maryanne, although having a quiet voice was very excited to have a go at having her photo taken and said she was “good at drawing”. Maryanne enjoyed decorating her photo and giggled as she was able to switch from colour to colour.</p> <p>Tina had difficulty in recording something about herself but for her to be an active contributor was impressive to see. Tina made a recording where she said “My name is Tina, my name is Tina”. It was great that Tina could be a part of the book too.</p> <p>Jameson was the last to make an entry in the e-book where he stated “I love footy and I love football”. Jameson explained to me that he loved the bulldogs because his Dad used to play for them, this would be a great entry for Jameson to be able to share with his Dad.</p>
<p>Children are effective communicators</p>	<ul style="list-style-type: none"> • Interact with others • Engage with range of texts & make meaning • Express ideas in range of media • Use symbols to express ideas • Use ICT for learning. 	

Short term review

Creating the e-book ‘My Name Is...’ was a fun, exciting and modern way for children. Recording something positive about themselves in order to share with their families and friends was good for their self-esteem. It focused on the children being able to recognize something positive about themselves as they had been focusing on that aspect in other parts of their learning. For each child to be able to decorate their page with the additional features built into the program meant that they converted their photo to something original that reflected their personality.

At times the noise level in the kindergarten made it difficult to hear the recordings but the children were more than happy to record a second time once the noise had abated. The recording proved to be the most difficult part of the experience because of background noise. It was heartening to see those children who were unsure about using the technology smile and laugh once they listened back to their recordings.

All of the children proved they were excellent in sharing their time and outcomes. They were able to respect each other as they waited for their turn and even complimented each other’s decorations as they were engaged in creating them.

Overall this experience was a complete success and they were all excited to share the eBook with everyone in the centre.

Appendix 3: A Kindergarten Learning Story

Learning Story 3 (Nicola)

(Adapted from Carr, M. (2001). *Assessment in early childhood settings: Learning stories*. London: Sage.)

Learning outcomes	Examples or cues to demonstrate this	A Learning Story
Children have a strong sense of identity	<ul style="list-style-type: none"> feels safe, secure and supported develops their emerging autonomy, inter-dependence, resilience & sense of agency develop knowledgeable and confident self identities learn to interact in relation to others with care, empathy and respect. 	<p>Today we decided to use the iPads to make an electronic book called About us. Nicky had indicated that she did not want the children to just use iPad Apps so we came up with the idea of the eBook made with <i>Story Maker</i> - because the children could record their ideas and we could accompany this with typing the words so that they could see the connection between the oral and linguistic/ visual modalities. We saw this as an opportunity for the children to create a personal book that contained their photo - their name, what they liked doing and what they were good at.</p> <p>Maryan, Brianna, Tilly, Charlotte, Jemma, Tina.</p> <p>Maryann was playing with the iPad when I arrived. She was playing with the Montessori letters and numbers and moved on to the bugs and numbers game. She played each one with ease and demonstrated that she was consistent and proficient in the skill level implicit in each game. That is recognising the letter name and sounds and numerals to 10</p> <p>All of the children were able to follow the instructions to say their name, what they liked to do and what they felt they were good at Tina has been diagnosed as being on the autistic spectrum. She had virtually no language and could only say her name - but this was an achievement to get as a recording. Brianna and Maryan had very quiet voices and this was difficult to capture in audio since the kg room had high noise levels.</p> <p>Brianna also has a mild speech impediment which meant that it was difficult to hear the words. At the same time she had difficulty articulating what she was good at I wrote each of the 3 sentences that the children told me. As we were making the book more children came around and wanted to participate after the first two children were invited.</p>
Children are connected with and contribute to their world	<ul style="list-style-type: none"> Sense of belonging to group Respect diversity Recognise fairness Socially responsible Show respect. 	
Children have a strong sense of wellbeing	<ul style="list-style-type: none"> Strong social & emotional well being Increasing responsibility for own well being 	
Children are confident and involved learners	<ul style="list-style-type: none"> Develop dispositions for learning Skills of learning - exploring & investigating Transfer across context Resource own learning in variety of contexts 	
Children are effective communicators	<ul style="list-style-type: none"> Interact with others Engage with range of texts & make meaning Express ideas in range of media Use symbols to express ideas Use ICT for learning. 	

Short term review

This proved to be a viable learning activity for this group of 4 year old kindergarten children who were in a play based programme. The children were initially invited to join the activity and as it progressed there was interest from others who came to see what was going on and then joined in. Once we had the group of six done - it became a practical book that could be read and the personalised nature of it made it interesting for each child. It was good to have the initial focus on the child's name, what they like and what they felt they were good at as this provided a useful context for the work. Though the noise level in the centre made it difficult to hear in some locations being able to type the accompanying words meant that when the book was read the reader was able to understand the text.

Tilly indicated she was good at 'smoothing' and when I asked her (not recorded) what this was she showed me with her hands by putting them together in a fluid movement across each other - and said I can make things smooth!

The children waited patiently for their turn, they listened carefully to instructions and showed a fluency with organising their ideas ready for the recording.

Appendix 3: A Kindergarten Learning Story

Learning Story 4 (Jess)

(Adapted from Carr, M. (2001). *Assessment in early childhood settings: Learning stories*. London: Sage.)

Learning outcomes	Examples or cues to demonstrate this	A Learning Story
Children have a strong sense of identity	<ul style="list-style-type: none"> feels safe, secure and supported develops their emerging autonomy, inter-dependence, resilience & sense of agency develop knowledgeable and confident self identities learn to interact in relation to others with care, empathy and respect. 	<p>The children had previously made an eBook and showed great interest in doing so. I decided to ask them if they wanted to make another eBook for them to share in their classroom & with their parents. This time they would talk about what they were playing and doing.</p> <p>The eBook was to be called "Today I am playing with.." This book was aimed in capturing the children play - indoors and outdoors. Photos could do this but the added feature of sound and text would make it more dynamic. This App (My story) is a great resource for educators to have on display in the room throughout the day to share with the other children and it's also a way of showing families at the end of the day what the children have been doing.</p>
Children are connected with and contribute to their world	<ul style="list-style-type: none"> Sense of belonging to group Respect diversity Recognise fairness Socially responsible Show respect. 	<p>The first entry within the eBook was a photo of Oliver and Obe, who were playing with the playdough using scissors, rolling pins and cutters. I asked Oliver what he was making and he explained to me he was making "corn for Obe".</p> <p>April too was playing with the playdough and creating something using scissors, she at first was reluctant to tell me what she was making and explained it was a secret but then went into detail, giving me hints such as "it is something that flies...", turns out it was a hot air balloon.</p>
Children have a strong sense of wellbeing	<ul style="list-style-type: none"> Strong social & emotional well being Increasing responsibility for own well being 	<p>I found Charlotte and Chelsea outside playing by the bushes, when I approached them they were more than happy to pose for a photo and when asked what they were making they explained they were making a fire out of "sticks, leaves and berries".</p>
Children are confident and involved learners	<ul style="list-style-type: none"> Develop dispositions for learning Skills of learning - exploring & investigating Transfer across context Resource own learning in variety of contexts 	<p>Aggy too was playing with the playdough and explained she was making cookies "out of love hearts". I sat with Aggy for a while whilst she decorated her photo in spots and continued to make me love heart cookies to eat.</p>
Children are effective communicators	<ul style="list-style-type: none"> Interact with others Engage with range of texts & make meaning Express ideas in range of media Use symbols to express ideas Use ICT for learning. 	<p>Aiden was constructing something in the sandpit with cones traffic signs, it began to look like he was building a house, he was reluctant to record what he was making but did confirm it was house.</p>

Short term review

Creating this eBook was an enjoyable way of displaying what the children had been learning in their play from their perspective. It captured forms of social, imaginative and creative play and although it required a lot of focussed questioning from me to get the recordings the images posted - it was apparent that the children enjoyed participating and sharing the final product. It will be a great resource for all members of the community to reflect upon.

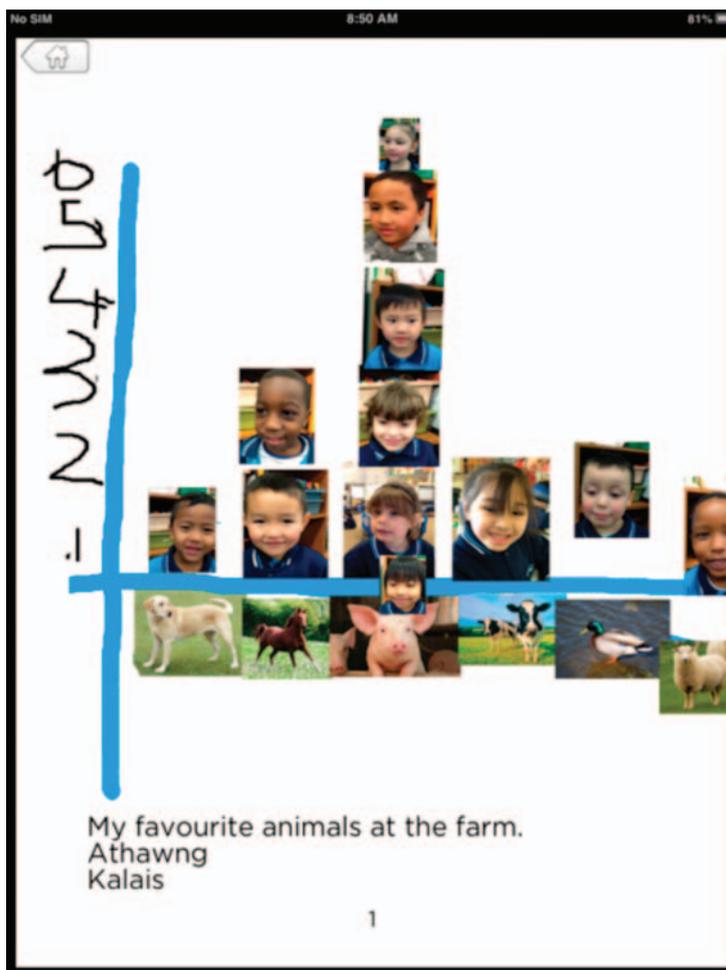
Appendix 4: MadPad in Kindergarten



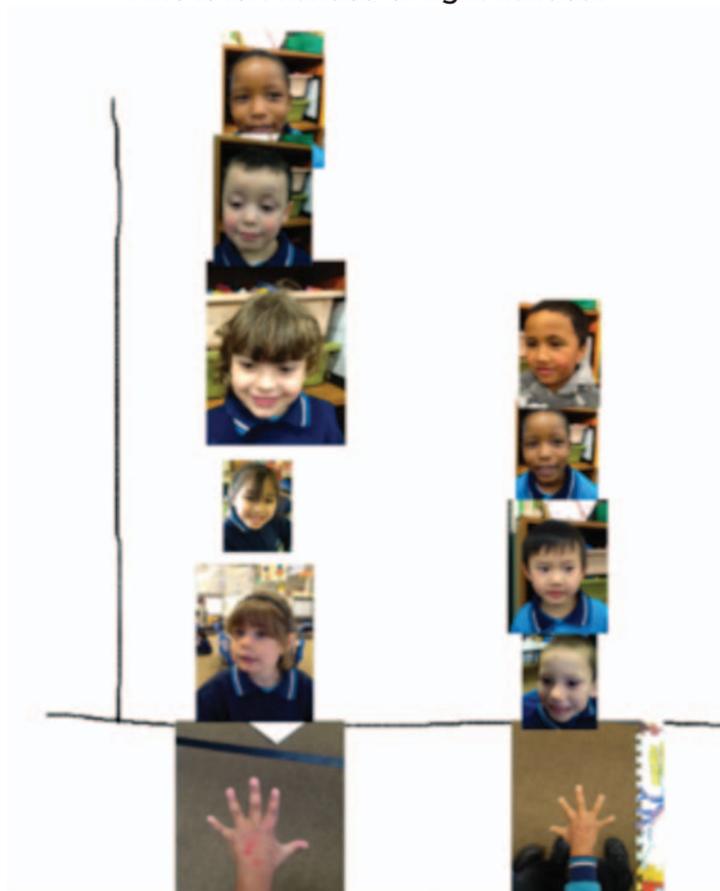
Appendix 5: Example Numeracy Lesson Plan - Preparatory Class

MATHS				
Lesson Objective/s	To recognise numbers <i>after</i> a given number to 10 Recording numbers - To use the numbers 1 – 10 in number stories (extension)			
Resources Required	Function Rex, Number cards, Number lines, Mini whiteboards, Markers			
Team Teaching Approach	<i>Alternative Teaching</i> – One teacher takes majority of the group, while the other teacher's instruct small groups.			
	1. Monique (Teacher)	2. Rebecca (Teacher)	3. Dean (Pre Service Teacher)	4. Amy (Pre Service Teacher)
Whole group activity	Give 10 students number cards to create a human number line. Discuss who is after you in the line and what number they have. Use Function Rex with the rest of the group.	Give 10 students number cards to create a human number line. Discuss who is after you in the line and what number they have. Use Function Rex with the rest of the group.	iPad games – <i>Bugs and numbers/ Bugs and Buttons</i> . Recap on games available	Introduce activity to children by modelling number stories and show them how to use <i>Scribble Press</i>
Small group activity	Number line Bingo. Provide students with a number line to 10. Have them draw a 2 x 3 grid on their whiteboard and put six numbers inside it. Do you have the number before 3? Do you have the number before 10.	Number line Bingo. Provide students with a number line to 10. Have them draw a 2 x 3 grid on their whiteboard and put six numbers inside it. Do you have the number before 3? Do you have the number before 10.	Children work independently on self selected games in Apps. Teacher to monitor use of number and numeral recognition via questions (see below)	Children create an electronic 'maths book' in pictures using scribble press. Children use their knowledge of addition to develop number stories. Children attach number stories to illustrations. Teacher to assist in spelling and scaffolding their mathematical understandings about number and addition.
Reflection	How does a number line help you to find out which Numbers comes before another number?	How does a number line help you to find out which Numbers comes before another number?	What is this numeral? How many bugs did you find? What is the next number after 5? What colour do you use for 4? (in number colouring) Show me the numeral 6. Count all the bugs in this picture? Which numeral matches this one?	How can we use our maths thinking to create a maths story? In what ways can we apply number and addition knowledge to everyday contexts and applications?
Teacher comments			Most of the children can count in sequence but need more experience in recognition of numerals as well as figuring out the number after/ before in the sequence. Careful attention to detail and repetition needed to consolidate	The children successfully used their understanding of addition to create mathematical stories. The children were engaged and focused and the activity allowed them to place addition in real life contexts. To further scaffold this understanding bar graphs will be introduced with the focus of addition.

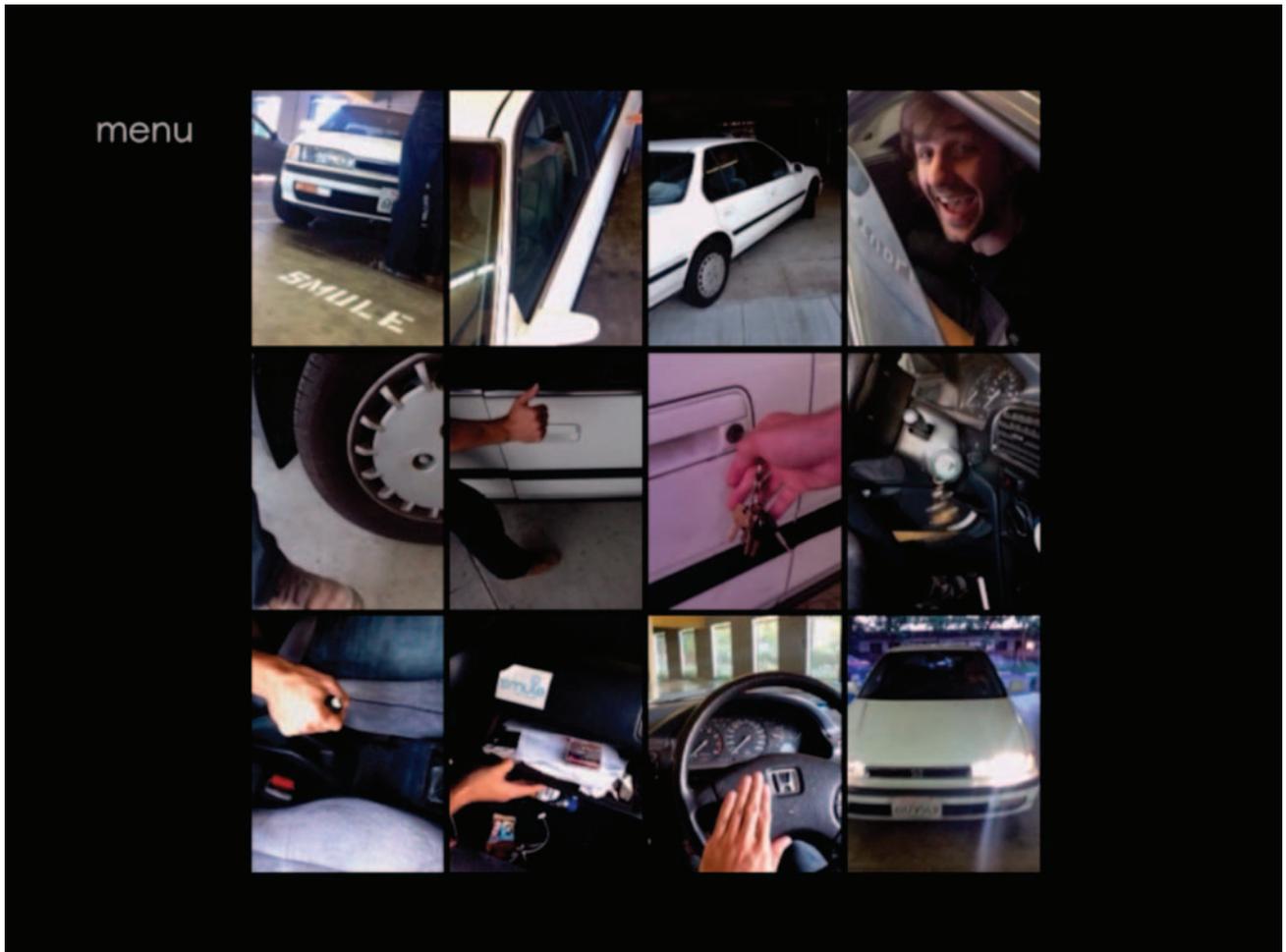
Appendix 6: Making graphs and reading data



Who is left handed or right handed?



Appendix 7: *MadPad* in the Primary School



JETT, THE HUNGRY SHEEP

Once, three stud visit from Sunshine Harvester Primary, named Christmas, Tanzin and Sarah, went to visit a farm on an excursion...



THIS PLACE IS AMAZING.

IS THAT A SHEEP?



WHAT ANIMALS WILL WE FIND?

It was a sheep... A very hungry sheep because he did not like eating grass, named Jett...



DO FINGERS TASTE GOOD?

Christmas, Tazim and Sarah were afraid that Jett, the hungry sheep might eat their...fingers!!!

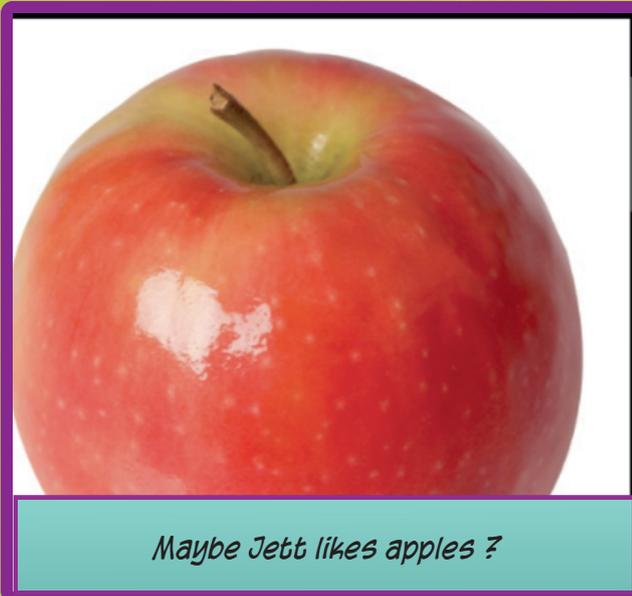


But Jett did not budge and looked more hungry!



But Jett followed them...and he was very fast!







TRY MY CHOCOLATE?



Maybe Jett likes chocolate?



I DON'T LIKE CHOCOLATE!



Would Jett like to eat a tree???



THIS SHOULD FILL HIM UP!

ALL TOGETHER... LIFT!



I LIKE EATING TREES, AND NOW I FEEL FULL...

Jett Felt so Full he had to take a long nap...



ZZZZZZZZ

LETS SNEAK AWAY QUIETLY...



At last Christmas, Tanzin and Sarah were free to explore the farm in peace...

YES, WE ALL HAD GREAT IDEAS.

THAT WAS GREAT TEAM WORK.

NOW WE CAN HAVE SOME FUN!

THE END.

iPads in the Early Years

USING IPADS EFFECTIVELY IN THE EARLY YEARS

**Friday October 25 @Truganina South
21stCentury PD Centre 9:15am - 3pm**



- In what ways can iPads be effectively integrated into my early years program?
- How can I use iPads to promote multimodal learning and higher order thinking skills?
- How can I select Apps that will promote learning from the huge range available?
- How can I work with parents to extend our work with iPads beyond the classroom?
- What activities can I start with to encourage the use of new technologies like iPads for learning.

- [**REGISTER ONLINE HERE**](#)

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