Effective Learning in Early Childhood Education?

The Impact of the ECE ICT PL Programme: A Synthesis Report

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EXECUTIVE SUMMARY

A framework to guide the effective use and investment of Information and communication Technology (ICT) in Early Childhood Education (ECE) services was initiated by the Ministry of Education and launched in April 2005. The framework, entitled *Foundations for Discovery* (Ministry of Education, 2005), was developed against a backdrop of other Government initiatives. These included the ECE Strategic Plan – *Pathways to the future: Ngā Huarahi Arataki* (Ministry of Education, 2002) – which had three overarching goals for the sector – to increase participation, improve quality, and promote collaborative relationships.

The *Foundations for Discovery* framework recommended five strategic focus areas for action, one of which was to develop teacher professional learning and capability in ICT. This was in recognition of ECE educators having a critical role in the appropriate and effective use of ICT in ECE services through careful planning, modelling and creation of meaningful learning experiences. As a result the Ministry of Education initiated and funded a three-year programme for teacher professional development. This has been managed and facilitated by CORE Education.

This report provides an overview of the impact of the Early Childhood Education Information and Communication Technologies Professional Learning (ECE ICT PL) programme, 2006–2009.

The purposes of the report are twofold:

I. To synthesise the main findings that emerged from fifty-six action research projects undertaken by teachers during the programme. In these action research projects, teachers collaboratively investigated a range of 'puzzles of practice' with respect to integrating new technologies into their service programmes. The focus of these enquiries and reports was on identifying the learning outcomes involved in a variety of ICT-based learning activities.

II. To summarise the results of three surveys of participating services and teachers (baseline, mid-point and end-of-project). The survey results provide a quantitative overview of the main 'national trends' in the impact of the ECE ICT PL programme as a whole on participating teachers and services.

The action research projects

Fifty-six written action research reports were received from a total of 60 services. These describe in detail the particular aspects of eLearning that each investigated, the evidence base gathered, and their main findings or conclusions. Brief synopses of all services' action research projects are attached to this report (Appendix 2).

The action research projects varied in quality as pieces of formal research, but were universally rigorous in their reflective qualities and useful as evidence-based accounts of the services' eLearning practices. Perhaps most importantly, they provide strong accounts of how a range of ICTs might be used to improve learning outcomes for children, communities and teachers in ECE settings.

The most prominent and pervasive finding of the action research studies was that eLearning or ICT-based activities have significant benefit potential with respect to:

- enhancing children's learning
- helping services connect with their communities

- improving the quality of teaching
- realising that potential lies less in *which* technologies are used and more in *how* they are used.

New technologies provide significant opportunities and affordances for learning and social connection in ECE settings, including that which would be impractical or impossible otherwise, but they do not guarantee these outcomes independent of the pedagogical and social contexts within which they are used.

A second high-level finding is that such learning and social connection outcomes are likely to be greater when children use the technologies themselves, or when they have some measure of control over which, how, and why, various ICTs are used.

In investigating their own eLearning activities, the teachers were encouraged to focus their data gathering and analysis on identifying the types of *learning* or other *outcomes* that might be observed when teachers and children used ICTs in various ways and for differing purposes.

The investigations can be grouped as:

- studies of learning outcomes for children
- studies of connection outcomes with respect to parents, whānau and the wider community
- studies of professional learning outcomes for teachers themselves.

In particular, the studies of children's learning identified positive outcomes with respect to:

- thinking skills and disposition to enquiry
- cultural awareness
- literacy learning and communication skills
- agency and sense of self as learners
- a range of affective domain outcomes such as confidence, motivation and sense of belonging.

The studies of community connection identified positive outcomes with respect to parent and whānau understanding of their children's learning, improved relationships and increased connection between services and their community, and children's transitions both within and between services and schools.

The studies of teachers' own professional learning found that, although challenging and initially uncomfortable, using new technologies (notably videos of teaching sessions) as a stimulus for their own reflection and learning could:

- enhance their own disposition to be professionally self-critical
- persuade them to give more 'autonomy' to children in their learning activities
- lead to their changing/improving specific pedagogical practices or habits.

The surveys

Teachers and services were surveyed about their eLearning practices at three points in the programme: early in 2007 (baseline survey), June 2008 (mid-point survey), and October 2009 (end-of-project survey).

The comparison of baseline and end-of-project surveys, in particular, provides a record of changes in teachers' and services' eLearning practices over time, and also allows identification of some general trends across all teachers and services involved in the programme.

The main findings from the surveys:

- Services significantly increased their stocks of computers and other ICTs over the period of the programme, and most of this increase involved more ICTs being located in play areas. Among the hardware that increased the most were laptops, digital still and video cameras, webcams, digital microscopes. Mobile devices such as cell phones and iPods seem little used.
- Almost all services have broadband Internet access and the great majority of services (91%) provide Internet access via wireless networking throughout the service.
- Both ICT-use for learning and ICT-capability of staff and children increased significantly over the period of the project. Prominent among the usage trends was:
    - a significantly greater use of ICTs by children themselves
    - greater use of ICTs for learning and learning-related activity (as opposed, for example to use for administration)
    - and increased use of ICTs to communicate with parents and whānau.
- Throughout the programme the most frequent use of ICTs for learning by children was for the documentation of their learning, especially through the use of digital cameras and the co-writing of learning stories. However, use of ICTs for creative activity (story writing, making pictures etc) increased significantly over the period of the programme as well.
- Teachers identified a wide range of gains from the programme, the most prominent of these being:
    - deeper pedagogical knowledge
    - substantial increases in their own confidence and competence
    - increased use of ICTs for a variety of curriculum purposes
    - a much greater focus on the children themselves using ICTs for learning
    - more critically reflective practice on their part as teachers.

INTRODUCTION

BACKGROUND TO THE ECE ICT PL PROGRAMME

The *Foundations for Discovery* (Ministry of Education, 2005) framework is designed to guide the effective use and investment of ICT in ECE, and was developed against the backdrop of Government initiatives such as the ECE Strategic Plan – *Pathways to the future: Ngā Huarahi Arataki* (Ministry of Education, 2002). Also pertinent to the framework development was a *Draft New Zealand Digital Strategy* (Ministry of Economic Development, 2004), aimed at increasing ICT literacy across the New Zealand population as a whole, in order to realise the nation's economic, social and cultural goals in the 21st century. The framework also supported the education goals and outcomes of *Te Whāriki* (Ministry of Education, 1996).

Foundations for Discovery (Ministry of Education, 2005) is neither mandatory nor prescriptive and does not set expectations about the type or amount of ICT that services should have. Rather, the framework consists of six principles, formulated to guide the use of ICT for both pedagogical and administrative purposes. These state that ICT should:

- take a learner-centred approach
- uphold the principles of *Te Whāriki* (Ministry of Education, 1996)
- be led by and share good practice and research
- maximise opportunities for collaboration and innovation
- encourage sustainability and affordability
- recognise and address issues of safety and appropriateness.

The *Foundations for Discovery* (Ministry of Education, 2005) framework recommended five strategic focus areas for action, one of which was to develop teacher professional learning and capability in ICT. This was in recognition of ECE educators having a critical role in the appropriate and effective use of ICT in ECE services through careful planning, modelling and creation of meaningful learning experiences. As a result the Ministry of Education initiated and funded a pilot programme for teacher professional development. This has been managed and facilitated by CORE Education (www.core-ed.net). The Early Childhood ICT Professional Learning (ECE ICT PL) programme began in late 2006 and involved a total of 67 early childhood services throughout New Zealand.

The programme was initially established as a pilot, with the intention being that subsequent rounds of professional development would be adapted according to what was learned from the pilot. In particular, the programme was to give further direction as to the benefits of incorporating ICT within services and on the characteristics of effective professional development models. However, eighteen months into the programme, CORE Education was informed that further rounds would not proceed due to changes in Government policy.

Literature and research that guided the programme

A review of New Zealand and international literature on the role and potential of ICT in early childhood education (Bolstad, 2004) proceeded and informed *Foundations for Discovery* (Ministry of Education, 2005). In this review, Bolstad (2004, p.5) suggests that ICT matters in early childhood education because it offers considerable opportunities to "…transform, the activities, roles and relationships experienced by children and adults in early childhood settings".

It also matters because ICTs are already present in children's lives through the people and environment that surround them. Bolstad drew on Siraj-Batchford & Siraj-Batchford's (2003) definition of ICT as a basis for reviewing the literature.

This states that ICT is:

> *Anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment.*
>
> (Siraj-Blatchford & Siraj-Blatchford, 2003, p.4)

This all encompassing definition was the approach taken from the outset of the ECE ICT PL programme. The notion that ICT is about much more than computers, incorporating anything from digital cameras through to the use of the Internet and devices such as digital microscopes, data projectors and interactive whiteboards.

Opinion has been divided in the literature as to the efficacy of including ICTs in early childhood education contexts. Those most opposed to its use (Alliance for Childhood, 2000; Monke, 2006) cite the concern that ICT deprives children of their childhood by discouraging physical and social activity, direct experience and unstructured play. Interestingly, a second report (Alliance for Childhood, 2004) takes a less hard line, acknowledging that ICT and multimedia are here to stay and therefore what is needed is new thinking around building respect and critique of technology.

> *If we teach them [children] only a blind enthusiasm for technology, how will they learn to think and act creatively and critically?*
>
> (Alliance for Childhood, 2004)

Much of the critique and research, in general, undertaken on ICT has focused on children using desktop computers with proprietary 'edutainment' software. This represents quite a different use of ICT from that advocated through *Foundations for Discovery* (Ministry of Education, 2005) or used by the services in their research.

The speed with which digital technologies are changing presents a number of challenges, one of which is that the research and commentary surrounding these technologies struggles to keep up with the rate of innovation. For example, literature espousing the value of blogging and using voice-over protocols such as Skype with young children has yet to emerge, although the mechanisms themselves have been available for some years now. The use of digital cameras has had some traction (Clark, 2005), although often the focus has been on the teachers' rather than the children's use of these.

What is known through research about the value of ICT with regards to children's learning, therefore, must be understood in the context of these limitations.

Studies undertaken in early childhood contexts (Lee and O'Rourke, 2006; O'Hara, 2008; Stephen & Plowman, 2003) all found that, contrary to claims that ICT isolated children, its inclusion stimulated social interaction, oral language and peer tutoring because children naturally prefer to work together. These same authors also referred to the motivating effect ICT can have on 'at risk' learners. Stephen and Plowman (2003) found that making a computer available was useful for bilingual children because it provided a shared focus for children who did not speak the same language.

Bolstad (2004) and Yelland (2005) make the point that ICTs offer substantial opportunities to strengthen literacy because of the ease with which their multimedia functionality can be used for storytelling.

Sheridan and Pramling Samuelson (2003, p. 277) highlight the advantages as promoting creative thinking as well as literacy by "giving children a medium in which information can be presented in both a linear and a nonlinear and associative way", and so challenging children to link one thing to another. Strong arguments for the role of ICT in promoting creativity have also been made by Loveless (2002), who suggests that digital technologies are a useful adjunct for developing ideas, making connections, creating and making, collaboration and communication and evaluation.

Yelland (2005) concludes that computers can assist with developing the kind of higher order thinking and ways of working that are needed for the mathematical demands of the 21st century.

While all these authors strongly espouse the inclusion of ICT, they also lay down provisos. For example, O'Hara (2008) observed in his research that not all children are interested in digital technologies; something that most services in the ECE ICT PL programme would concur with. ICT should therefore be viewed as supplementing, not replacing, other experiences and relationships. By far the most commonly described qualification for ICT use is that children's learning through and with digital technologies is significantly affected by teachers' pedagogical awareness and the quality of their interactions. In this respect, ICT is no different from any other resource provided in an early childhood setting. As an illustration of teachers' influence, Ljung-Djärf (2008) described how teachers' beliefs about the possibilities (or threats) of computers had a marked impact on the learning experiences of the children using them. Teachers who saw the computer as a threat to other activities were more likely to view it as entertainment and less likely to interact with children by using the computer as a shared focus and learning opportunity. This study and other literature cited in Bolstad's (2004) review, point to the importance of professional learning that facilitates teachers to examine their values and beliefs about ICT as well as develop the skills and confidence to use it in their programmes with children.

Discussion of the influence of literature on the ECE ICT PL programme would not be complete without reference to the research undertaken by Roskill South Kindergarten as part of the Centres of Innovation initiative. The teaching team investigated the integration of ICTs into everyday teaching and learning practices and the impact of this on children's sense of themselves as capable and competent (Ramsey, Breen, Sturm, Lee, & Carr, 2006). A requirement of the Centre of Innovation programme was that teachers disseminated their research findings to the wider early childhood community. During the three years the team was involved in the Roskill South Kindergarten research, they notched up almost 100 presentations and publications. Their influence was noted in many of the ECE ICT PL service applications, and accounts for a large number of services initially opting to investigate the use of ICTs to engage communities.

Details of the professional learning model

The overarching goal of the ECE ICT PL programme was increased ICT capability (children's and adult's), leading to the transformation and development of a community of practice, which in turn contributes to enhanced learning outcomes for children.

The goal therefore provided three outcomes:

i. Increased ICT capability

ii. Transformation of pedagogical practice (linked to ICT) that leads to an enhanced community of practice

iii. Enhanced learning outcomes for children

The programme used a service-based approach, meaning all staff connected with the service were expected to participate in the professional learning. Each service had an assigned facilitator for the duration of the programme who provided guidance and mentorship to the teachers, sometimes as a whole group and/or with individuals.

Each facilitator worked with a cluster of 10 services. Clusters were geographically defined once services were selected. Initially there were six clusters in the following regions:

- Auckland – two clusters with one service in Whangarei and one in Thames
- Central North Island
- Wellington–Hawke's Bay
- Nelson–Canterbury
- Otago–Southland

A seventh cluster was added in 2009 when the Hawke's Bay–Wellington cluster was split in two and seven new services were picked up for a one-year programme. Findings from the one-year programme are covered in a separate milestone report to the Ministry of Education.

The design of the programme took account of the findings from the *Best Evidence Synthesis* (Mitchell & Cubey, 2003). Mitchell and Cubey (2003) found that effective professional development models were those in which participants were able to investigate pedagogy relevant to their own early childhood settings, while at the same time having exposure to practices and beliefs of 'outsiders'.

There were several components to the professional learning model. Some fulfilled the requirement for a tailored approach to content in accordance with each service's context and requirements, while others provided opportunities for professional networking across all services in the cluster. Support provided through the ECE ICT PL programme, per service, included a/an:

i. average of six whole-day facilitator visits per year

ii. maximum of eight half-day workshops per year – some of these held out of normal working hours to accommodate attendance by service teams

iii. maximum of two regional lead teacher hui per year

iv. maximum of two whole-day regional hui – these may be held on a Saturday to accommodate attendance by service teams

v. opportunity to apply for financial sponsorship to attend a relevant nominated educational conference

vi. membership of an online learning community.

Services were required to undertake a specific change initiative during the programme as a means of developing ICT capability and understanding of how ICT contributes to enhanced learning for children. This investigation was determined by the services themselves and involved using an action research approach to implementing and evaluating change. This methodology was selected for its transformative potential: the belief that deeper level shifts in practice are more likely to occur when teachers interrogate their practice using systematic processes (Campbell, McNamara, & Gilroy, 2004). In deciding on a focus for their research, teams were first encouraged to set aside ICT while they considered their vision for development in the medium term. This was to ensure that ICT did not become an end in itself but rather that there was a clear and defined purpose for using it.

The nature of the support provided through the facilitation covered action research and 21st century pedagogy as well as technical know-how. The one compulsory component of the programme, with regards to content, was that staff from each service were required to undertake cybersafety workshops. These mostly occurred in the first six months, although a few were repeated throughout the three years as services requested them for new staff.

Outputs

Participating services were required to:

- provide regular reporting against milestones (seven in total)
- contribute and share learning and ideas with the wider ECE ICT PL community and, where appropriate, the early childhood education and wider education sector.

Financial support for services

Financial support for services was provided through teacher release reimbursement funding. This was set at four days per teacher with a minimum of 15 days and maximum of 35 days per service.

Selection and profile of services involved

Selection for the programme was through application and open to all licensed early childhood services nationally. The application form (Appendix 1) was extremely comprehensive and services applying needed to show that they had robust systems in place to sustain a three-year engagement in the programme.

Services were required to have some ICT equipment in order to be considered, however the amount and nature of resources was not stipulated. The belief was that teaching teams and facilitators could work innovatively with whatever was available to them at the time. The key factors in determining acceptance into the programme were:

- a strong grounding in *Te Whāriki*
- a clear purpose for using ICT
- the potential for sustaining change.

Retention in the programme over the three years has been very high, with 60 services completing the programme. Six services withdrew either before or at the start of the programme, and a further four have withdrawn due to staffing issues and a business sale.

Where possible, new services have been taken on to replace those that have withdrawn. The breakdown of service type at the end of the programme is as follows:

Education and care services	24
Kindergartens	32
Playcentres	2
Home-based services	1
Hospital medical care services	1

As this was a pilot programme one might assume that services applying were the 'early adopters' of ICT. However, it was not the case that individual teacher capability or confidence was uniformly high from the outset. In fact, it was quite often the opposite. This descriptor was more indicative of teacher-held beliefs that new technologies do have a place in early childhood contexts and learning about them was therefore worth pursuing, although even this was not a universal given. Those starting out in this programme ranged from teachers who had never used a computer mouse – and saw no place for ICT in early childhood contexts – to those who were using digital cameras and computers confidently, mainly for documentation and assessment purposes. The potential of interactive web (Web 2.0) tools such as blogs, wikis, and other open-source applications were still largely unknown to most participants.

Intent and scope of this synthesis

This report has been prepared for the final milestone under the contract between CORE Education and the Ministry of Education. The chapters that follow represent a synthesis of the investigations, complete with evidence, from services in the three-year ECE ICT PL programme. Of the 60 services, 56 completed and submitted a final milestone report in November 2009. One service failed to submit a milestone and three were excused from doing so because they were very late additions to the programme.

An analysis of the service research questions formed a framework around *three* key areas, children's learning, engaging communities and teacher pedagogy. Within each of these, a number of themes emerged:

- Children's learning
- Engaging with communities
- Professional learning

It is important to acknowledge that in preparing and writing their final milestone, services were urged to concentrate on one cycle of research undertaken over the three years. Their reports – and in turn this synthesis – do not capture all aspects of the developments that have occurred. For example, there is ample anecdotal evidence of teachers attributing their growing confidence in leadership and presenting their work within the wider professional community to their participation in the ECE ICT PL programme. Most teaching teams introduced a number of digital resources above and beyond those they were using in their research.

KEY FINDINGS FROM THE ACTION RESEARCH REPORTS

1. CHILDREN'S LEARNING

Literacy learning outcomes in e-learning contexts

> *Language is a vital part of communication. In early childhood, one of the major cultural tasks for children is to develop competence in and understanding of language.*
>
> (Ministry of Education, 1996, p.72)

In *Te Whāriki,* literacy-learning outcomes are expressed in terms of language acquisition, competence, and use for appropriate communication. Literacy and language, while not synonymous, are inextricably related. In this respect, *Te Whāriki* reflects a now widely accepted view that 'literacy learning' and 'becoming literate' are much broader concepts than simply demonstrating an ability to decipher or scribe the written word. Literacy is more than the technical ability to 'read and write'. Rather, literacy is generally understood in curricula worldwide to be the more generic ability to read, write, speak, listen, understand, act and communicate appropriately with others in society, using a variety of 'texts' and media. Literacy is facility with language, in all its forms.

'Texts', in the language of literacies, are representations of communicated meaning. They are multimodal in that they combine one or more 'modes' of communication – the written, verbal, visual, aural, spatial and gestural. A 'text' may thus be a written sentence or a book, a picture or a movie, a dramatic performance or a verbal discussion; and 'literacy' is thus the ability to understand and use appropriately a variety of these texts in a variety of modes in order to understand and communicate ideas.

Literacy learning, at any age, is about developing the ability to understand and use a variety of language modes effectively when communicating and interacting with others.

The projects

> *We wanted our children to be not just "school ready" (being able to print their name, have working knowledge of ABC's and to hold the pencil in the correct grip as requested by a local school) but to have a lasting love of literacy.*
>
> (Teacher, Allenton Kindergarten report, p.5)

A number of enquiries in the ECE ICT PL programme focused specifically on fostering and identifying literacy-related learning outcomes for children in e-learning activities (i.e. learning activities that involved the use of one or more ICTs). For example, two of these enquiries focused on aspects of children's oral literacy, two on developing their generic language and communication skills, and one specifically on contexts that fostered children's ability to reflect on their own meaning making from various texts.

Literacy related 'puzzles of practice' investigated in the services included:

- enriching children's use of oral language through the use of ICTs
- supporting children's literacy through open access to ICTs
- fostering children's use of the Samoan and Māori language
- using ICTs as a stimulus for dialogue, revisiting, reflection and meaning making.

Literacy learning outcomes

The literacy-focused studies found that, provided the appropriate general pedagogical strategies were also in place, ICT-based activities resulted in observable literacy learning by the children. The main literacy learning outcomes identified in the studies involved the use of ICTs:

- as a stimulus for talk and conversation
- for making meaning in a variety of language modes
- as an opportunity for sharing, telling, retelling and revisiting experiences.

Stimulus to talk and conversation

Several services looked at how providing ICT-produced visual and other resources led to instances of literacy-related learning, especially oracy outcomes. Spontaneous images taken by digital cameras and digital microscopes were found to be useful stimulus to 'get children speaking' and conversing more, either with each other or with the teacher. Such talk seems to have often taken the form of explanation or providing a running commentary on their work, or by way of verbalising their personal narratives or their activity planning (as when Eddie went home and talked over his plans with parents to collect things from the garden to explore with the digital microscope the next day).

Several services noted that the addition of microphones, video recorders, data projectors and software programmes with audio recording capability, such as Photo Story3, enabled particular children to 'find their voice' amongst their peers, for the first time, as in the case of Harris ''a quiet boy who loved to play in the sandpit''.

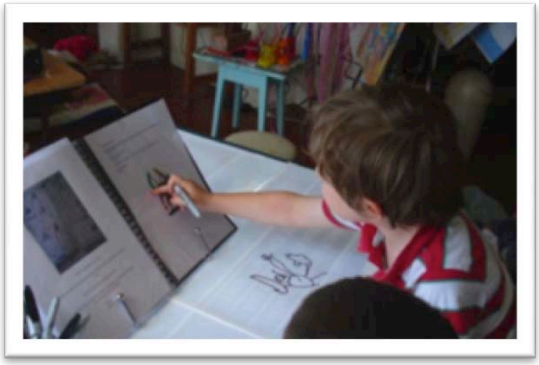
> Harris went for a trip to Christchurch and used a digital camera to take photographs. When he returned he was given the opportunity to share these with the morning group at mat time, using the data projector and the big screen. Through this experience the teachers were able to see a different side of Harris, as they had not seen him communicating in this way before, taking a lead role in the group discussion.
>
> When Harris's mother was told later she was thrilled, and pleased that it had been recorded in a video because she could not believe that her 'quiet son' would have the confidence to articulate his experiences in front of a large group.
>
> (Bayview Kindergarten report, p12 - 13)

Some services found that, for children with English as an additional language, ICT proved motivational in encouraging these children to practice and converse in English. Its value was also noted by A'oga Fa'a Samoa, where preservation and development of children's home language is central to their philosophy.

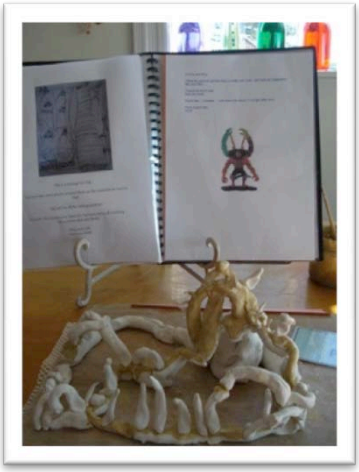
> Tiali … really likes singing and participating in-group activities. She enjoys singing and dancing together with her friends. … This also helps her a lot with her speech and especially her Samoan language. Some of the resources that have been sent home for her and her family are DVDs on Samoan songs, and also DVDS of digital stories and poems. She enjoys the song on the DVD, "Ua sau nei le malulu." … On the day we made this DVD Tiali wanted to be in front, she was standing at the back and she pushed herself through other children, trying her best to be in the front so that she can be seen and heard.
>
> When I played back the video she was laughing and pointing to herself singing and dancing in the front. After taking the video of the children singing, I started to take the photos of the children acting the different parts of the song, and guess who was the first wanting to do it, Tiali. She was the first one wanting to participate, and all the other children followed. She put on the scarf, and the hat and the other children did the rest.
>
> Her parents were so thankful for these resources, they said that Tiali enjoys singing along when watching, and these resources encourage not only her but also her family to speak Samoan. Positive feedback from the parents encourages us to make more and send resources for other children. Tiali's parents commented, "It is great to know that there are resources like these for us to see Tiali in action, singing and enjoying her self. She loves watching herself. Good to make more of these resources with children in them, to share with the parents. The resources also help encourage us to speak Samoan at home."
>
> (A'oga Fa'a Samoa report, p13)

Making meaning in a variety of language modes

Other activities and ICT resources were found to help children make meaningful connections between ideas in different modes - mostly relating visual and verbal texts like connecting ideas portrayed in pictures with (usually) spoken descriptions.



Children's Portfolios - Aiden revisits previous drawings (photographed) from his portfolio, to form the basis of his current three-dimensional clay work.
(Tots Corner report p.34)



Multimodal texts and revisiting

The multimodal nature of emerging literacy was also encouraged when children translated or presented the same stories or narratives in different forms – visual (pictures made in Kid Pix), aural (commentary recorded on digital microphones), and sequential (stories presented as slide shows), for example.

Several of the services also found that ICT-based activities often created the stimulus for children to talk meaningfully to each other as one became the 'expert' and peer tutor to others on how to use the particular piece of ICT itself.

Opportunity for sharing, telling, retelling and revisiting experiences

The other literacy-learning outcome identified in the studies that specifically investigated literacy issues, related to the affordance that ICTs provided through an editable archive for children to revisit, review and revise their work on an ongoing basis. Both Allenton Kindergarten and Tots Corner made this aspect of literacy learning a particular focus of their study cycles and both found evidence that "ICT supported 3 of the 4 children we sampled to share, revisit, tell or retell their stories" (Allenton report p.10); and that "portfolios, photographs and the [ICT-generated] wall documentation were the most valuable ICT tools for children to revisit their experiences" (Tots Corner report p.14).

At one point or another all of the services that investigated literacy learning commented on the children's tendency to revisit and often change or improve work, at home or in the service itself, because it had been archived and was in an editable form.

Eddie's interest was ignited when he observed a peer using the digital microscope. Seeing himself as a person who could rise to the challenge of learning how to use this IT tool, he began to actively explore it.

Going home that afternoon he shared his future plans with his whānau /family that he was going to collect interesting things from the garden and take them to Kindergarten the next day so he could further his exploration with the digital microscope.

Eddie asked his Grandma to support him with the garden search and together they collected treasures that they felt were going to be interesting under the microscope.

The next morning Eddie arrived at Kindergarten with his garden treasures. His passionate discussion about the digital microscope had also provoked his mother's curiosity about this technology. Eddie, his mother, a small group of interested children and a teacher sat down and closely examined what he and his Grandma had collected. As Eddie was working with the digital microscope he refined his plans and decided to document what they were seeing on the computer screen and make a book, so he could then physically share his research to all those who were interested.

After Eddie had finished using the microscope he was asked by several children if he could support them with their journey in learning how to use this ICT tool.

(Allenton Kindergarten report, p.7)

For Harley, an eighteen-month-old toddler, revisiting an earlier experience was a useful catalyst to both non-verbal and verbal language expression.

After a morning of messy play we decided to follow up the activity by watching Harley's 'Gloop photo story.' Inviting Harley's older brother Brooklyn to participate in the viewing, we watched Harley as be became totally engaged in what was mirrored in front of him. He relived the experience – indicating his understanding and interest in what he saw by pointing at himself, and looking around to gage the reaction of the children around him. He sought their approval, most importantly, watching for the reaction of his brother to see if he was enjoying the experience as much as Harley appeared to be. Brooklyn would acknowledge Harley's non-verbal communication prompts. "Its Harley" he'd say, which Dot (his teacher) supported and confirmed – "yes it's you Harley, playing with the gloop". Brooklyn became a trigger to encourage Harley to express himself in a non-verbal way. Knowing Harley well, Brooklyn read Harley's cues and responded to them, which then prompted Harley to display these attributes more.

For Harley, Photo Story 3 became a way of acknowledging an interest that was important to him. He was able to share this experience with others, gaining their interest and enthusiasm – thus enhancing his own self-esteem. The story became an outlet for the encouragement of his developing language base. He attempted different sounds.

(Rototuna Early Education Centre report, p22)

Teaching strategies that 'worked'

Sometimes this increased use of verbal language or complexity in children's speaking occurred more or less spontaneously in response to the ICT activity or the ICT generated resource. Both Kew Kindergarten and A'oga Fa'a Samoa's studies quote examples of spontaneous verbal language use at home, and Tots Corner's cite numerous examples of this observed in the service.
More often though, it was the result of additional pedagogical interventions or structures brought to the activity by the teachers or other children.

Stimulus to talk and conversation:

- *Great way to get them to talk.*
- *[She] excitedly explains what happens in the photos.*
- *….it lets me start the conversation, otherwise she wouldn't tell me much.*
- *The blog seems to revive her memory and she chats about all her activities.*

(Comments from a parent survey on blogs stimulating conversation at home, Kew Kindergarten report p.11)

In contrast to the studies above, for example, the teachers at Rachel Reynolds found that when they sent children home with a DVD of their work "children appeared to be proud to take their work home to share with their family/whānau, but we didn't always get much resulting feedback or conversation", concluding as a result that "creating shared expectations with family/whānau about discussing children's learning is an aspect of our teaching practice that we needed to improve on."
(Rachel Reynolds report, p.13)

The Rachel Reynolds Kindergarten study found that it was only when they 'persisted' in their own conversations with children, only once the children had become more confident and practiced with the technology, and only when the teachers related the use of ICT to some particular interest of the children or gave them sufficient one-to-one attention, that the amount and complexity of children's talk and discussion noticeably increased.

> *It seemed to us that our skill at teaching was of utmost importance for encouraging children to engage in conversation when using ICT …*
>
> *Teaching practices that we found effective included, using open statements and careful questioning techniques, providing one-on-one attention, creating quiet environments conducive to concentration, and building on children's interests.*
>
> *Viewing video footage has also challenged our teaching practice because we can view and analyse ourselves in action as teachers. It makes us conscious of how the teaching strategies we use such as questioning, open/closed statements, and pauses, can either promote or stifle conversations with children.*
>
> (Rachel Reynolds report, p.14)

Kew Kindergarten's study found similarly that asking open questions in conversations with children was a useful way of prompting more complex verbal responses, but that asking too many questions during these interactions, or recording spoken stories into a digital microphone before children had fully prepared their stories, tended to close such conversation down.

Learning outcomes related to thinking and enquiry

Both *Te Whāriki* (Ministry of Education, 1996) and the *New Zealand Curriculum* (Ministry of Education, 2007) refer to learning and learning outcomes as a holistic combination of knowledge, skills and attitudes. Both have elements emphasising learning outcomes related to children's thinking, their ability to effectively process information, and to develop mental models or theories about the world around them.

Te Whāriki (Ministry of Education, 1996), in particular, characterises the cognitive elements of 'knowledge' as children developing more elaborate and useful working theories about themselves and about the people, places, and things in their lives. It talks, too, of the mental processes involved in this, as children develop the necessary inquisitive patterns of thought or habits of mind that will enable them to effectively *use* information about the world to enhance their lives. In all this discussion the notion of 'knowledge' clearly goes beyond the low-level skills of comprehension or mere fact acquisition, to encompass both 'higher orders' of thinking and a mental disposition to enquire and be interested in the world.

Knowledge-focused learning outcomes are thus often characterised in two ways:

I. as a set of hierarchical 'thinking skills' (often represented as taxonomies that progress from lower to higher order as the mental process involved becomes more complex)

II. as a disposition to cognitive enquiry and general 'inquisitiveness of mind'.

Both 'thinking skill' learning outcomes and 'disposition to enquiry' outcomes were in evidence in the services' investigations of their children's e-learning activities.

The projects

Learning outcomes related to thinking and enquiry featured incidentally in many of the services' reports, but there were several that specifically focused their whole enquiry on these types of learning outcomes. There were, for example, studies of children's 'problem solving', 'higher order thinking' and 'research' skills that focused on the particular thinking skills children demonstrated in e-learning activities, as well as specific studies of children's 'habits of mind', 'wonderings' and 'explorations' that focused on aspects of children's disposition to enquire.

The main thinking and enquiry learning outcomes identified in the reports involved the use of ICTs to:

- encourage problem solving
- foster complexity in thinking
- stimulate wondering
- encourage formal enquiries and the ongoing pursuit of interests.

Problem solving

Two services that focused particularly on children's problem solving were Mosgiel Central and Jonathan Rhodes Kindergartens. At Mosgiel Central, for example, the teachers used Church's (2008) revised Bloom's Digital Taxonomy as a tool to identify the lower and higher thinking involved in children's playing of online games such as *pbskids.com, hotwheels.com, playhousedisney.co.nz,* and *nickjr.com*.

Although they ultimately concluded that the taxonomy was very difficult to apply as an analysis tool, they nevertheless found the gaming activities had indeed involved some 'deep thinking' and problem solving by the children. Specifically, they found that the gaming activities had motivated children to use and recognise letters, numbers and symbols, but more importantly, the games often had a strong mathematical problem-solving focus.

> *On the surface it can look like children are racing cars around a track, but upon close observation it was speed, levels, time, points and understanding symbols.*
>
> *They were calculating and counting to beat their time and obtain the next level. Many children set goals for themselves to get to the next level. They also talk the language of mathematics.*
>
> (Mosgiel Central Kindergarten report, p.13)

Web wall includes URL addresses of game sites – Mosgiel Central Kindergarten

At Jonathan Rhodes the teachers looked at the problem solving inherent in children's use of computer software. By videoing children and reviewing the video record later the teachers were able to capture some of what they called "invisible problem solving" by children, especially the social and non-verbal strategies they used to solve problems or when persevering with a challenge. Jonathan Rhodes teachers were then able to discuss their children's problem-solving techniques with parents.

Yes, in general Dan uses a wide range of strategies in his daily life including why and what questions, using previous experience, thinking and planning, asking for help and persistence. The video catches some of this.

(Dan's Mother, Jonathan Rhodes Kindergarten report, p.17)

Complexity of thinking

The notion of identifying higher and lower order thinking was also implicit in the number of studies that looked at the complexity of children's thinking in e-learning contexts.

In their grounded analysis of the complexity of thinking demonstrated in 60 randomly chosen learning stories on activities involving ICTs, for example, the Pukerua Bay Kindergarten teachers found evidence in over half of these stories of:

- increased ownership by children, self-documentation and self-assessment
- increased attention to detail in observing and talking about their artwork and flora and fauna
- engagement in enquiry for longer periods of time
- more complex articulation of their understandings through reflective and informative narrative.
- increased cognitive risk taking and flexible thinking (Pukerua Bay Kindergarten report p.21-30).

Riversdale Kindergarten, by contrast, analysed their learning stories in a less grounded way and used more traditional 'levels of thinking' framework to analyse complexity in children's storytelling based on:

- making connections between the concrete and the abstract
- vocabulary extension
- children revisiting their learning
- thinking progresses from gathering to processing to applying information
- and children thinking about their thinking by reflecting on their work.

Learning story – Paige's paddock

On this particular day I noticed her building quite an elaborate construction using the duplo and animals. I sat down with her and started talking with her. She explained to me about the work she was doing with the duplo. Her explanations were very detailed so I asked her to hold her thoughts for a moment while I got my pen, paper and the camera. I remember the smile she gave me as she sat and waited for me to return. When I returned I quickly wrote down her words and took photos myself. I took the photo's myself so I didn't interrupt the flow of her story.

As she was telling me her story I told her that I had horses too. She smiled but did not enquire about them. She was very absorbed in what she was doing and telling me about what her horses needed. At the end of the session I put the photos on power point and made the book using her words.

When Paige came to kindergarten I read the story back to Paige. This was her response:

"I've made a paddock for my horses. They have water and grass to eat. They need a gate to keep them in. It pens and shuts. There are some safe jumps for the horse.

I've got a dog.

That's me with a dog and my friend Tessa.

She is coming to look at the horses.

I have put water in the trough.

I have a friend Amanda, and she has horses at her house. She has a gate so they can't get out.

She has a house for the horses but it doesn't have a door.

I've got a goat at the paddock. He pushes me when he is hungry."

After sharing the story I gave her the book to take home and put a copy on the bookshelf for the children to share. During the weekend Paige made me two amazing pictures and made herself a book that she shared with me. In the book she had written her own words so she could read me the story herself. She asked me to come and sit with her so she could read it to me. She had drawn some lovely pictures and written letters. The letters represented words. As she read to me she pointed to each letter as if it was a word.

"Once there was a tallest flower. It should be big cause it has lots of water.

There is a spider on the web but he is making it big. The web is finished.

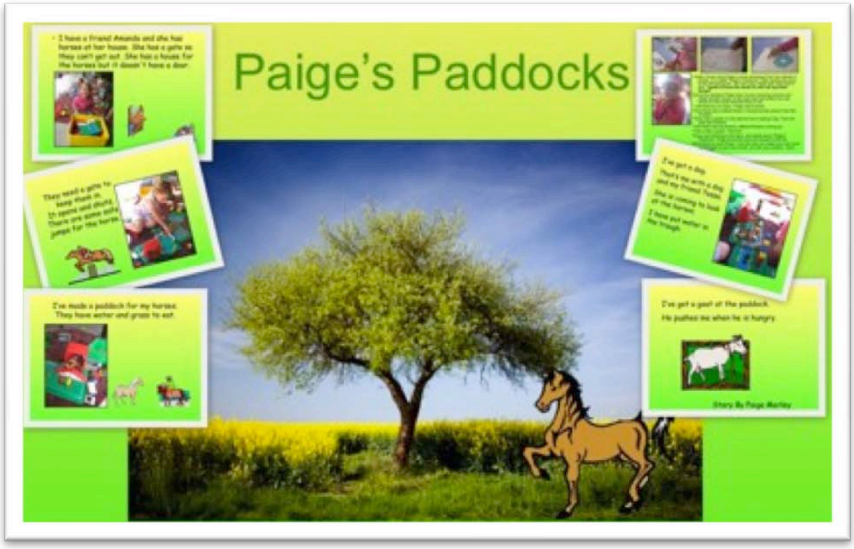
Then there was big flowers, but different flowers coming up.

Then a fairy comed.

The End."

I told her that I was very impressed with her storytelling skills. The look of pride on her face was priceless. Paige shared the story with a relieving teacher. I was impressed to hear her telling the same story and pointing to the letters as she spoke. … She displayed a real understanding that letters represent words. Paige went on to make and write several stories for her family. …This gave her the opportunity to share her ideas and thoughts with other people.

Teacher's analysis – Page's paddocks



The e-book gave us an insight into Paige and what she was interested in. We initially thought this would be an interest in horses. Instead Paige's interest was in literacy and her skills in being an author. Paige found something that she could do and that was responded to positively by adults and children.

Paige's confidence and self-esteem was unlocked through the e-book. It was also because a teacher had understood and applied notice, recognising and responding as part of assessment in a timely way. If the making of the book had been left for more than a day or the stories and pictures put into a learning story in her profile, I doubt it would have had the same effect.

Abstracting – connections between abstract & concrete

Paige illustrated this indicator when she understood that she could be an author and made her own book at home. While she didn't use ICT to create the book, we know that when Mum was shown how to, she showed Paige, then she was able to do this at home.

Children develop and acquire vocabulary

Paige's vocabulary was enhanced as she expressed her own words to create her stories. She used a variety of tenses and descriptive words that she may not have used in her everyday speech. The books gave her the opportunity to experiment with language. Paige also displayed an understanding of the elements of a good story. All her stories had a beginning, middle, and an end.

Revisiting

With the support from her family, Paige was able to revisit her learning many times at home.

The family listened to and appreciated her stories and she was encouraged to make stories for her Dad to read to him when they spent time together.

Thinking goes from gathering to processing to applying

Making books at home for friends and family showed that Paige was able to take the knowledge she had learned at kindergarten and apply it at home.

Children thinking about thinking

Paige understood that the letters she had written represented the words of her story. Every time the story was read she pointed to the same letter and said the same word. …

She was able to think about the reader and write a story for them.

"I really like making stories. I made a book for Dad and I read the special words. I wrote a special letter for Sohum and I am the only one who can read my words."

(Riversdale Kindergarten report, p. 7-8)

Through this framework they identified not just cognitive but also metacognitive outcomes. Metacognitive outcomes were often taken as any form of reflective comment made by children about their own work, but especially those comments that addressed the process rather than just the product of their learning. Similar outcomes were identified by several other services, most notably in Geraldine Kindergarten's study of their children's 'Habits of Mind'.

Stimulating wondering

Children also wonder about things they have no way of seeing 'in person' and this is an area of strength for the ICT tools, the resources of 'YouTube' and Internet sites are rich in opportunities for modelling and teaching not only wondering behaviours, but some effective ways to research.

(Pukerua Bay Kindergarten report, p.16)

Several reports provide evidence that ICTs can be used in a variety of ways to contribute to children's 'wonderings', and to their implicit theory-making. Examples are cited of ICTs:

- 'kindling' wonder (eg making a movie of a Māori legend generating an interest in other Māori legends – Otatara Kindergarten)
- being an enabler to enquiry (eg using digital microscopes to see things previously unseen – Campus Crèche Preschool)
- being a medium through which they can express and make visible those wonderings (eg the "accurate" artwork in children's presentations on flora and fauna – Pukerua Bay Kindergarten).

Encourage formal enquiries and the ongoing pursuit of interests

Yes, 'hands-on' is great, but YouTube video files can be the next best thing if live chaffinches or rattlesnakes, live sharks or crocodiles aren't just handy when curiosity or teachable moments are evident.

(Pukerua Bay Kindergarten report, p.16)

Associated with the notion of wondering is the outcome of children pursuing those wonderings and making them the stimulus for ongoing enquiries, often on their own initiative. The reports from Yendarra Kindergarten, Peachgrove Kindergarten, and Campus Crèche Toddlers, for example, all relate instances of children using digital microscopes as a way to transform wonder and interest into more "meaningful engaged work across the curriculum" (Pukerua Bay Kindergarten report, p.10).

Yendarra Kindergarten, for example, cite the following instance of Arapeta, who found an insect of interest to him in his garden and turned this into a full-scale formal enquiry:

In response to Arapeta's insect find in the garden, the teacher supported by the digital microscope, and insect and wildlife book, encouraged him to match what he saw under the microscope with what he could find in the book. After moving between interest in what he saw magnified and the variety of pictures in the book he identified the insect correctly and named it. Over several days of investigating, collecting, practising the techniques needed to focus the microscope correctly, and discussing insects' habitats and eating habits, Arapeta began to widen his inquiry to plants and other items. His unprompted descriptions of these magnified images drew comparisons with other knowledge he had. Describing a magnified leaf as, "It's like a turtle back", and physically demonstrating what he was saying.

(Learning Story. Yendarra Kindergarten report, p.18)

Teaching strategies that 'worked'

The visual nature of ICT magnifies, highlights and clarifies events for children that can only be seen gradually, or not by the naked eye. For example, Zachary seeing the caterpillar hatch out of the egg on the video clip.

(Pukerua Bay Kindergarten report, p.11)

The pedagogical strategies that the services found worked in fostering thinking and enquiry-learning outcomes, included:

- engaging with children using invitational rather than closed questioning techniques
- consciously asking children about their thinking processes

- creating a special language for discussing thinking and enquiry with children ("I'm a perseverer. Sarah's not, she's a risk taker!" – Geraldine Kindergarten report.)
- videoing children solving problems and analysing the video later, as much of their thinking and enquiry habits are invisible in the moment
- having the ICT visible and accessible in a designated space
- giving children control over how much/how little ICT they choose to use
- children having ready access to digital cameras and printers with which they document their own learning
- children and teachers working collaboratively and not leaving the computer or ICT to be a 'babysitter'
- established frameworks for identifying thinking levels can be variable in how easy or difficult they are to apply.

Learning outcomes related to children's agency as learners

The concept of 'agency' in the education literature usually refers to the extent of autonomy, control, independence or authority that an individual has, or exercises, in a social setting. It thus refers to the extent to which individuals in educational contexts are seen, or see themselves, as 'in charge of their own destiny' as learners and/or teachers.

When *Te Whāriki* talks, therefore, of children being or becoming "confident and competent learners" and of their being "empowered" as learners, or when the *NZ Curriculum* talks of "managing self", "contributing and participating", or when educationalists generally talk of "child-centred learning" and of teachers being "the guide on the side not the sage on the stage", they are essentially discussing issues of the power relationships that exist between learners and teachers in services and schools. They are discussing where the locus of 'agency' might lie in any educational activity or context.

It is also a common claim in the literature on e-learning and new technologies in education that a major affordance of such technologies is to provide rich opportunity for learners to follow their own interests, to learn relatively independently, and to control and manipulate information in ways not previously practicable.

It is hardly surprising then that a common and prominent theme in the services' reports was to investigate and identify learning outcomes related to their growing sense of themselves as learners, the relative dependence or independence that they exercised in their learning, and the extent to which they were willing and able to self-assess and self-improve in activities involving the use of ICTs.

The projects

Outcomes for children related to their sense of agency and empowerment as learners featured incidentally in many of the services' reports. However, studies that particularly focused on such outcomes included investigations of how ICTs might be used to encourage children to 'drive their own learning' or follow their own interests (Rangitoto Kindergarten, Campus Creche Preschool, Eastbourne Barnados Early Learning Centre), to self-assess and set goals (Bayfield Kindergarten, Onehunga-Cuthbert Kindergarten, Lucknow Kindergarten, Greenhithe Kindergarten), and to be critically reflective (Halfway Bush Kindergarten).

Three prominent themes related to children's agency emerging from the reports were:

- Empowering children as learners
- Becoming an 'expert'
- Self-assessment and self-critique

Empowering children as learners

I typed out my story all by myself. Aren't I clever!

(Greenhithe Kindergarten report, p.1)

A number of the studies identified learning outcomes related to the children being empowered as learners through their ICT activities. Some of these reported this as:

- an awareness of themselves as learners, indicated by instances of children showing a sense of accomplishment and pride in their work
- being able to document their learning in their own language
- expressing a desire to use the ICTs again and again or to revisit ICT-generated products.

Other services reported this self-awareness as a learner more in terms of the children showing independence and autonomy in their ICT related work, indicated by instances of children spontaneously choosing to use ICTs in their play and becoming more knowledgeable about software than their teachers.

Becoming an 'expert'

Many of the reports commented on children building a sense of their own ability from the activities that went beyond pride in their work to involve them in becoming the 'expert' who shared their knowledge or expertise with others in the service, became more socially aware as a result, or simply 'came out of their shells' more in a social sense.

Tony's first interest involved his bringing into Kindergarten a cicada he had found. From this small beginning, Tony progressed to being a leader amongst his peers in the use of the digital microscope, and a teacher of Comic Life not only his peers, but also adults and student teachers.

Greenhithe Kindergarten report, p.11)

Often this 'becoming the expert' involved them becoming the service's acknowledged technical expert with respect to a particular ICT or piece of software – as in Lucknow Kindergarten's learning story of Gerard the digital microscope expert, or Campus Creche Preschool's Press 'photographers of the day'. But there was also evidence of children becoming the acknowledged service expert in content fields as well – as in Rangitoto Kindergarten's stories of 'Lucas the Bird Watcher', 'Cameron the Palaeontologist', and 'Leo the Bug Man'.

> We learnt together, children, teachers, family and the wider kindergarten community. Leo's enthusiasm and curiosity was infectious. He led a complex and fascinating investigation. ICT did not just answer Leo's questions and sustain his inquiry, but provided him with the opportunity to drive his own learning, collaborate with his peers and teachers, take on a strong leadership role and the motivation to try out new activities.
>
> From Leo's interest, many other children experienced, discovered and explored the natural world around them, ICT played a large role in this very exciting project and the indicators of: child driven, sustained inquiry, self efficacy, shared meaning making with other children, and shared meaning making with family/whānau were all evident. ICT was indeed a tool that 'empowered children to drive their own learning.
>
> (Rangitoto Kindergarten report, p14)

Self-assessment and self-critique

Several reports provide evidence of ICTs being used in a variety of ways to encourage self-assessment and reflection. Greenhithe Kindergarten, for example, analysed their learning stories for evidence of children engaging in self-assessment in the forms of "making their own judgments about their achievements", of "knowing what they are good at", and of "seeing mistakes as part of the learning process". Onehunga-Cuthbert, Lucknow and Greenhithe Kindergartens all paid particular attention to children's goal setting in ICT-based activities.

Although the services talked of children's self-assessment in terms of *both* self-affirmation *and* self-critique in their commentary, instances of children being self-*critical* were much less in evidence than instances of their being self-proud. This may partly reflect the teachers' frequent concern not to pathologise their children's learning when representing it in learning stories, and it may be that the children were legitimately positive about themselves. But it may also reflect the inherently 'hidden' or 'unobservable' nature of reflection, and especially *critical* reflection, as a phenomenon to be identified. Simply citing instances of children 'revisiting' ICT generated work or 'retelling' their stories, for example, would not itself provide convincing evidence of children being *critically* reflective, whereas instances of their subsequent editing, changing or making improvements to that work or those stories, might.

An example of these issues at play, and some of the teachers' techniques for fostering more critical forms of reflection, can be seen in the incidents cited below, from Halfway Bush' Kindergarten's study:

> The teacher support became more precise as the children became more aware of their own photography successes and began to critically reflect. An example of this was when Brayden took a photo where the child's head was missing. He showed the photo to the teacher. She verbally prompted him "We can't see Emily's head!" This allowed Brayden to become aware of getting all of Emily into the photo. "I can take another one!" Brayden responded.
>
> Another example of this was when Emily photographed her name. She looked at the photo and reflected that not all the letters of her name had been captured in the photo. The teacher verbally prompted Emily by asking her "What's happening here?" This reminded Emily from previous experience when she had discovered that by standing back to take the shot; she could get the whole of her name in. "I need to stand back to get it all in" was Emily's reply as she tried again, this time positioning herself so that she could achieve what she wanted.
>
> As the children began to become critically reflective and chose specific images to capture, the verbal prompting from teachers changed for these children who had advanced to this stage in their journey of digital photography. Teachers were now encouraging children to reflect on their photography by asking questions about why or why not the child liked a certain photo. For example, a photo that was too bright to see properly. The teacher discussed with the child why this might be. It was recognised that the sun shining in the window caused this to happen and the photo needed to be taken in another direction. This type of verbal prompting allowed the child time for reflection. Children were still supported to try again and have another go.
>
> (Halfway Bush Kindergarten report, p.19)

Teaching strategies that 'worked'

> *Through [our] providing Sapphire with the means and the 'space' (not interrupting her, just standing back and offering assistance if and when required), Sapphire began to really explore the digital camera and became extremely creative with her photography.*
>
> (Greenhithe Kindergarten report, p.7)

Most of the recommendations made about this aspect of their teaching concerned providing children with the time, space, and trust they needed to learn about and use the technologies for themselves. The specific pedagogical strategies recommended to foster children's agency in learning included:

- giving the children the technology to use themselves – trusting them with it
- giving children enough time and space to self-assess
- moving away from 'leading' the children to become followers and co-learners alongside the children – being the silent observer and listener

- role-modelling the use of the technology
- judicious use of open-ended but targeted verbal prompting
- thinking about what is meant by *critical* in 'critical literacy', 'critical reflection', and 'critical thinking'.

Learning outcomes related to culture and cultural values

[All children are to be] given the opportunity to develop knowledge and an understanding of the cultural heritages of both partners to Te Tiriti o Waitangi

(Ministry of Education, 1996, p.9)

A number of services focused their enquiries on learning outcomes related to issues of cultural knowledge and cultural values, especially Māori and Pasifika cultures. These enquiries were about using ICTs to enhance te reo Māori or language knowledge, but in part they were about using ICT-based activities to raise cultural awareness, and for some, even more importantly, about using ICTs to encourage cultural values and children's sense of their own cultural 'ways of being'.

The goal of enabling Māori individual and collective cultural identity, where Māori children have access to a world (historically, contemporarily and futuristically), which is Māori, necessitates a regeneration of te reo Māori. It is not enough to simply learn about Māori – a bit of poi and haka here and there and to know that 'ma' is white – but to live as Māori, creating meaning out of life as Māori.

(Skerrett, 2007. P.8)

The projects

The culture-focused studies included investigations of children using digital recorders and cameras in conjunction with live performances to practice and capture their pepeha, make movies of Māori legends and hold a gala movie evening for parents and whānau, and use digital stories in te reo Māori as learning resources.

All found that, provided the appropriate general pedagogical strategies were also in place, ICT-based activities resulted in observable cultural learning by the children. Key themes emerging from the studies related to cultural learning outcomes and included the use of ICTs to foster children's:

- language acquisition and use, specifically of te reo Māori and Samoan
- awareness of specific cultural protocols and customary practices
- cultural values, for example, as embodied in tino rangatiratanga and whakawhānaungatanga
- cross-cultural learning – learning *about* other cultures.

Cultural learning outcomes

Language acquisition and use

Several services looked at how providing ICT-produced visual and other resources fostered language acquisition in te reo Māori. The teachers at Te Rau Oriwa Early Learning Centre, for example, mapped both the vocabulary and complexity of expression of several of their children as they used Kid Pix and digital cameras as part of writing and recording their pepeha.

They found that the reo the children used was a mixture of simple vocabulary in a mix of English and te reo Māori ("click the putiputi", "my maunga is pongo", "I'm drawing you whaea to hoe my waka"– p 35) and complex sentences all in Māori ("Titiro whaea , kei te mahi porowhita i runga te rorohiko." Kei te karakara ahau te porowhita – p 43), with an emphasis on the former.

They also found a mixture of vocabulary about the computer software itself (colours, how to do things on screen etc) and vocabulary related to the pepeha (what or who should be in a pepeha, its sequence etc). The combination of textual, spoken and visual cues afforded by the Kid Pix software were seen as the key technology-based factors in prompting this language use.

A learning story: Zedakiah's pepeha

Zedakiah wanted to do his pepeha. Whaea set up Kid Pix for him. He started off doing his maunga, he chose the tools he wanted to draw his maunga with. He chose kahurangi to draw his maunga, while he was drawing his maunga he was saying "Ko maungatautari toku maunga." "Whaea my rakau needs to go on to my maunga." He chose the stamp tool and chose the rakau he wanted to use. Then he asked whaea. "Kei whea a Tama-nui-te-ra?"

Whaea and Zedakiah looked through the stamps to look for Tama-nui-te-ra. Then he saw the marama, and put the marama in his pepeha.

He sang the waiata 'aue to ra' while he was drawing. Whaea showed him how to save his picture. Then he asked to do his awa. He chose the tool and different textures, for his awa; he said his awa while he was drawing.

"Whaea my awa's got a tuna in it." so he used the stamp tool for his tuna. For his waka he chose the spray paint tool and parauri for his waka. Whaea asked, "What are you drawing?" Zedakiah said, "I'm drawing you whaea to hoe my waka." Then he drew his whānau his mum, dad and him, he chose purple for mum with spikey hair, blue for dad and red for himself. Whaea supported his drawing by using te reo for his picture for the basic body parts."

(Te Rau Oriwa Early Learning Centre report, p.28)

Awareness of specific cultural protocols and customary practices

The most common example of incorporating ICT activities to reinforce awareness of and participation in cultural practices and customs was in relation to children's pepeha. Both Te Rau Oriwa Early Learning Centre and Yendarra Kindergarten made a particular study of how ICTs could be used by teachers and children to develop or perform their pepeha. Yendarra reported as one of its key findings that the focus on this as the context within which Kid Pix and other technologies were used had helped children, among other things, to "make links within a whakapapa whānau", to develop an "awareness of and taking part in protocol and customs for particular occasions", and to take "responsibility for carrying out inclusive routines." (Yendarra Kindergarten report, p.22)

Other activities and ICT resources were found to help children make meaningful connections between cultures and to revisit cultural concepts and stories over time. At Otatara Kindergarten, for example, the focus was on learning Māori legends through making their own films of such legends. "For some time after the movie night" their teacher recorded, "children wanted to recreate the whole Mataukauri story whenever they were outside (as the movie was set within the natural features of the kindergarten playground)" (Otatara Kindergarten report, p.17).

At Otatara Kindergarten, YouTube was also utilised to search for other Māori myths and legends for children to watch and reinforce this awareness and connection making.

Cultural values

Most of the evidence provided in the studies related to the learning of language and cultural customs, but there is some evidence of ICT-based activities encouraging children to live their cultural values both within and outside the service. For example, in a learning story on one child's ongoing use of the digital microscope in his enquiry into insects from his garden, his teacher commented: "Some of the old people say that the tohunga used to think like the creatures around them, the birds, the animals and maybe even the worms! That's the way they got to know what all the creatures around them needed" (Yendarra Kindergarten report, p.19).

Yendarra Kindergarten also gathered evidence from whānau on whether or not the children were incorporating what they were experiencing through their pepeha and karakia activities at kindergarten in their home environment. Even though only two of the children came from homes where these may have been practiced, they found that all of the seven children studied spontaneously sang waiata from the service at home, and about half used karakia from the service for food, said their pepeha in Māori, used basic Māori greetings, and incorporated Māori words learned at the service in their home conversations.

It was commonly reported that services incorporated cultural 'values' in their use of ICTs through:

- integrating the use of te reo Māori in conversations with children whenever they were using ICTs
- drawing children's attention to those values in their conversations when they were using ICTs
- choosing Māori content and themes for ICT activities

- building Māori customs (mihimihi, karakia, pepeha etc) into the daily routines of the service. The role of ICTs in this regard was mostly to provide the opportunity or stimulus for such discussions and demonstrations rather than being inherently 'value-friendly' activities in themselves.

Cross-cultural learning – learning about other cultures

Both Yendarra Kindergarten and Otatara Kindergarten commented in their reports that their focus on Māori language and cultural activities in the service was in fact an example of cross-cultural learning, as most of their children were from non-Māori backgrounds. At Yendarra Kindergarten the majority of children were Pasifika and at Otatara Kindergarten the majority were Pākeha. The cultural learning involved in their children's use of ICTs, then, was learning about *their own* culture for some, and about *another* culture for most.

Teaching strategies that 'worked'

Sometimes the increased use of te reo Māori occurred more or less spontaneously in response to the ICT activity or the ICT-generated resource. Both Yendarra Kindergarten and A'oga Fa'a Samoa's studies cite examples of spontaneous use of Māori language and custom being 'taken home' from the service, and Otatara Kindergarten's and Te Rau Oriwa Early Learning Centre's both cite examples of this observed in the services.

For the most part, though, such learning was the result of a combination of direct teaching and the affordance of the medium. The teachers at Te Rau Oriwa Early Learning Centre, for example, found that it was only when *they themselves* concentrated on using te reo Māori to converse with the children as they wrote their pepeha on Kid Pix, and when they used open-ended rather than closed questions, that the children's use also increased.

This included the kaiako having to familiarise themselves with the Māori words for the technology jargon, and the appropriate words for the particular piece of software being used (terms like 'click', 'save', 'drawing tool' etc).

Recorded reflection of a teacher at Te Rau Oriwa Early Learning Centre

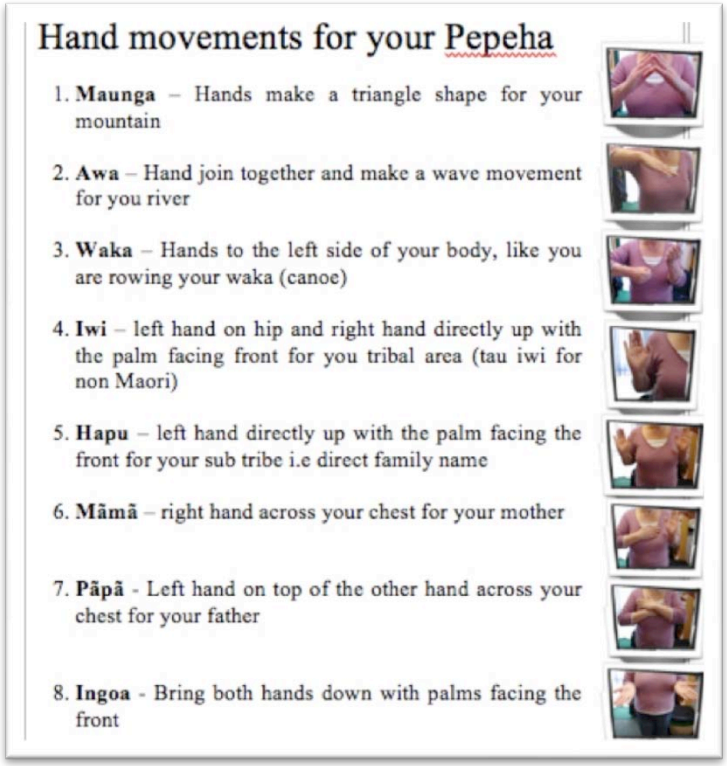
This afternoon I took the opportunity to work with a child that was using Kid Pix. The child was already exploring tools and icons with the programme. I sat down and was speaking to the child in English, then one of the kaiako (teachers) said 'korero Māori'. I replied by saying 'ae'. Then from that moment on I was dumbfounded and numb, because I realised that I didn't know how to korero Māori in the context of Kid Pix. I said ka pai, he aha tenei, but I was just asking closed questions that were not getting the child or myself anyway in ways of opening up a conversation of communication.

This experience disturbed me. I need to be playing the part of using te reo Māori with interactions with tamariki. I can implement te reo Māori within the other areas of the daily programme, but I felt this was a challenge that I needed to overcome. I then asked a[nother] kaiako for help ... I asked her to look at the Kid Pix instructions that are translated in te reo Māori, and then korero and interact with a child that is at the computer working on Kid Pix.

(Te Rau Oriwa Early Learning Centre report, p.15)

The Te Rau Oriwa Early Learning Centre also found that using the digital camera to make images of themselves performing the actions appropriate to things like parts of the pepeha and incorporating these into 'how-to' sheets for the children, assisted in independent practice and performance of their pepeha.

Otatara Kindergarten teachers similarly found that their children's moviemaking activity, while it clearly enhanced some children's te reo capability and "made them familiar with a number of different Māori myths and legends" (p.16), was not without its logistical difficulties from the teacher's point of view.



> The major outcome staff wished to achieve was to see an increase in children engaging in te reo and contributing in a real and meaningful way. …
>
> Like any good movie, a lot of takes were shot and a lot of footage landed on the cutting room floor before the final result was achieved. Having to go over and over the story and re-shoot scenes endless times didn't seem to worry the child actors. Being involved in the whole drama was what they wanted.
>
> Trying to capture raw children's dialogue was a challenge though, and eventually had to be abandoned. To ensure that the movie did have an element of te reo, I borrowed a table microphone from Otatara Kindergarten School. Then I got the children with the speaking parts into the office and voiced over the raw audio. Again, through the magic of iMovie, as many attempts as was necessary could be made until the whole thing sounded right. At the same time, I got that group of children involved in selecting the special effects (which were sourced from Google Images or You Tube) and in producing a screaming girl special effect.
>
> (Otatara Kindergarten report, p.29)

They concluded, like others, that their moviemaking activity provided one high impact focus on te reo Māori, but was likely to have its long-term effect only in combination with other reinforcements and as part of a package of learning activities that complemented ICT activities with other non-ICT based activities.

It is debatable whether there was any immediate, measurable increase in mana reo, but this is something which is being supported by other ongoing activities (daily music and movement and staff interactions)… If anything it has been the increase in the visibility of te reo amongst the school community that has been most notable.

(Otatara Kindergarten report, p.29)

Using ICT to encourage children's creativity

Creativity is not easily defined. However in general terms it involves a capacity to take what we have and transform it into something of value that is new or original. Most agree that creativity is associated with imagination and inventiveness; attributes, which as humans we are born with but that either flourish or wither depending on the environmental conditions experienced by individuals. Environments that encourage playfulness, risk taking, openness to multiple perspectives and collaboration are more likely to draw out creativity in children than those which are underpinned by conformity and control.

In today's world, digital technologies and new media are frequently associated with creative people and creative activities. Therefore we could expect that these tools would make a strong contribution both to learning how to be creative and highlighting learning through being creative in early childhood education contexts.

In reviewing the potential of ICT to support creative endeavour, Loveless (2002) highlights a number of features, which can be exploited to support creative processes. 'Provisionality' is one of these. This describes the way in which ICT allows users to make changes, try alternatives and keep track of evolving ideas. Other features include 'speed' and 'automatic functions', which Loveless suggests enable tasks such as "storing, transforming and displaying information" to be done by technology so that users can revisit, interpret and reconstruct activities. By defining first the features and then how these can be applied, Loveless again reminds us that ICT alone does not give rise to creativity, it is what people do with it that does.

The projects

Just two of the services made enhancing creativity the specific focus of their investigation, although many more used ICT in ways which either enabled children to create original work or documented examples of children's creativity as a valued aspect of learning. The two services looked at how complexity and confidence in the creative arts could be enhanced by using ICT.

Using the Internet as a source of provocation for developing ideas

Concerns are sometimes expressed that it is too easy to go to the Internet to find answers and this discourages children from problem solving and thinking independently. While this might have merit in some situations, there were examples from several services that demonstrated the opposite was true. Using the Internet thoughtfully provided children with alternatives and new ideas to consider. In short, it facilitated their creative endeavour by adding complexity to their own work.

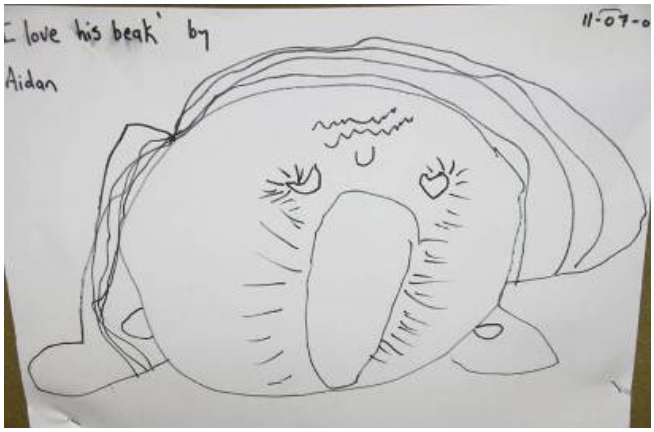
Often images on the Internet inspired children's artwork, as the following example demonstrates:

For us, being creative was not just about children accessing information, it was what they then did with it.

ICT seems to engage children more than traditional resources used for research. Previously adults were having to mediate the resources (eg teachers choosing books and videos). The value of ICT is that it is more immediate, more visual and children are able to access it independently.

ICT also provides access to a world of current information that would be impossible to provide in a centre environment. For example, for Aiden and Jorja the Internet provided images when drawing that they based their artwork on. They were able to navigate the sites independently, choosing the images they wanted to draw. They made decisions about what to do with the information they had learnt about masks. They went onto the site over and over again examining the masks in great detail and noticing new details each time, and adding these details to their drawings. Their confidence was increased as they were in charge of their own learning and the realism and visual nature of the images seemed to inspire them to draw.

A mask from the Indira Ghandi Centre for Performing Arts website: www.ignca.nic.in



Aidan's drawing of the same mask.

(Otago University Fulltime Childcare Centre report, p.10)

While services continue to use books as a source of inspiration, it seemed that the Internet often provided a more comprehensive and versatile resource for non-fiction information than the service could ever hope to have in a book collection.

ICT supporting playfulness and experimentation

Recently we have heard teachers discussing whether ICT kills creativity. Perhaps it is the teaching philosophy, teaching practices and the teacher's values that have the real effect on how ICT and creativity are viewed and used.

Using closed 'click and push' software is going to kill creativity, because it is about the software and its sounds and 'bobs and whistles' effects, not the children's imagination. We use open-ended ICT tools e.g. digital camera and software such as Kid Pix.

(Otago University Fulltime Childcare report, p. 16)

During the course of the ECE ICT PL programme, several services introduced software programmes with open-ended qualities such as Comic Life, PhotoStory3, Kid Pix and Photo Booth. These programmes enabled children to explore combinations of media; for example, putting audio together with photos and playing with image manipulation.

Digital photography also afforded opportunities for experimentation. Lucknow Kindergarten found that the increased use of digital technology within the service led to children's confidence to experiment in order to gain the results they wanted, as is illustrated in the story of Gerard's use of the camera. Furthermore, teachers observed that as the more experienced and skilled children modelled experimentation, the newcomers quickly learnt to use the tools in a similar way.

A dead monarch butterfly was capturing Gerard's attention. He experimented with enlargements by changing the wheel on the camera. Close up photographs inspired his question "Do Monarch butterflies bleed?" Gerard used another function to return to a previous photo to show me. Within minutes the photos were downloading onto the computer screen. "How did you get these (photos) onto your computer?" The next day Gerard photographed the worms. He practiced his close up photography. He demonstrated to Ruby how to get a close up. In addition he discovered how to get multiple views on the screen – that was a surprise! And Gerard had added complexity to his learning.

(Lucknow Kindergarten report, p.12)

Using ICT to highlight and give value to children's creativity

There were many examples of using ICT – particularly data projectors and LCD screens – so that children could share the 'products' of their creative work, digital stories, photographs, animations, and get feedback. The use of ICTs to highlight creative work often had the effect of 'spreading the word' about what was possible and led to other children's motivation to create and present work.

> Kassidy and Sophie's video exemplars have captured the value of using video to promote storytelling and giving children the opportunity to assess and revisit their learning experience. The activity proved so popular it prompted several other children to have a go! Videos where sent home and celebrated with extended family. Interesting to note that many boys were involved in this activity.
>
> (Sunshine Kindergarten report, p.17)

At Nayland Kindergarten the initial focus of their investigation was what teachers could do to increase the level of challenge and creativity offered to children in the visual arts. Having adjusted their role from a largely hands-off approach to one where they saw themselves as co-constructors alongside children, they used photographs and videos to capture both the new adult role and children's creative processes in action. The teachers observed that for "the boys especially, the use of ICT seemed to be a provocation" to engage in art (Nayland Kindergarten report, p.21).

The sandpit was an ideal place to explore ephemeral art. As it is not meant to be permanent the children had the prior knowledge that at the end of session all materials were to be packed away.

Children were able to keep their artwork by taking photos of it and then revisiting the materials to create further works.

(Nayland Kindergarten report, p17)

As part of children learning what it means to be an artist, the teachers organised an art exhibition for families and others in the community. ICT played an important role in the marketing, documentation and celebration of the children's work, reflecting back to them the value placed on their creativity.

There was an expectation from the boys that their photos on their paintings were there to tell other people that they were the artists.

They had also developed an understanding that artists exhibit their work for others to enjoy and to received feedback. They also learnt about the process of exhibiting work.

(Nayland Kindergarten report, p. 20)

ICT to support creating and meaning making

There were numerous examples throughout the services of children creating digital stories, usually based on personal interests and experience. These varied from narrated photographs made into a photo story to dramatised movies, which were directed, filmed and acted by the children. In some cases the learning afforded by the experience was as much about gaining skills in new media with which to become creative. This is illustrated in this example about children learning to use animation:

We discovered that making animated movies is a wonderful way to tell stories and bring our ideas alive. Two people generally have to work together to make the process work. One moves the characters and one takes the pictures on the computer. We discovered that the children who have watched the process from the sidelines generally step up and have a go at making their own animated moves.

These children have developed an understanding of the concept of animation. They realise that the characters in the story must only move a small distance, a picture is taken, and then the characters move a small distance again. For a movie that takes a few seconds to run, hundreds of frames are taken.

The process works extremely well if the essence of a story has already been formulated, but I am amazed at how the story grows and becomes more detailed once the animation process is underway. Props are added and the children become more particular about the nature of these props and where they will be placed.

Some children have been introduced to the animation process by being the watchers in the early days when we were learning to make animated movies. Slowly they have become active participants in making the stories. With experience and practice the children take over the whole process and make the movies on their own.

(Takapuna Kindergarten report, p.23)

As Loveless (2000) explains, the fashioning of creative work "involves not only the physical act of making, but also an ongoing dialogue where the maker produces and the work responds". There were examples where work previously documented was then revisited and refashioned using different technology, and of children editing and revising their work as it was being created. An example of the latter is James, who was able to use Kid Pix and Comic Life to pursue his interest in manipulating letters and fonts. His teachers, observing his progress wrote:

> Not only was this an indication of James' developing curiosity about language and writing, but it demonstrated a confidence in himself as a resourceful learner who was willing to analyse his own work and take responsibility for moving it a step further. After this, James could often be found tutoring others on this technique. …
>
> When shown the editing tools he was soon adjusting transitions and sound effects quite independently… He would often reflect on his commentary and ask to go back and change it. Again this was an opportunity for him to have autonomy over his project, extend it.
>
> (Onehunga Cuthbert Kindergarten report, p.16)

Conclusion

In terms of children learning to work creatively, there was substantial evidence from the services of children designing and making original works involving ICT. This was made possible because teachers trusted children to use the equipment themselves. A common occurrence was children transforming everyday experiences into stories and sometimes dramas using ICT as a means of recording. There were many examples of children sharing their 'good' work with others and consequently experiencing that sense of value for themselves and their peers. ICTs certainly appeared to facilitate this sharing, often motivating further creative activity.

Given the association of new technologies with creative acts, it is perhaps surprising that more services did not choose to investigate this aspect more specifically. In fact, very few services made reference to creativity at any point in their reports. Instead they tended to talk of children becoming 'competent and confident' as an outcome of working with ICT, echoing the aspiration statement of *Te Whāriki*. Is this because the actual concept of creativity, while valued, has been taken for granted for too long within the early childhood community? Perhaps this highlights the need for more interest and interrogation of creativity itself in the context of early childhood settings and its importance to 21st century learning?

Using ICT to support children with learning differences and to promote inclusiveness

I would love for this kind of technology to be used in the health environment between his specialists, doctors, therapists, so we can move away from a piecemeal approach to a more collaborative approach. The benefits would be enormous and everyone would be working together more efficiently and effectively.

(Parent, Meadowood Community Crèche report, p.16)

Inclusion has been defined in the context of early childhood education in New Zealand as:

A principle, an attitude and a set of processes that affirm the right of every child to develop and learn in accordance with the principles and values of Te Whāriki…. Inclusion acknowledges the fundamental validity of effective teaching and learning to include all children.

(Ministry of Education, 2000, p.45)

Inclusive education policies and practices mean that at any one time there are likely to be children in services with special learning requirements. Given that ICT can be a valuable resource for enriching learning and communication, it was likely to be of benefit for this small group of children and for facilitating inclusive education.

Collaboration between the service and family is important to educational outcomes for children in early childhood settings. In the case of children with learning differences, collaboration usually extends to several specialist professionals who work with the child and their particular disability. Any mechanism for collaboration that supplements the six-monthly Individual Education Plan meetings (IEPs) is likely to be of benefit in increasing the level of understanding and responsiveness to children's changing educational requirements. More recent Web 2.0 tools hold particular promise in that they allow observations, ideas and responses to be shared in real time.

The projects

Just one service, a community crèche, chose to investigate inclusiveness. However, there were a scattering of services that made mention of ways in which ICT had helped teachers with diagnostic assessment, or children to adopt more positive social behaviours.

Use of multimedia tools

The use of new media, in particular video, enabling voice and movement to be recorded, gave a fuller picture of children's achievements and learning in context. This was especially useful for speech or physical disabilities that are hard to capture through still images.

In Kirika's case, short video clips were copied to disc as a chronological record and viewed by her family and early intervention teacher. These provided a more comprehensive way of exchanging knowledge with families (including knowledge of cultural practices), interpreting experience and making informed decisions about future learning.

Kirika's story

Kirika was three when we began to use the video recording. These video clips were shared with Kirika and her mother at the end of the sessions. They were also shared with the visiting early intervention teacher and speech language therapist.

One experience with Kirika using the outdoor play equipment was recorded in a learning story. A similar experience was recorded using a video clip. The effectiveness of the video was evaluated by asking for comments from the parents and early intervention teacher along with evaluating the use of video to support individual plan goals. Increasing voice strength, confidence to use her voice and express herself, developing hand/finger strength and further developing peer relationships were goals of learning formed at Kirika's IP meeting. Just from this one video clip, each key worker was able to observe these goals being met and see documented evidence that supports her IP goals and celebrates her achievements.

Parent's comments: "When I saw how she used the climbing equipment at crèche, I knew when I took her to the park she would be happy."

"Great for non-English speaking parents to see how their child is progressing."

"Kiri was very excited, explaining what she was doing over and over to everyone who watched the video."

"Crèche children can't read teachers' comments in portfolio but it is easy for them to see and learn watching themselves on video."

Early intervention teacher comments: "I can hear and compare the child's voice."

"I can view events I might have not seen during a centre visit."

When the videos were shared at an IP meeting Kirika's mother noted that: "The digital dairies made it easier to set new goals."

And a teacher's comment on the diaries: "Digital diaries provide a strong voice in a system where they can often only be heard as a whisper."

(Meadowood Community Crèche report, p. 8-9)

The use of video also proved to be very effective in motivating the children to repeat activities or, as in this case, to practice speech and communication.

We found ICT to be invaluable for strengthening approaches to working with children with special learning needs. For example, a child who had few words initially was captured dancing on the video recorder. She enjoyed replaying this video clip many times and watching herself – pointing and exclaiming with one or two word utterances.

(Pukerua Bay Kindergarten report, p.12-13)

The use of blogs for collaboration

Meadowood Community Crèche found that video created large files that were difficult to share electronically unless they were put on disc. However, copying to disc involved another process for busy teachers and meant that the benefits of immediacy in sharing could be lost. Their solution was to set up individual, private blogs for children with special learning requirements. This was done only with the permission and full involvement of parents.

Their case studies demonstrated that the blogs, with their multimedia functionality, provided an opportunity for teachers and parents to work in partnership. Parents could now easily access children's documented experiences, often on the day they happened. Parents soon gained confidence in uploading material themselves and took responsibility for adding to this. This gave teachers a better insight into the children's and family's interests.

Teacher's comments:

"Not only do these videos/photos/learning stories provide 'visual' feedback to all those involved, but they can be accessed at any time. This can increase communication with all those involved and feedback/direction/ advice/goal setting can occur all through the year, not just at the meetings. It becomes an ongoing process."

Parent's comments:

"I was very hesitant at first with creating the blog…. imagine my surprise when I took to it like a duck to water and I have not looked back.

….and later…

I am so excited to get this video uploaded as it shows how quickly Nathan is trying new things and mastering them.

Thanks to all those involved as without this ICT, as I would not be aware of half the things my son could do."

(Meadowood Community Crèche report, p.10 and 12)

Specialists such as physiotherapists, speech language therapists and early intervention teachers also found the blogs very useful in building multiple perspectives around the children's competencies.

Commenting in one case study the teachers wrote:

> It also allowed physiotherapists to view the child using a walker for the first time in a centre setting and again two weeks later to monitor the progress. As a result there was dialogue between the physiotherapists about a possible way to increase stability. Jaden's dad saw possibilities for improving the functionality of the walker and modified it by adding a tray. This allowed Jaden to be more independent, able to carry objects when he was using his hands to move from place to place with the walking frame.
>
> Paediatric physiotherapist comments:
>
> *"Through seeing the video I can focus on the child, not just looking at what he can do, but how he is doing it. Even if I am present with a child, it is very useful to have a session of physiotherapy videoed for review and reflection."*
>
> (Meadowood Community Crèche report, p.11)

Children also gained from having access to their blog, as documentation could be revisited and each child's sense of themselves as a competent learner was likely to be reinforced. This is evidenced by this example written by Fynn's parents:

> *We have just finished sharing this clip with Fynn. He says 'Me swing, me stretch'. He also tells us 'Me monkey oo oo ah ah!' then he claps his hands at the end of the clip because he is so proud of his achievement. …*
>
> *P.S. Sharing the clips with Fynn helps us to reinforce his learning and achievements. The clips also provide motivation for Fynn to talk about what he has been doing as crèche. He is very excited when he talks about what he is doing. It is just fantastic!*
>
> (Meadowood Community Crèche report, p.13)

Use of image to help others understand and normalise disability

Harrison's example demonstrates how photos, an email from home and the use of a data projector helped his teachers and other children understand the process Harrison went through to be tested for new glasses. Importantly for his own learning, Harrison was able to describe the process himself – an approach likely to have left him with a sense of achievement and the knowledge that his 'disability' is respected and viewed positively.

These are a selection of photos Harrison used to recount his experience at mat time, using the data projector. (Onehunga Cuthbert Kindergarten report, p. 30)

Using ICT to help in diagnostic assessment

A small number of services indicated they had found programmes such as PhotoStory 3 and Kid Pix, which allowed children to record their thoughts, useful for diagnostic assessment of speech impairments.

In the case of William, a fascination with Spiderman was the motivator for his engagement with Kid Pix.

> We created a DVD with William, discussing his interest and it was clearly audible to hear that he required a speech therapist to develop his language further. Nonetheless, William found the computer to be a tool where he could choose and compose images of his favourite character, and discuss these with teachers and eventually his peers.
>
> This activity had a calming effect on his behaviour and encouraged him to talk more with both adults and children. It also appeared to help his confidence in socialising in a positive manner.
>
> (Favona Kindergarten report, p.13)

ICT facilitating social competence and giving children a voice

A number of services made reference to the way ICT tools gave some of their more reticent children the confidence to speak out or join in. It appeared that these children discovered a natural affinity with technology or enjoyed having an audience. This led to them becoming the expert amongst their peers, which in turn gave them more confidence.

> Tom can be quite a shy wee boy at times – but we have noticed that whenever the computer is involved he acts very confident and seems to be totally in his element.
>
> A great example of this was when the primary school teachers etc were at kindy for the ICT afternoon – Tom was very shy and quiet around these new people – but when asked to demonstrate the blog on the computer he stood up and performed this with great confidence – and was not fazed by all of the people watching him."
>
> (Parent, Fiordland Kindergarten report, p.38)

There were also some examples of teachers noticing how involvement with ICT appeared to mediate disruptive behaviour in some children.

> The teachers had been working for the past couple of months supporting a child with developing social competence. He was becoming aggressive towards other children, and his parents had voiced concerns about his behaviour at home towards his younger brother. We had tried a range of different strategies with this child and the parents were concerned as he was due to go to school within four months.
>
> When the children's computers were introduced into the room we noticed that this child had a real interest and strength with computer. He was already familiar with the basics of computer programmes, could follow instructions and was confident with the mouse. His prior skills and knowledge gave him confidence to become the support person for his peers.
>
> His relationship with teachers and peers became more positive and there was feedback from his parents that things were calming down at home. This child demonstrated leadership skills, an awareness of other children's capabilities, and his self-esteem and confidence was increased. All of a sudden he was an 'expert' that had so much to offer others and previous concerns about his social and emotional wellbeing are no longer there.
>
> (Kids Domain Early Learning Centre report, p.10-11)

Conclusion

There was a small variety of evidence to show that ICT can facilitate both social inclusiveness and positive learning outcomes for children with particular learning requirements. The multimodal nature of digital technologies and, in particular, the capacity to work with moving images and audio recording, appears to be particularly effective in diagnostic assessment and in supporting children's self-identity as a learner and contributing member of a group.

It was interesting, and perhaps of concern, that there were only a few references to special or inclusive education across the 56 services. It is unclear from the service reports if children with learning differences were being overlooked with regards to ICT experiences or whether they were simply not the examples that services chose to illustrate their investigations. However, in the evaluator's report carried out by Victoria University (2008), a similar disquiet was noted on the basis of observation, raising questions about teachers' awareness and facility to ensure equity is maintained regarding ICT in services.

The one service that did make 'special rights' the focus of their investigation provided useful evidence of the benefits of the interactive web for collaboration between the service, children, families and the professionals. They demonstrated that a practice such as blogging can be successfully used in a targeted manner. They did however suggest one proviso for using new technologies: consideration be given to ethical concerns such as respect for parent's choice to be involved in blogging and sensitivity and discretion when editing videos. The benefits of richer documentation, therefore, comes with increased responsibilities to consider aspects such as the longer-term impact of children's digital footprint.

The affective domain

The affective domain is the realm of feelings and emotions. In educational contexts it concerns how we respond emotionally to given learning situations, as opposed to *what* we learn, or *how* we learn it. It is clearly related to *Te Whāriki* and other curriculum discourses around attitudes, dispositions, confidence, sense of belonging and the like, and has obvious overlaps with the above discussion of children's empowerment and autonomy as learners. The 'affective' thus refers specifically to the emotional and motivational content of children's learning experiences and their sense of themselves as learners.

The research literature on the use of ICTs in education has identified a clear and persistent connection between children's use of ICTs for learning and a number of affective domain indicators like motivation, confidence, engagement and enjoyment. There is little doubt that learners usually enjoy using ICTs as part of their learning experience. Despite the fact that motivated engagement in a given learning activity does not in itself guarantee learning is taking place, nor does it describe what type of learning that might be, it is nevertheless generally regarded as a necessary or sufficient precondition for, and proxy indicator of, some sort of learning.

The last set of 'outcomes' for children that were frequently reported in the services' studies thus relates to the affective domain: how children felt about themselves and about their learning when ICTs were involved.

The projects

Very few of the action research studies took affective domain outcomes as their main focus, although one looked specifically at using ICTs to build children's 'confidence and competence', and another at children's 'dispositions' as learners. A great many more, however, either included some affective domain indicators in their analysis frameworks or identified affective domain outcomes as matters of interest in their findings.

The most prominent affective domain themes in the reports related to children's motivation and engagement in learning, their confidence and self-esteem as learners, and their sense of belonging.

Outcomes

Motivation and engagement

Many of the services reported high levels of motivation and interest associated with the use of ICTs for learning, and many found evidence of sustained engagement by children in the learning activities involved.

> Major revisited his portfolio, which contained a collection of his own photos. "I did that one, I did that one…"
>
> (Learning story. Lucknow Kindergarten report, p.15)

High levels of motivation were indicated, for example, in:

- the high levels of interest children showed in the technology itself
- many instances of child initiated use and choice of ICTs
- repeated use of 'favourite' ICTs or ICT-based activities
- repeat revisiting of work produced using ICTs, often involving changes, edits and improvements, and extensions into related activities.

> We began to notice how the ICT was becoming more a tool for the children rather then the focus. 'J' for example, had a huge interest in construction. Initially we would ask 'J' if he would like us to take a photo of his work. Then he began to ask us for the camera and take photos of his own work. He started taking photos of the different stages of his building, wanting to capture the whole building process. … 'J' also began to refer back to his photos, using them as a reference point as he tried to recreate his past constructions.
>
> 'J's focus was on construction as that is what interested him. 'J' was able to share his interest with the children at the centre, his parents as well as with his future school. He was able to revisit past learning, redesigning or improving upon past designs.
>
> Children have taken more ownership of their work, deciding for themselves what is 'valuable learning', and what learning/interests they want to follow on with. By trusting the children, allowing them to control their own use of ICT equipment such as computers, cameras and microscopes, children are able to build a sense of worth and pride about themselves. They see that they are trusted and respected enough to use ICT equipment.
>
> (Eastbourne Barnados Early Learning Centre report p 8)

Many services also cited evidence and examples of *sustained* engagement and perseverance in ICT-based activities. These included:

- longer amounts of time being invested in ICT activities than were often 'typical' of a child
- instances of perseverance recorded in learning stories
- expressions of enjoyment, pleasure and pride while engaged in ICT-based activities or when reflecting on ICT-generated stimulus materials.

"When we look at the blog together she shares with us so much more than what is recorded there… she loves going back over past activities posted there, she reflects on where she was at then and lets us know things have changed, that she's 'bigger' now."

(Parent comment. Otago University Childcare Centre report, p. 20)

The ICT use of the camera clearly supported Mackenzie's confidence to articulate her learning in a social context and her ability to transfer knowledge to new situations like home was immeasurable. Mackenzie was not only able to use the language of the HOM to reflect on her learning, she was able to recognise it in other children. She continued to plan by taking photos of other children she could see persevering in the playground and said: 'I took these photo's 'cos they were persevering. There were lots of things to get. It was tricky but they didn't give up.

(Geraldine Kindergarten report, p. 16)

Confidence

A second theme involved the self-confidence that was observed to come from children's use of ICTs. This confidence sometimes derived from their own successful use of the technologies (as in the self-pride they showed in successfully operating a piece of technology, or the status that 'expert' users of particular software packages were given), and sometimes from their responses to materials generated using ICTs (as when movies, pictures or computer-generated learning stories featuring themselves were proudly shown to parents and whānau at home).

We even found a dead bee and studied it under the digital microscope. But he still continued to go back to the bush with his two yoghurt containers. He watched bees run around the small plastic containers that are placed under the digital microscope. But was still not satisfied. The children all thought of Izach as 'The Bee Expert' and asked him questions and thought [of] him as fearless.

(Campus Creche Preschool report, p.28)

Sense of belonging

The third affective domain theme in the reports related to the children's sense of belonging, and for some, enhanced social interactions. Some services used ICTs in ways that fostered children's social connection with other children or adults at the service. This was a specific focus of the studies that looked at easing children's transitions within and from their service.

Teachers in other services used ICTs in ways designed to promote children's sense of belonging in respect of wider family, whānau or iwi community groups. Sense of belonging outcomes were often evidenced in the many studies that investigated ways of connecting services with their community.

Interestingly, while there were instances cited of one or two children *not* being especially interested in ICT-based activities, and not displaying high levels of engagement and perseverance, there were none recorded of any children whose motivations, confidence or self-esteem were negatively affected by their use of ICTs.

Children's sense of belonging is enhanced when they see themselves and their friends featured on the blog.
(Kidspace Early Learning Centre report, p.23)

Children who were reliant on non-verbal communication because they were not confident speakers of English benefited from having photos of familiar artifacts of importance to them.

Closer connections that developed between the teachers and families during this process assisted the teachers to gain cultural awareness and build meaningful relationships with children.
(Kidsfirst Kindergarten, Trengrove report, p.12)

The aim of building children's sense of who they are and their place in the wider community' is another of the pou [that] has also had its foundations firmly planted, the teachers feel, in the children's responses to retelling their pepeha. …The children … are also making their contributions to the making and telling of our histories. Tane Mahuta and our stories reinforce the ties across the Pacific.
(Yendarra Kindergarten report, p.24)

2. ENGAGING WITH COMMUNITIES

Community understanding of children's learning

The wider world of family and community is a fundamental part of the early childhood curriculum and is mutually supportive of the well being of whānau/families, local communities and neighbourhoods. Making children's learning experiences visible ensures that parents and whānau gain an understanding of those learning experiences, which in turn empowers children to become self-directed learners.

> *Families should be part of the assessment and evaluation of the curriculum as well as of children's learning and development. Parents and caregivers have a wealth of valuable information and understandings regarding their children… Children's learning and development are fostered if the well being of their family and community is supported; if their family, culture, knowledge and community are respected; and if there is a strong connection and consistency among all the aspects of the child's world.*
>
> *(*Ministry of Education, 1996, p. 30-42)

During the research process, many services investigated methods that were incorporated into the curriculum. This helped contribute to:

- forging, enhancing and maintaining links with the family/whānau and the wider world, in order to make children's learning visible
- giving children increasing opportunities to see themselves as valued members and contributors of their community.

There is an abundance of research suggesting that meaningful relationships between services and families contribute to the quality care and education of young children and equally, that parental understanding of their child's learning experiences is more enhanced when the learning has been made visible through ICTs (Hughes & MacNaughon, 2001, DeMarie & Ethridge, 2006, Boardman, 2007, et al).

The projects

Services focused specifically on developing relationships with family/whānau to convey children's learning to parents and the wider community, with the aim of making children's learning visible and to give parents/whānau an understanding of their child's learning progress. These relationships were often one-way and required little or no response from the parents/whānau, but offered them a deeper understanding of their child's learning through the visible nature of the communication using ICTs.

Outcomes

Services clarified that making children's learning visible for families involves more than creating a display of images of children's experiences. The practice of making children's learning visible actually entails creating documentation that represents children's thinking processes and explains their progression of learning, so it can be conveyed to parents in a comprehensive medium they can access and understand.

More than just play

When families are transitioning into early childhood education, much of the time is taken up with administration and management requirements and often the important aspect of the curriculum is overlooked. Presenting children's learning experiences to parents/whānau in formats that have been created using ICTs, such as photographs, learning stories and DVDs, makes learning visible and provides parents with a comprehensive understanding of how their child is learning through play.

Making learning visible

Services found that the sharing of visual documentation, such as photographs and video footage was effective at helping give families/whānau a better understanding of their children's learning. The investigations illustrate that the creation of photographs and movies using digital equipment also helps teachers to develop relationships with the children and to gain a better understanding of what interests them. Children become competent and confident users of ICT tools, such as digital cameras, and often request to take equipment home so that they can share and record learning experiences with their families/whānau.

Having noticed Faith's interest in the camera and acknowledging the skill she had developed using it within the Kindergarten, we responded by asking if she might like to take the camera home. When the camera came back there were photos of Faith and her brothers and sisters, and a much-loved cousin, "baby Jordan". We downloaded the photos onto the computer in the main room and ran them as a slide show… About a week later, Mum came in and saw the photos and explained that they were very special to the family, so we made some prints of the photos to take home. (Maraeroa Kindergarten report, p.16-17)

The visual nature of these documents and online tools encourages parents and whānau to spend time viewing their child's learning experiences, stimulating conversation between parent and child, and reinforcing learning experiences at home.

Saw Harry had been playing with slime at KIDSPACE. Teacher had been using tactile words to describe the experience. This allowed us to use the same words at home leading to strengthening his language skills.

(Parent blog comment, KIDSPACE report, p.14)

Feedback from parents and whānau demonstrated they were able to achieve an understanding of children's learning through viewing the documentation. The visual nature of photographs and videos recorded on DVDs and blogs, illustrates to parents how their child is progressing and the language used to respond incorporates key visual expressions, such as see, watch and illustrate. It is the visual nature of documented learning experiences, created using ICT tools, that enhances parental and whānau understanding of children's learning; and having an insight into their child's encounters at kindergarten eases any anxieties or concerns they may have had.

"The DVD is awesome and is a great profile addition that really enables you to see what they get up to."

"I can see the pride he has in showing his DVD."

"…it illustrates more clearly the actual process of certain activities/play sessions, how outcomes were achieved."

"I can see that he plays with more than just one or two children that he talks about…"

"L enjoyed seeing himself on the computer and wanted to see more."

"B loved watching his DVD and showing it to us and his Grandparents."

"I can see how much fun and joy he is having and it makes it more of a reality and I am really proud to watch him learning."

"It sometimes is hard for me to visualise how he learns stuff and the DVD makes it easier to understand the context it's in."

(Parental feedback, Mayfield Kindergarten report, p.7-12)

One Playcentre found that as well as making learning visible, it is also important to make the philosophy and ethos of the centre evident to ensure that parents fully understand the context their child is learning in. ICT tools were used to create posters that parents could access while visiting the centre to enhance their understandings of the benefits of mixed age settings.

Parental feedback indicated that displaying the poster ensured this:

> … parent community understands the positive values of mixed age sessions. In particular, older children developing empathy, compassion, consideration and nurturing of younger ones and that older children can learn to look after younger members which brings out the disposition of responsibility.
>
> (Atawhai Playcentre report, p.7-15)

Helping families with English as an additional language to understand children's learning

Language and cultural differences can create additional stresses for families whose first language is not English. ICT tools have created a method of conveying children's learning experiences that families with English as an additional language can understand. The creation of a DVD to communicate service information to families has seen positive results, with parents commenting that the DVD is:

> *…more helpful than the brochures* [because of] *…voice prompts and listening, rather than reading…Great!*
>
> (Parent, Sunshine Kindergarten report, p.13)

Parental/whānau understanding of their child's learning is of particular importance to children from families with English as an additional language because it ensures that children feel valued and confident about their learning experiences and they settle quickly into the learning environment. Bridging the language gap helps to ensure that children have a sense of belonging, this in turn ensures they have the confidence to explore their environment and investigate learning opportunities.

Tian Yi arrived in New Zealand at the age of three years speaking no English. He initially started in the afternoon session attending three afternoons accompanied by his Grandfather. The team used the usual strategies to establish a relationship of trust so the he could get a sense of well being and belonging. Initially his Grandfather, who also had no English, would stay with him.

Although there is some merit in this strategy we often find it can delay integration into the programme as the child continues to be very dependent on the grandparent limiting interactions with teachers and peers. After discussions with Mum, (who works full time), Grandfather slowly separated over a period of a few weeks and was able to leave Tian Yi alone at kindergarten. Initially Tian Yi kept to himself and the team would endeavour to spend time with him daily using appropriate picture books, language prompts and lots of body language in an attempt to engage him in the programme.

Tian Yi was then introduced to the digital camera. His excitement was obvious by the smile on his face and the amount of photos he took. We seem to have had a break through. There had been a particular group of children that Tian Yi gravitated to on most days. Unfortunately his lack of English and confidence made this challenging.

Critiquing his photos I realised that one boy in particular featured several times. I decided to use a photo story, mainly to support his English, giving language to activities and names of the other children…

The laptop was set up on the porch with a microphone attached and Tian Yi was encouraged to investigate. One of the first photos was of a boy called Bailey. Tian Yi, pointed excitedly and after a few stumbled words said Bailey…friend!" This came as such a surprise as he often appeared frustrated around Bailey and we had mistaken his frustration for dislike.

During the voice recording, several children came over to have a closer look. Tian Yi was suddenly the centre of attention. The photo story was played over and over and I sat back to observe the reactions. Because Tian Yi was smiling and laughing, his peers did the same. One little girl seemed to gain a deeper understanding of Tian Yi's level of English and repeated the narration from the photo story and directed it to Tian Yi and said "Good boy!" Tian Yi's popularity increased overnight…

This software gave Tian Yi such a powerful voice and clarified in some instances his understanding of English and our misunderstanding of his intent. For example, his desire to have Bailey as a friend, not a foe! From that day on the two went on many adventures together and the team were truly amazed at how quickly Tian Yi had accommodated the English Language. In this instance, technology was the enabler for Tian Yi to communicate and gain a sense of well being and belonging.

We showed the first Photo Story to Grandfather when he came to pick Tian Yi up that day. The very next day he bought Tian Yi's Grandmother in and pointed to the computer. On viewing the photo story, their body language indicated such a high level of delight and gratitude that I was a little overwhelmed. Grandfather kept shaking my hand and saying thank you. The following morning Tian Yi's Mother, Vallen, dropped in to view the photo story. Her English is reasonable but she works full time and we had only ever seen her once before. She was so grateful that his English was developing. "We only speak Mandarin at home…We have been very worried about his learning English."…

After the success of Photo Story, Grandfather started to come early to pick up Tian Yi but looked for helpful jobs to do around the kindergarten. He offered to cut the lawns, he fixed a broken part of the fence, washed dishes, swept floors. He often watched the teachers working with the children and then was observed doing the same with Tian Yi. This was observed one day when I had just made a calendar with a child who had less than 20 odd days until he was off to school. Grandfather then sat with Tian Yi and made a calendar working alongside his grandson learning the numbers together.

During this period, Grandfather and I had several significant conversation about his life in China from his youth, conscripted into the army, through to married life and being a humble 'worker' (as he called it) through to coming to New Zealand. I felt privileged that he wished to share his journey with me.

(Tian Yi, Sunshine Kindergarten report, Appendix 2, p.1-6)

Conclusion

Many services felt that their increased use of ICT in documentation resulted in better parent/whānau understanding of children's learning progressions through everyday experiences. It also highlighted the role of play in children's learning. Hightened parental/whānau interest was largely attributed to the capacity of ICT to tell a more visual story through photographs and video, and was found to be particularly powerful in instances where English was an additional language.

Children often shared the ICT-created documentation with their families and this gave parents a clear idea of the benefits of play activities that their child was engaged in.

While enthusiasm for the ability of ICT to communicate understanding of children's learning is in many cases justified, it also requires a caveat. Making children's experiences more accessible and real to families/whānau through digital technology is not in itself a guarantee that they will understand or appreciate the learning that is taking place. The need for teachers to be clear about the learning that they are aiming to encourage and astute about articulating this is as important as ever. Therefore, in this context of making learning visible, digital images are best viewed as an enhancement not a substitute for the written word.

Improving dialogue and connection with communities

Creating a reciprocal dialogue with parents, families, whānau and the wider community enhances opportunities to develop children's learning through opportunities for sharing, communicating and collaboration.

> *Observations and records should be part of two-way communication that strengthens the partnership between early childhood settings and families.*
>
> (Ministry of Education, 1996, p.30)

The projects

The research undertaken by the services involved in this project aimed to investigate how ICTs could be utilised to further enhance communication links with the wider community, and to determine if a new communication platform could elicit meaningful relationships that would improve children's educational outcomes.

Several methods of communication were used to create links and develop relationships with the wider community, but the most contemporary and perhaps one of the most successful was the creation of service and individual blogs. This Web 2.0 facility offered services an opportunity to store, revisit and share children's learning digitally and securely, exploiting a variety of mediums including photographs, video footage, voice recordings, text and children's learning stories, which were created using a range of software, eg PowerPoint, Kid Pix, ArtRage and Comic Life.

The foremost reason for services choosing to use a blog is because it creates the opportunity for readers to respond. It is not simply the process of sharing children's learning that is significant, but that parents can contribute to their child's learning through posting comments and adding stories, pictures and videos of learning experiences that occur outside of the traditional learning environment. As well as creating blogs, services also chose to communicate and share children's learning through e-mail, sending DVDs and learning stories home, and creating wall displays of children's photographs and printed learning stories to promote parental discussion at the service.

Some services took their investigation a step further than just making children's learning visible by seeking a reciprocal relationship where parents/whānau, teachers and children were able to interact freely, sharing experiences and events that occurred within the service and beyond. This was intended to not only strengthen existing relationships but to create a dialogue that is meaningful and supportive of children's learning outcomes through their emergent curriculum. Research questions were varied and broadly investigated how services could improve and develop relationships, with specific questions considering how a service blog can foster closer relationships with families and the wider community.

Outcomes

All of the studies that focussed on building relationships with their community through ICTs found that using ICTs to create new opportunities for communication enhanced and developed relationships with family and whānau.

Shared experiences

> *We are able to talk to the kids about what has happened that day, show them pictures, then stories start, they explain everything.*
>
> (Parent, KIDSPACE Early Learning Centre report, p.17)

Creating digital documents of children's learning experiences that can be shared via a blog, wall display or e-mail has given parents and whānau the opportunity to be involved in their child's learning process and enabled them to understand how ICT can be used for social, educational and cultural purposes. After viewing the documentation supplied by the services, parents often felt reassured that their child had settled into the early childhood setting and were at ease with the effortless way that they could engage in dialogue with the service and their child.

The global nature of the Internet means that children can share their experiences with people important to them worldwide. Manaia Kindergarten, for example, found that their service blog was accessed by many grandparents, both here and overseas, who "appreciated us posting on the blog to enable them to play a part in their grandchildren's early childhood learning" (Manaia Kindergarten report, p. 20).

One child with developmentally delayed muscular growth, wanted to share the sewing she had painstakingly created throughout a session with her Grandfather in England. To communicate her efforts and show her Grandfather his name sewn with a love heart and flower, she wanted to post pictures of her work, and her doing the sewing on the blog. The next day her Grandfather had seen the pictures, shared the blog story and address with relatives, and commented on his amazement at her wonderful work and incredible generosity. Five other viewers, including friends and family in England responded to the little girl, along with her physiotherapist in New Zealand who was able to see her skills in action in an authentic setting and respond with encouragement.
(Manaia Kindergarten report, p16)

The ability for family and whānau to connect with their child's learning encouraged them to document stories from home, which the child could share with the service. Such practices allowed children to see that their home life and service life were equally valued and respected.

Joel is a wonderful, quiet three-year-old boy. He loves to create, tell stories, and share his experiences from home. Joel socialises well with all teachers and children although he has found a select few 'best friends'. Joel will often come to Next Generation in the morning with his Mum, Michelle. Together they will find an activity to get involved with. Most often they will create with the play dough together. Joel and his family have really become involved in the blogging world that the centre has created.

Joel started off by helping teachers select photos, put together stories and captions for the centres daily diary. Occasionally Joel would talk into the microphone, telling a story about a specific image captured. As Joel became more confident with this task, he also became more vocal.

On the occasions that Joel had contributed to the centre blog, Michelle would leave a comment for the teachers to publish. One evening the teachers held a workshop for parents who wanted to know more about blogs and e-portfolios. Michelle came along. Then Joel got chicken pox!

Joel really wanted to show his friends what he looked like but was unable to come to the centre. So Michelle and Joel put together some photos and a story onto Joel's e-portfolio to share with everyone at Next Generation. Wow!

Michelle has started making use of free programmes that the centre has recommended so that she can add photos and stories about things that Joel may want to share with his peers. These have been put onto Joel's e-portfolio and Joel has offered to share these memories with his peers

Through the e-portfolio Joel has the opportunity to share two very important parts of his life, home and centre life, with his friends, his family and his extended family.

(Next Generation Childcare report, p.9)

Collaborative learning environment

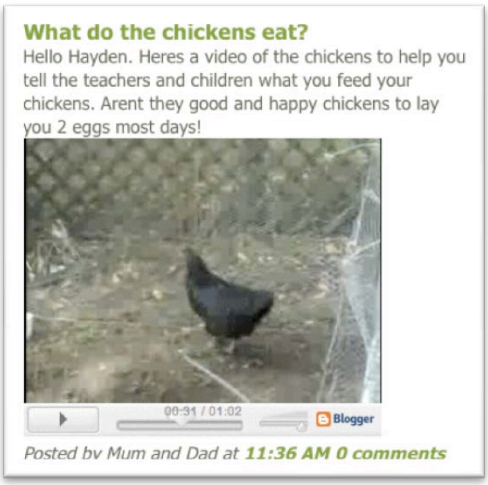
A number of services talked of families continuing similar experiences and discussions at home after viewing a particular learning episode that their child had been involved in at the service. Equally, there were examples where a posting on a blog had encouraged parents to come in and contribute at the service.

> Our intention has always been to encourage parents to contribute to their children's learning in the kindergarten. The blog has made this easier for many families. It has "blown us away" that parents have enriched our Kindergarten programme by being so involved through the use of our blog, in the every day kindergarten experiences. An example of this is the community's interest in fishing. The children's play has reflected this interest and they have shared this on the blog. Parents have noticed this interest on the blog and taken up the opportunities to contribute their knowledge and expertise in fishing through comments and by volunteering their skills at Kindergarten as a result. Children's interests have been challenged and extended through parent's involvement in the blog.
>
> (Manaia Kindergarten report, p18)

Giving parents access to children's learning through online documentation offered parents the opportunity to add feedback to the service through children's e-portfolios and blogs, developing a collaborative piece of work that both home and service could share and contribute to. Collaboration of this nature was often thought to be facilitated because of the immediacy with which these 'any time, any place' online tools allowed responses to be made.

Hayden, told a teacher all about his chickens at home. His knowledge of the chickens was extensive, however he couldn't remember what the chicken food was called. This was all captured on video, evaluated and posted into his e-portfolio. Later that day Hayden's Mum, Robyn posted to his e-portfolio. She was at home, and had videoed the chickens showing Hayden the chicken food and also talking to him on the video, reminding him what it was called so he could tell the teachers. After thinking about Mum and hearing her talk to the video Hayden started to miss her, so he phoned her for a chat. Again the conversation was captured on video and posted. Hayden has revisited these amazing videos often with both his parents and the teachers, cementing the learning in a meaningful way for him.

(Rotorua Girls' High School Childcare Trust report, p. 16)



Services that established blogs and e-portfolios all spoke of the need to work closely with parents during the set-up stage, and thereafter as new families entered the service. Finding out what ICTs families had a home and responding to some parents' concerns about Internet security issues, particularly when images of their child were being used, were an important aspect of developing blogs and e-portfolios. However, they were also tasks that staff were willing to commit to because they could see the benefits in terms of collaboration. After attending cybersafety workshops themselves, some teaching teams held tutorials to ease parents' concerns. Some services also offered workshops to assist in improving parents' technical knowledge and skill. Once the e-portfolios and blogs were set up and parents could see the benefits for their children, then services found that parents felt comfortable to participate in the project.

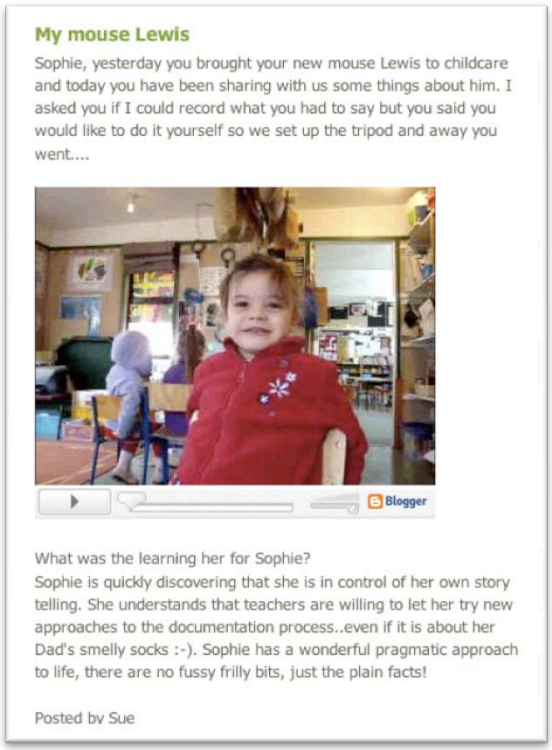
L just loves looking at the Blog and seeing all the children and things that have happened, she has noticed that she is not on them and tells us that she wants to be, so can I change the permission sheet and allow her to be put in the stories, that will make us all happy.
(Blog post from a parent, Greenwood Kindergarten report, p.16)

Empowerment

Those services that made extensive use of blogs and e-portfolios found that children understood the purpose of creating and sharing their learning progress and often requested to include items of interest to them. They seem to be encouraged and excited by the notion that there was an audience 'out there' who would read and see what they did. Children often requested to use the digital or video cameras to record their learning progress independently, with the intention of sharing this process with the wider world. Children took ownership of their learning and, in collaboration with teachers, made decisions about what learning experiences they wanted to explore and share with the wider community.

Since the one-week snapshot, of e-portfolios, Sophie's has developed her own culture of documenting her learning on her blog. She has videoed her work and talked to it, explaining what she has made and all of the important details that contribute to the complexity of the work. She then moved onto interviewing herself on video about her experiences with her mouse Lewis, and requesting that this be put on her blog. Sophie has gone from strength to strength in contributing to her e-portfolio, and role modelled this form of documentation and self-assessment to her peers. Sophie has a clear understanding of the purpose of her blog.

(Rotorua Girls' High School Childcare Trust report, p.18).



Reciprocal relationships

Services reported that using ICT for communication helped to build reciprocal relationships with family/whānau more quickly, and offered the opportunity for the child's voice to surface through parent and teacher documentation.

The goat visit

Grasslands Kindergarten said…

We had a goat visit on Tuesday. Renee naturally enjoyed this experience! Our wee animal/nature lover.

Blogger Sandra said…

Yes I can imagine Renee enjoyed the goat's visit. She is very much like her mother and loves animals. Did you know though that her Dad has taken her pig hunting (really a walk in the bush for the dogs) and she thinks she is a hunter now!

Grasslands Kindergarten said…

We can well believe it!!! lol Ally.

Renee's comment on pig hunting:

I like pig hunting. I went pig hunting with dad and his name is James but you know that. Thomas James is his name. We went at quarter past 8 but we couldn't go and see any pigs cause they weren't up. The dogs go fast.

Grasslands Kindergarten said…

Renee that was quite a story you shared with me…I just love your imagination and the way you describe things. Ally

Blogger Sandra said…

Thanks for that version of the pig-hunting story. We have a little girl at this kindergarten who has been duck hunting and her parents put a story about it in her portfolio.
(Grasslands Kindergarten report, p.9)

Creating a shared dialogue was found to be particularly useful for services working with babies and toddlers. ICT supplemented the vital face-to-face communication with visuals that helped parents to see their child's experiences more clearly. Services reported that this additional facility for communication enabled the expression of ideas that would not otherwise have been articulated. In one service (Tots Corner), teachers found ICT helped them to engage in a reflective dialogue about uncomfortable situations. The learning story below was emailed home to a parent and resulted in the parent reflecting on how she could support her son's learning experiences at home.

As Hamish makes his way over to the big outdoor area, he takes with him the ride along car that he has seemed to claim as his own! Toddling around, before noticing other trucks he likes the look of, he ditches the car to make a break for the trucks.

Time goes on and after a wee while he remembers 'his' ride on which by now another child is having a turn. Charging over there, with nothing else in mind but claiming his property, he yells and cries at them expecting immediately to "get it back".

As the child seems concerned at the intensity of Hamish's demands, he gets off to give the car back to Hamish. At this time I intervened and explained to Hamish that he will just have to wait his turn.

Teacher's reflection

Hamish your determination and strong mind sets you upon achieving your intensions. This definitely showed me that obstacles, such as older children do not seem to intimidate or hold you back, as you get right on in there stating what is "yours".

With our guidance and support we have persevered to build on your knowledge of taking turns and sharing with your friends. Your authority towards favourite toys is very strong and sometimes it's either your way or no way! In the end you tend to give in, realising that things aren't always going to go your way.

Well as time goes on, there will be pathways you will come across and social skills like the ones mentioned that will be of great use to yourself.

Teachers; Hanna and Kate

Parent's response

Hamish we like that you are 'determined' and if this aspect of your personality is channelled correctly (as your teachers are already doing), it will stand you in good stead in the future. We all have to learn that we can't always get what we want; although I know that sometimes Mummy wants to give you the world so that you never want for anything. However, in doing so, Mummy is doing you a huge injustice by not channelling your determination in the appropriate way. Dad is a lot better at this and perhaps Mummy needs to learn from him and your teachers how she can guide you better. We look forward to seeing the changes in your behaviour reflecting a more sharing attitude with toys etc as you learn to deal with your 'determined' spirit!

Love Mummy and Dad

(Tots Corner (Babies and Infants) report, p.20-21)

As well as allowing for collaboration with families, many services forged links with other early childhood/kindergarten services and local primary schools, creating reciprocal professional relationships. This link was of particular benefit for children about to start school as they were able to see pictures and videos of their school and communicate with their prospective teachers, which eased their transition into the school environment. This was valuable in rural services, where schools are not in close proximity. The ability to visit school blogs, or to chat over a Skype connection created sustainable and tangible links with feeder schools for some services.

One local new entrant teacher has been instrumental in leaving encouraging comments for our children and has used our kindergarten blog as a tool to get to know children who will be starting school. This teacher is the driving force for her school blogging journey and it has created reciprocal relationships between the new entrants' class and the kindergarten children. Recent blog posts on both blogs share stories of the new entrants' class coming over to kindergarten to read stories to our children.
(Manaia Kindergarten report p22)

Conclusion

Services reported that creating links and forging reciprocal relationships with parents/whānau and the wider community using ICT worked best when developments happened over an extended period of time, giving the opportunity for trialling these before implementing them fully. That said, using ICTs for this purpose was found to be viable and sustainable. Teachers have remained committed to developing their proficiency in using ICTs to build reciprocal relationships and have assisted parents with their skill development to ensure that families are able to continue to contribute to their child's learning by connecting experiences and learning from home. These new interactions were not used instead of other forms of communication, but were utilised in addition to other methods (such as book portfolios) and served to enrich the service, its relationships with the community and the children's learning experiences.

… ICT has extended the ability to connect relationships and establish communication lines, which in turn has extended children's learning, and their experiences and parents have been more involved and influenced in children's experiences establishing responsive and reciprocal relationships.

(Thames Early Childhood Education Centre report, p.22)

Easing transitions

Currently, educational transition is defined as the process of change that children make from one place or phase of education to another over time.

(Fabian & Dunlop, 2006, p.3)

Young children experience transitions from home to service, from service to service, and from service to school. They need as much consistency and continuity of experience as possible in order to develop confidence and trust to explore and to establish a secure foundation of remembered and anticipated people, places, things, and experiences.

(Ministry of Education, 1996, p.46)

Sustaining smooth transitions is important for children's well being and learning. It can be critical for determining children's future educational success. Previous writings suggest that the success of the child's experience of early transitions will make a difference to them in the initial stages but it may also have a more long-term impact and influence subsequent educational transitioning experiences, therefore highlighting the importance of successful early transitions.

The projects

Two services made the use of ICTs to ease transitions for children and their families the main focus of their research, with one addressing transitions into the early childhood service and a second concentrating on transition from the service to a school setting. There were also other incidental examples of ICT being used to support transition. A hospital-based medical care service had a secondary focus on facilitating transitions, and considered how to use ICT tools to make transitions from a neonatal unit to a medical care unit easier for children and their families. Several other services discovered that their application of ICT resources assisted with transition processes into, between or out of the service, although this was not necessarily a component of their research question.

Outcomes

Using a digital camera to facilitate transitions

A range of ICT equipment was utilised by services to ease transitions but the digital camera was one of the most frequently used tools to assist with difficult transition periods.

The digital camera is small and simple enough for young children to master quickly and easily, enabling them to take photographs of things that are important to them, both at the service and at home.

The images, featuring artefacts, people and places of importance to the child, were shared via e-mail or printed in individual portfolios, or displayed on the wall. Teachers noted that some children's anxieties diminished when they were able to access these images and carry them around.

The digital camera was utilised in a variety of ways to ease the transition process and teachers discovered that the camera was not only of benefit to the children who were having difficulty in settling into their new environment, but it was also of interest to children who settled immediately. One service found that although all children enjoyed using the digital camera, it was those children who found mixing with large groups difficult who benefited the most. The same service also indicated that using the digital cameras was of particular value in helping children who speak English as an additional language to settle, as the images became 'a way in' to shared conversations about things that the child knew about or was interested in.

The children often took cameras home and this initiated parental interest in the learning process and helped the child to feel more at ease about attending the service. The children brought the photographs of their home and family to the service and printed them out, put them in their portfolio or viewed them as a slide show. Children were able to refer to these images at times of stress and this process seemed to calm and reassure them. Children and teachers also took photographs of learning experiences that occurred whilst at the service and this was reassuring for the parents as they could clearly see that their child was happy.

Faamalele's story

Transition into Kindergarten can be a difficult time for children and their parents and whānau, as everyone adjusts to the significant change that is involved. We had often used the camera to gather some images of home for the child's profile book as a means of creating some conversation starters. It wasn't until Faamalele and her family joined us however that the true potential of using the digital camera to ease the transition process became clear.

Settling into the completely unfamiliar environment of Kindergarten was a challenging process for Faamalele and her family. Saying goodbye to her Mum (Susana) or Dad (Manao) was very difficult and would often require her parents to literally hand Faamalele over to the waiting teacher. With lots of physical and emotional support Faamalele was able to work through this, to the point where she would leave her parent willingly but clearly very upset. As the week passed, it became obvious that Mum & Dad were also struggling with saying goodbye and leaving their cherished daughter in such an upset state, even though they understood that she was cared for and supported through this difficult adjustment.

In the second week, Faamalele began to feel comfortable to occasionally move away from her support figure, and begin exploring the environment for very short periods before needing to return to 'touch base'. To reinforce Faamalele's growing sense of trust that "I'm ok in this place", and to reassure her parents that she was beginning to feel comfortable enough to explore the new (physical and social) environment, Jeanne decided to take some photos of what Faamalele chose to do one morning. She then showed them to Manao when he came to pick her up that day. As he stood with another father they looked at the photos together, smiling and speaking softly in Samoan. The other father then showed Manao his son's profile book, and this appeared to be reassure Manao somewhat.

The next morning as Faamalele's Dad prepared to say goodbye, he pointed her towards the puzzle that had featured in the photos from the day before. With support, Faamalele said goodbye, then together they went and printed the photos out (and laminated them and clipped them together onto a ring), so that Faamalele could carry them around with her. Faamalele's response to these images was almost instantaneous - she left the physical comfort of a teacher and walked around the Kindergarten freely, carrying her photos and initiating brief discussions about them. She also decided to make another 'ula' for her Mum, as she had been photographed doing the day before in one of the photos. The ring of photos were Velcro-ed into her profile book, which she then took home to share with her family.

The next day, Faamalele explained that she had shared the book with her brothers & sisters, and her Mum & Dad. Her Mum said they had all looked and talked about the photos. Later, after Mum had left and Faamalele sat with Jeanne, a great conversation was sparked (and shared with several other children) about Faamalele's brothers and sisters.

At this point, Jeanne suggested Faamalele take the camera home to take some pictures to share with us. Back came the photos of her family, and the slideshow was projected onto the whiteboard. An audience grew and Faamalele excitedly shared her photos with us her teachers, other children, and her Mum when she arrived to pick her up. As the days passed, Faamalele continued to carry around her rings of photos from both home and Kindergarten, but the need to draw on them for emotional support lessened, and they became more of a tool for sparking conversation. A quote from Jeanne "It felt like the 'walls' between home and Kindergarten were coming down!" Using the powerful images to create a tangible item that Faamalele could (literally) hold onto in times of stress/upset, assisted us to bridge the 'divide' between the familiar and unfamiliar.

(Maraeroa Kindergarten report, p.13-14)

When a child transitions into a new educational environment, it may not just be the child that feels apprehensive. Parents and whānau are naturally keen to see their child settled, happy and participating in the service's programme, and teachers believed that having parents/whānau feeling confident and optimistic about leaving their child could help alleviate the child's anxiety in cases where this was an issue. Services found that some parents' concerns were eased by showing them images and video footage of their child engaged in learning with others. As part of their action research, Kidsfirst Kindergarten (Trengrove) interviewed parents about the impact of welcoming stories made using ICT and sent home soon after a child started. Feedback on this practice included,

"Very reassuring to see George doing puzzles. That's his interest and it was good to know the teachers are on to it."

"Honestly, I don't think it made a difference either way to C, but it made me feel much more comfortable about leaving my child at kindy. Thanks for the reassurance."

"My children usually settle very well into new environments but Toby was a cause of concern to me because he has been very reluctant to attend preschool. He generally cries and clings and talks all week of not wanting to go. Given this, I was THRILLED with how happy he was at kindy, how eager he is to go and how comfortable he is when I leave!"

(Parents' comments, Kidsfirst Kindergarten [Trengrove] report, p.8-10)

Creating a DVD to ease transitions for the child and the family

Two services trialled the development of DVDs to facilitate transitions. At Otatara and Lucknow Kindergartens, a DVD that was given to families to watch prior to their child attending the service proved to be a particularly useful resource for affirming and extending connecting links. The DVD helped children and their families to feel comfortable with the routines, customs and regular events of the kindergarten. Families were able to watch the DVD together and in some cases they fed back that they had watched the DVD several times. The DVD gave children an understanding of what they could expect before they even attended any sessions and this made the experience seem more recognisable.

At the beginning of the term Mason started into morning sessions. He hadn't been to a pre-entry session, but on his first day he came up and asked when he would be able to use the hammers – 'you know', he said to me,' like on that thing you gave Mum at home'. He again referred to seeing it at home when he asked to work in the carpentry area again the next day.

(Teacher, Otatara Kindergarten report, p.11)

Parents explained that watching the DVD improved their understanding of the daily routines at the service and helped them to explain to their children what they could look forward to doing there. Parents also felt that introducing the teachers on DVD made them feel more assured about knowing what was expected of them in making it an easy transition for their child. Furthermore, they felt confident to approach teachers with any further questions or concerns that they had about their child attending the service.

"The DVD showed many things the kindy is strong in, introducing using te reo, the technology, healthy eating focus, independent discovery. It's great!"

"It introduced kindy to our child (who loved watching it) and gave insight to the parent who didn't visit in person. I liked the frames showing lunch, learning and interacting with the teachers (and the singing)."

(Parents' comments, Lucknow Kindergarten report, p5)

"The personal touches, talking about yourselves was nice and for a first time parent, very important."

"We liked the introduction of Kim and Michelle as it made us feel as if we 'knew' them a bit better."

(Parents' comments, Otatara Kindergarten report, p.11*)*

Easing transitions into school

A handful of services investigated how ICTs could be used to familiarise children with their new school before they begin attending and therefore ease the transition to school process. Kids at Play gave cameras to families going on school visits as part of their intention to make learning more visible through using ICT.

We give the camera to the families to take photos when they visit their new classroom. These photos come back to the centre to be printed so the child can show them to everyone and paste them in their books. This practice helps a transitioning child to view their moving to school as a positive experience and also involves their parents in the process.

Lucknow Kindergarten trialled the practice of creating a 'transition to school DVD' for individual children. This included a number of learning episodes collected over the course of the child's time at kindergarten and a summary of his/her strengths and interests. Although one primary teacher welcomed this resource, the Lucknow teachers concluded:

Generally feedback from New Entrant Teachers was mixed. Our understanding from this was that a request from us to view the resource only adds another task to a primary teacher's already very full teaching day. We felt our goal for it to encourage positive transition a little ambitious and stopped production of this brief Transition DVD. Instead, this Transition chapter has merged with the child's full leaving Digital Story. Now this can be viewed as the final chapter on the leaving DVD. We continue to promote this final chapter for sharing with their school teacher and classmates.

(Lucknow Kindergarten report)

School booklets

At Waiuku Kindergarten, ICT tools were used to create booklets that incorporated important images and information about the new school. The booklets incorporated key features of the school environment, such as the toilets and the water fountain as well as pictures of the children's new teachers. The children were able to access these booklets at any time and they often shared them with other children and their families to familiarise themselves with their new school. Children often used the books to reinforce previous visits to the school by telling teachers what they recognised from these visits. Whereas previously the service had only considered a transitioning process for children soon to start school, the school booklets gave younger children the opportunity to prepare for future transitions.

Dominic is off to school shortly and he has been on several school visits and is taking a keen interest in the transition processes. Here he is photographed looking at our school booklets with Raymond who is going to school the following year. Dominic is the initiator of this activity, and he has his particular school's (Pukeoware) booklet.

(Learning Story, Waiuku Kindergarten report, p.11)

Using Skype to create links with the new school

Some services found that Skype was a practical tool that allowed children to develop virtual relationships with a new entrant class and/or a new entrant teacher, as well as offering the opportunity to continue friendships that had already been established in the early childhood environment. Using video and Skype, children were able to see some of the school environment and talk to their future school friends.

Services using this tool for transition purposes reported that the children enjoyed the social aspect of the communication and requested to speak to previous kindergarten children, but also learned the names of other children who would be in their new class. This method of communication helped children to gain an understanding of school and class activities.

Although Skype was deemed to be an effective tool for helping children to become familiar with their new school, some teachers argued that it was not necessarily sustainable due to technical and timetabling issues between the schools and service. However, these teachers said that it was evident that the children found talking to their new school exciting and they wanted to continue these Skype relationships.

Today I was sitting down with Raymond, and we were talking about letters and school. Raymond remembered back to when he had Skyped with Room 10, and said, 'I want to do that talking with Dresyn'.

(Teacher's observation, Waiuku Kindergarten report, p.15)

Creating a blog for transition

At Waiuku Kindergarten, children posted learning stories about their school visits on the service blog and teachers discovered this was beneficial to the children as it opened up communication, developed links between the service and school and extended the transition time for children. The children's blog posts indicated they had an understanding of the transition to school process and the fact that comments could be added at any time meant that the service could continue facilitating the transition process once the child had begun attending school. Families were also able to contribute to the blog by adding comments and collaborating with the child to post stories about school visits and the first days at school, prompting conversation about the transition process.

After Spencer's learning story was posted it received comments from a previous friend from kindergarten, his Principal at school, and his relatives overseas.

(Waiuku Kindergarten report, p.16)

Easing hospital transitions for children and families

Families who are discharged from the hospital neonatal unit have almost an 80% chance of being readmitted into emergency care or medical care. Hospital staff created a DVD, using Moviemaker, which was screened to groups of parents as part of their discharge transition process. The DVD gave parents information about the journey of readmission to emergency care or medical care and prepared them for the likely impact of hospital on young children.

The team trialled the DVD with parents and then made some amendments to ensure that the information suitably prepared parents for the transition process and that their fears and misconceptions were alleviated. The DVD is now used as an integral component of the neonatal transition process and parental feedback indicates that the DVD is helpful for parents facing this difficult transition.

Showing the DVD in a group setting promotes discussion/support amongst families, it also gave the opportunity for parents to be parents in an unfamiliar environment.

"Practical information (e.g. about the ambulance and phone) encouraged independence of being a parent."

"Every parent should see this DVD and do the visit – I'm going to tell them all."

(Parents' feedback, KidzFirst Children's Hospital: Medical Care Unit report, p.21)

Conclusion

Prior to the ECE ICT PL programme, some services did not have a consistent transition strategy in place and often operated on an ad hoc basis. The professional learning programme has offered the opportunity to reflect on current practice, comparing it with what had been done previously. For some, this led to a shift in teacher thinking and helped them to align their practice with the principles of *Te Whāriki.*

While few services used ICT to facilitate transitions as the main focus of their investigation, those that did generally found benefits in doing so. In particular, ICT afforded the ability to create useful resources – photo collections, DVDs and booklets – that helped children and their families gain a sense of familiarity about a new environment before they began attending. Another advantage of using ICT was that children other than those being targeted for transition often got involved and so the whole process of transition became more fluid and integrated in the service programme. Where resources were made available on DVD and shared with families, the opportunity for children's preparation for transition was able to continue at home as well as at the service.

While the services believed that ICT added value to transition to school processes, they also pointed out that this value rested on the schools being willing and able to receive and use the information well. Services found this was not always the case.

As one said in their recommendations:

> *…realise that these relationships are dependent on personalities and therefore open to change, using even the most innovative ICT to enhance transition is on use unless teachers – school and ECE – place value on transition processes.*
>
> (Waiuku Kindergarten report, p 21)

3. PROFESSIONAL LEARNING

Using ICT as a means to reflect and refine pedagogy

Teaching is a profession and with any profession comes a commitment to lifelong learning and development. Just like ethical practice is part of being a professional teacher, so too is reflective practice. While ethical practice protects children, families, colleagues and teachers ensuring everyone's safety, reflective practice ensures that this same group of people gets the best possible teacher; one that is committed to best practice.

Reflective practice can challenge teachers' ideas and actions. It provides opportunity to consider whether practice is consistent with beliefs. It allows teachers to consider new perspectives and ideas as well as connecting theory and practice.

(Broadley & Fagan, 2010, p.1)

The projects

One service chose to investigate the use of ICT in reflective practice. This service already had a strong 'community of learners' culture and so ICT was investigated to extend this further. Individual teachers used the video function on their still cameras to record themselves interacting with a child or group of children. Teachers first viewed these privately and then with a colleague with whom they had a trusting relationship. Information gleaned from this process supplemented written reflections recorded in teachers' reflective journals. They concluded that video was particularly useful because it provided the opportunity to view recordings several times and therefore look at their practice through different lenses.

Through their videos, teachers saw some aspects of their practice that did not sit comfortably with their philosophy and subsequently addressed these. Examples included, the balance between child-initiated and teacher-directed interactions, length of response time teachers used, and the degree to which they extended opportunities for learning.

Some teachers were surprised to find that, despite their thinking that the interactions were mainly child initiated, the reality was they were very much teacher-directed interactions.

Using the video as a reflective tool has allowed the teachers to shift this practice. We found by using the video as a reflective tool, teachers were able to assess the waiting time they gave children to process and respond. Again, while teachers felt that sufficient time was left, in fact it was evident that this was not the case as one teacher describes:

"I asked one question and they have just started thinking. I haven't given enough time to start ticking the question over in their mind before asking another. James, four, said to me 'Tania, I haven't even answered the question'. When James made that comment I thought I have just done what I hate!" From viewing the video the teachers found they allowed more time for children to respond. Teachers are more aware of what they are saying.
(Massey Childcare Centre report, [Kiwi and Kea sections] p.9-10)

In some services the ability for teachers to see and review their own practice was a by-product of their video work with children. In this example, video was being used to investigate ways in which children's problem-solving capabilities were developed in the service.

One outcome we did not foresee was the powerful reflective tool video provided for teachers. Not only did we have debate about the role of the teacher in the video process but it also allowed the opportunity for teachers to reflect on their own practice when they took on the role of active participant.

Did teachers jump in too soon to provide children with the solutions they needed? Did they allow them time to think?
Were teacher's interactions safety focused?
Do teachers have confidence in children finding their own solution?
Or were teachers driven by a desire not to allow a child to fail?

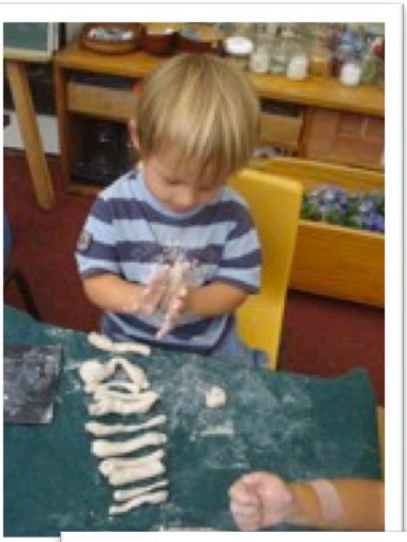
This provided a lot of food for thought for teachers in all interactions with children. It has allowed us to reflect on our own practice and make changes. Allowing children to have the time and space to find their own solutions, as well as encouraging children to take calculated risks, is now part of our everyday practice. Using ineffective strategies and having a tool such as video to recognise them can provide a powerful learning opportunity.

(Jonathon Rhodes Kindergarten report, p.14)

Use of photos for reflecting on practice

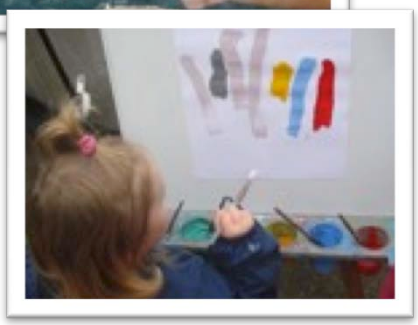
One service with a strong culture of professional collaboration examined ways in which digital photos could become a focus for provocation, not just for teachers but also children and families. They found they were able to use a series of photographs to see the direction that learning could take and then use this in their planning.

Collaborating together as a team is very important for all the teachers at Tots Corner, and we share many opportunities during the day and allocated non-contact time to communicate about shared learning experiences for both children and teachers.



We take time to view photos and video clips giving us opportunities to see where certain interests of the children maybe extended—how small groups are constructed eg which children prefer to work together, which children like to work in small groups and those that prefer solitary play.

Recently viewing these photos and video clips has enabled us to see how many children appear to have a passion for visual order in their play and in their artwork. We have looked deeper into this through observations and professional readings.



A teacher reflection:
Revisiting photos on the computer, we noticed that several children have a passion for visual order. This represented itself in many areas of their play. For example: lining up small cars, animals, blocks, clay, construction, peg boards and art work.

To increase our knowledge in this area, we have been researching topics around this (eg. schemas and mathematic concepts, whether it occurs in art) to link theory to our practice. We have discussed how this could impact on our planning. This is something we will continue to observe and document.

(Tots Corner report, p. 28)

Trusting children to use resources

For many teaching teams, learning to trust children with the ICT equipment was the beginning of a significant shift in their pedagogy. Several reports talked of learning to let go of control of the equipment and being surprised by children's capability to use resources responsibly themselves. They talked of a shift towards more balanced power relationships between teachers and children as a result of their trust. This in turn afforded children opportunities for planning, decision making and having responsibility for doing important work, as this example illustrates:

> The biggest changes during our research came when we started to release some of that control back to the children. We were able to discuss ideas with the children, explore new avenues with ICT and have fun once the teachers shifted in their thinking. We needed to allow and trust in the children's ability to be respectful of the technology (which they were) and value the exploration they could do with control of the ICT use.
>
> The single biggest shift in the teachers' learning was during a visit to the fire station in 2007. When planning the trip we decided to give complete control of the trip photography to the children. The teachers would not take any cameras at all and two children were chosen to be the photographers. During a group time we discussed with the children what kinds of things they expected to see and made a list of possible photos the photographers could get. It was a very nervous time for the teachers as complete trust was placed in the children to document the trip through photography.
>
> The trip went very well and the photos the children took were exceptional. When reviewing the photos it became very clear the different ways in which children see the world. One of our favourite photos was of a Policeman that basically looks up his nose, because that is what children see!
> (Greenwood Kindergarten report, p.15)

Taking steps to trust children with equipment was often something that teachers considered through seeing examples of this happening in other services. In the case of handing over cameras to children, attaching lanyards to these seemed to be a practice that helped put some teachers at ease.

When we began this project the children had no cameras. The staff shared one digital camera amongst four teachers. Therefore the children did not use the camera very often. Visiting other centres and reading several articles started the change of our ideas, values and beliefs.

...One of the biggest changes in our physical environment was providing lanyards and hooks for the cameras in the centre. Children could see and access the digital camera whenever they wanted to use it.

(Halfway Bush Kindergarten report, p.11)

ICT is relatively new as a curriculum activity. Whereas all teachers will have had experience of literacy, mathematics and science in their own education and life, that cannot be assumed with ICT. In this sense, ICT is unique amongst curriculum subjects because early childhood teachers may well be starting with a level of experience and skill that is similar or perhaps less than the children they teach. Therefore, building confidence and capability in ICT often has to precede attention to improving pedagogy.

Changes to pedagogy

It appears that once teachers had gained confidence in using particular ICTs they were more able to reflect on the role they themselves played in enhancing outcomes for children through this interface. Bolstad (2004) suggests broad areas in which the quality of early childhood pedagogy could be examined. These include the quality of interactions, the strength of the relationships, and the quality of physical and material resources made available.

Many services made general comments about teachers now responding to children as 'confident and competent' or recognising how instrumental their own role was in achieving effective outcomes for children. Several described they had altered group-time practices to include children's greater contribution to planning and presentation. A few illustrated more specific ways in which teachers had made changes to their practice. Here are three examples:

We have changed the way we set up our environment to cater for interests, being aware of children's thinking and values. We have had to examine our own values and beliefs about early childhood. As we realised that our children were truly competent we started providing less teacher directed activities and provided materials that allowed them to make their own discoveries.
(Riversdale Kindergarten report, p.14)

We developed a much clearer understanding about questioning and ways to encourage children's thinking rather than lead it. We are watching more and questioning less, which gives children much more chance to lead their own learning and explore the possibilities with ICT. We learnt to allow more time for children to experience and learn, and that many children will come to the experience at different times. Some taking hours or days to wait for the initial rush and crowd to lessen.
(Greenwood Kindergarten report, p.15)

We have found new ways to expand upon and enrich our interactions with children, especially in the area of revisiting children's learning and allowing children to have a louder voice in their own learning and development. There is a more even relationship between children and teachers. The child's opinion and interests are more easily heard and respected, with the teacher taking a step back to allow the child to step forward.
(Eastbourne Barnados Early Learning Centre report, p.12)

Conclusion

A small number of services provided evidence of how ICT – video and photos – could be used to support teacher's reflective practice. Interestingly in these reports, two of the services that provided evidence of ICT being used in this way were those who already operated a strong culture of reflective practice.

The evidence indicates that using ICT can be a very powerful tool for reflection but it is also scary for many teachers. A pre-requisite appears to be having trusting relationships and a willingness to interrogate one's own practice.

However, teachers turning the spotlight on themselves in the use of ICT may not be the only way in which digital technologies can transform pedagogy. From the evidence provided in these reports, it seems that when teachers recognise how capable children can be using ICT they are then prepared to amend their beliefs and practices, giving children more autonomy and control over their own learning. There was some evidence of this change rippling out into activities beyond ICT.

KEY FINDINGS FROM THE TEACHER SURVEYS

THE IMPACT OF THE EARLY CHILDHOOD EDUCATION INFORMATION COMMUNICATION TECHNOLOGY PROFESSIONAL LEARNING (ECE ICT PL) PROGRAMME

This chapter considers the impact of the Early Childhood Education Information Communication Technology Professional Learning (ECE ICT PL) programme and summarises the findings of a comparative analysis of baseline, mid-project and end-of-project surveys (completed by teachers at the beginning, mid-point and end of the programme respectively). In each case the survey consisted of two questionnaires:

- A questionnaire completed by the Lead Teacher of the ECE ICT PL programme in each of the services taking part, profiling the range of ICTs available in participating services.
- A questionnaire completed by each of the teachers in the services taking part in the ECE ICT PL programme, profiling the range and level of use of ICTs for teaching and learning, as well as teacher capability (attitudes, confidence and skills) with regard to ICTs in the participating services.

Demographics – services

Just over half of the 60 services involved in these surveys are kindergartens and just under half are education and care services. One of the participating services is a Hospital early childhood service and one, that joined the project after the original baseline survey was conducted, is a Playcentre.

Demographics – teachers

The baseline survey was designed and conducted by the ECE ICT PL team and completed by all 59 participating services and 283 of the teachers in the programme during term 1 of 2007. The mid-project survey was completed by 56 of the services and 247 participating teachers in 2008; and 46 of the services and 245 contributing teachers completed the end-of-project survey in 2009.

The surveys gathered data on three areas of change across time:

- ICT capacity (what ICTs the services have)
- ICT capability (how able staff are to use the ICTs)
- ICT usage (what teachers and children do with ICTs including learning outcomes for children).

The specific indicators of capacity, capability and usage for which change was measured in the surveys were:

- For services:
    - ICT facilities available in the services (these ‘facilities’ consisted of hardware only. Services were not asked to provide information about their holdings of educational or administration software)
    - the location of these facilities within services
    - the main users of the facilities.

- For teachers:
    - levels and types of use of ICTs for administration, teaching and learning in their services (including the range of learning outcomes involved in use of ICTs by or with children)
    - teacher attitudes towards ICTs (including their goals for the programme and any particular concerns they have about the use of ICTs for teaching and learning)
    - teachers' confidence about their use of ICTs, both personally and for teaching and learning
    - teachers' levels of skill with a variety of ICTs commonly found/used in educational contexts.

The key findings

Technical infrastructure in services

Since the start of the programme, services have significantly increased their stocks of computers and other ICTs – most of this increase has been in relation to ICTs located in play areas.

There has been an increase in the number of laptops available for children's use – at the start of the project 38% of services had at least one laptop available in children's play areas and this increased to 59% by the end of the project.

The majority of services possess at least one digital still camera, printer, scanner and video camera with a significant proportion having acquired three or more of each of these provisions. Many services have also increased their range of ICT tools, for example, webcams have increased from 7%–52%, TVs increased from 22%–69% and digital microscopes increased from 14%–78%.

The least prevalent educational technology in services for children's use are interactive whiteboards, with only 4% of services having access to this resource. Other mobile technologies such as cell phones and iPods are still not widely used as a teaching and learning resource across most services; however, these provisions have seen a slight increase, suggesting that services are slowly immersing a wider range of ICTs into the learning environment.

In contrast with the baseline survey, when most technologies were located in offices, the majority of technologies are now based in services' play areas. Digital cameras, laptop computers, photocopiers and digital microscopes were the technologies used most by children in all surveys.

The level of broadband access has increased from four fifths to almost all services having access to a faster web connection, with the great majority of services (91%) providing Internet access via wireless networking.

Usage of ICTs in services

Both ICT use and ICT capability in participating services have increased significantly since the start of the project.

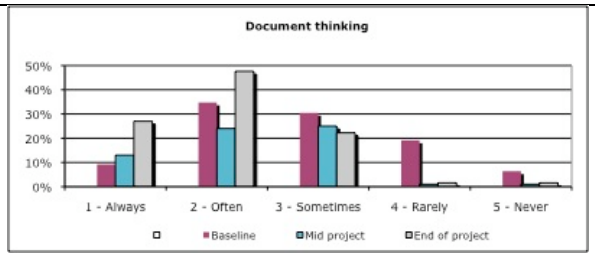
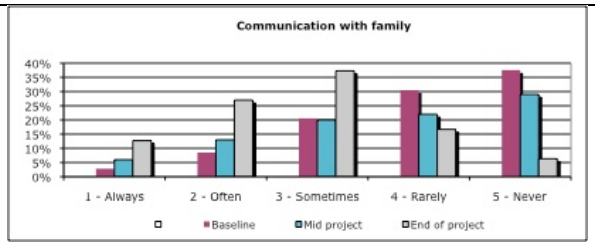
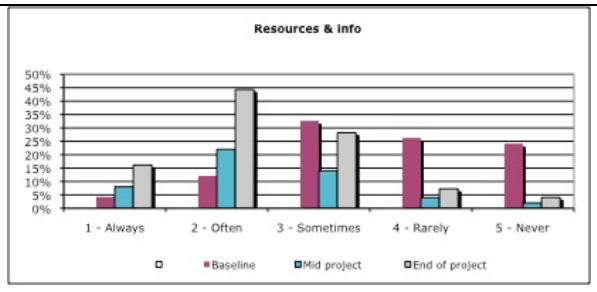
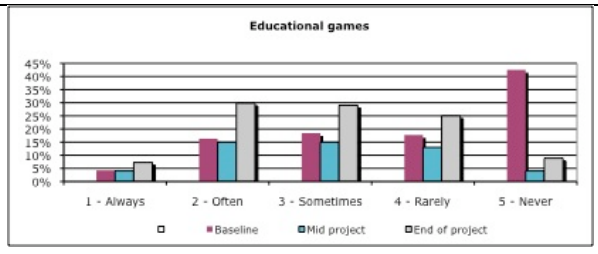
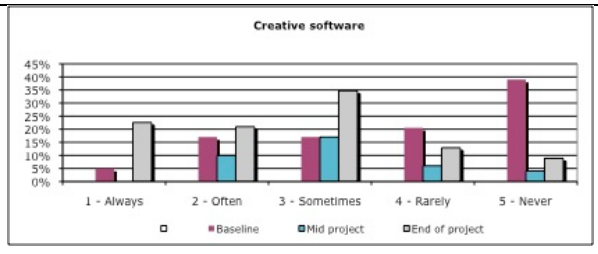
Teachers' use of ICTs for all of the professional tasks investigated increased significantly. The greatest teacher use of ICTs is for assessing and documenting children's learning, with 94% of teachers using ICT for this purpose and many teachers also using ICTs to successfully complete service admin (81%).

Interestingly, the greatest proportional increases demonstrate that the use of ICTs is progressing beyond the service, with 77% of teachers regularly using ICTs to effectively communicate with parents and whānau and to help create strong links within the local community.

ICTs for teaching and learning with children have seen even greater increases than by teachers use for professional administration. The most frequent use of ICTs with/by children is for documenting learning, especially through the use of digital still cameras and the co-writing of learning stories. At the end of the programme, over three-quarters of teachers report that their children routinely use ICTs for this purpose.

The greatest proportional increase in children's use of ICTs is in the exploration of creative software. Almost half of the teachers surveyed indicated that the children regularly use ICTs for this purpose. Exploring educational games remained the least used function.

Chart 1. Use of ICTs with/by children in services throughout the programme

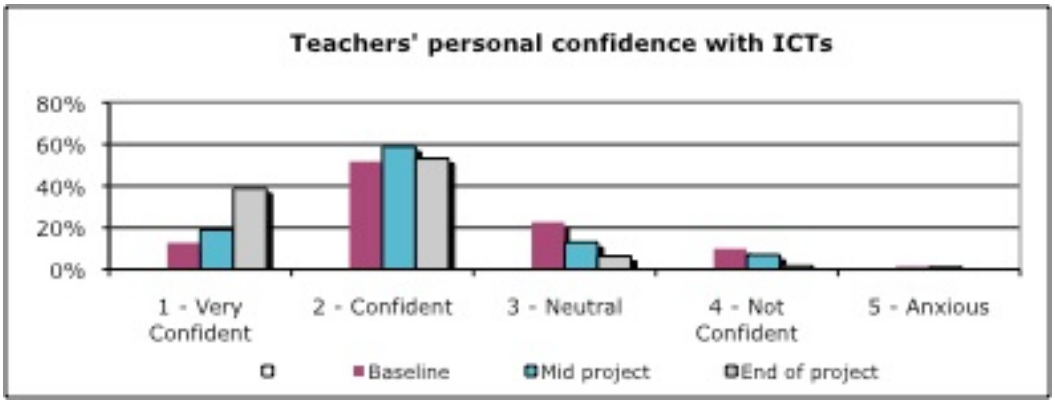
	**How often do you involve children in the use of ICTs?** To document their ideas, thinking, experiences, eg. children taking photos, downloading, recording their 'voice', using an interactive whiteboard.
	To communicate with their families/ whānau, eg. children sending emails and faxes.
	To find and develop resources, eg. children researching on the web, making games, making their own books.
	To explore educational games, eg. Little Brown Bear Series.
	To explore creative software, eg. Kid Pix, Artrage.

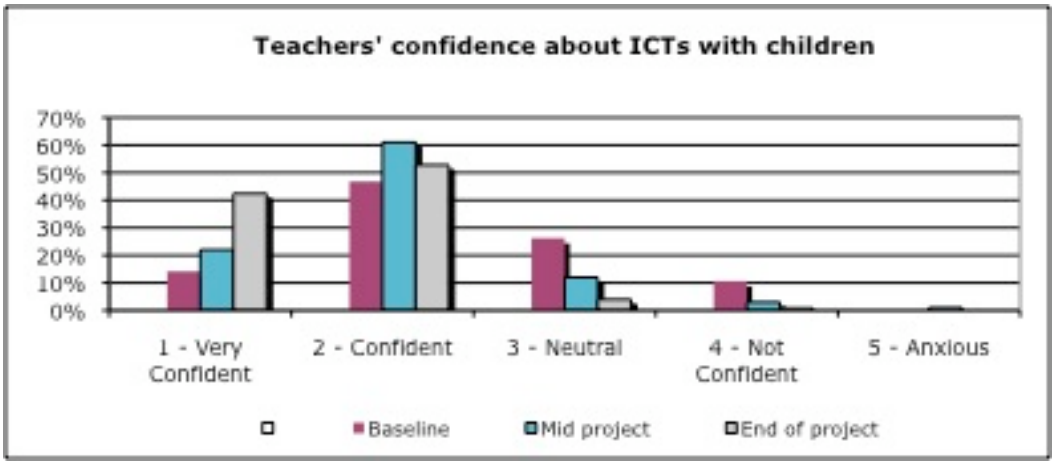
Teacher attitudes to ICTs and their use for teaching and learning

At the mid-point of the programme, teachers reported being more concerned than they were at the beginning of the programme about the lack of time for integrating ICTs into their programmes. By the end of the project, teachers were still just as concerned about the lack of time but were also significantly concerned about an ongoing need for professional development and the need to keep up-to-date with required skills and knowledge on ICT developments. Teachers were also concerned about a lack of finances for resources and technical reliability, but were less concerned about a lack of ideas on how to use ICTs in their programmes and making links between ICTs and quality teaching and learning.

Over the duration of the programme teachers' confidence levels increased significantly in regard to both their own personal use and use by/with children. By the end-point the vast majority (80%) of the teachers were 'confident' or 'very confident' about their own and/or children's use of ICTs, and very few (4%) were still 'not confident' or 'anxious' about these.

Chart 2. Changes in teachers' confidence about their personal ICT use and about ICT use with/by children

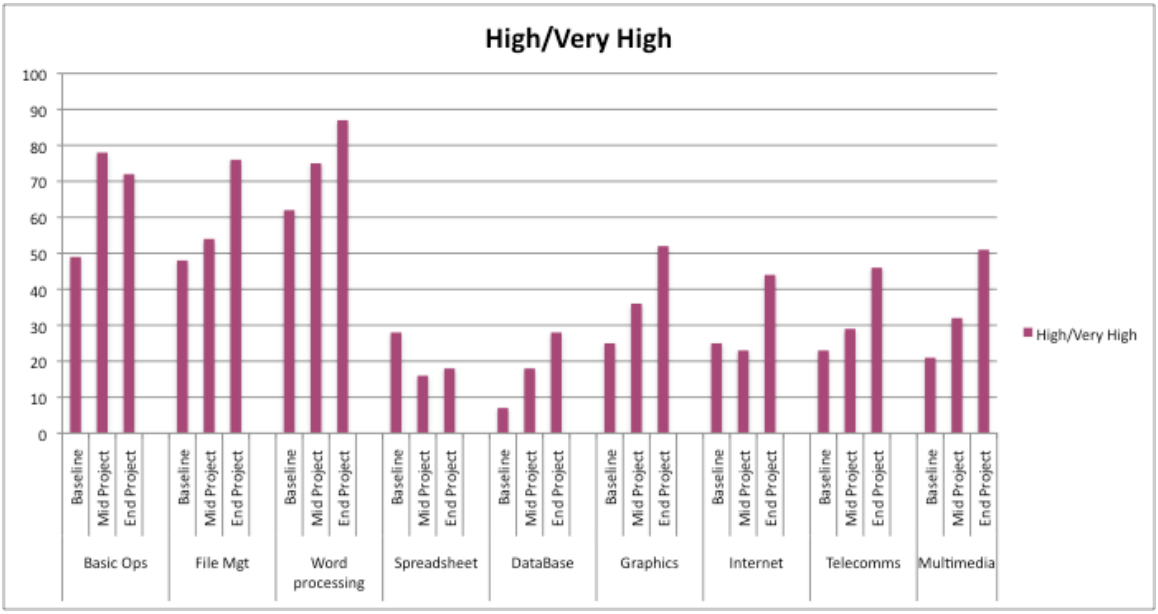




Teachers' ICT skills and ability to integrate ICTs into teaching and learning

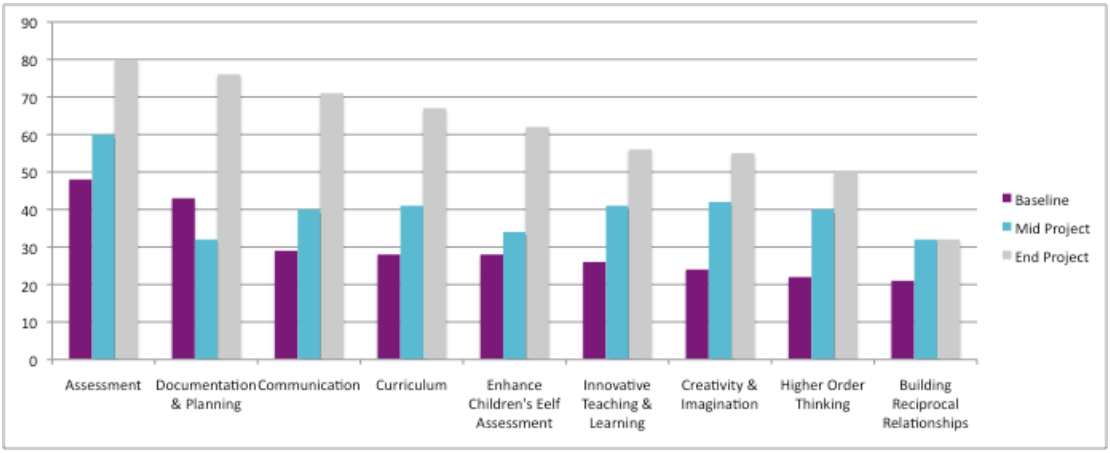
By the end of the project, reported levels of 'moderate' or 'better' competence have stayed stable for word processing, basic operations, file management and databases. Reported increases in skills were greatest with respect to Internet, spreadsheets, graphics and telecommunications, and there has been a slight decrease in levels of confidence with multimedia presentations.

Chart 3. Percentage of teachers who reported 'high' or 'very high' skills throughout the project



There have been substantial increases in teachers' rating of their Technological Pedagogical Content Knowledge (TPCK) since the beginning of the project, over all of the specific knowledge or children outcomes listed. Teachers continue to feel most 'skilled' at using ICTs for assessment of learning. Their levels of pedagogical ability increased the most in relation to using ICTs to support documentation planning and communication.

Chart 4: Changes in proportions of teachers reporting 'high' or 'very high' ability in integrating ICTs for a variety of pedagogical and learning outcomes



Ongoing professional learning

Teachers gained confidence and skill the longer they participated in the programme, thus, as a result, offering learning opportunities that were appropriate and engaging for young learners. The confidence and skill levels of participating teachers had increased significantly in most areas. Almost a third of teachers wanted the professional learning programme to continue after it had finished to ensure that they were able to maintain high levels of confidence and skill when using ICTs in the classroom environment.

Overall, the services continue to run relatively up-to-date computer systems. Windows/PC machines continue to be in more services than Mac machines; and Mac Operating Systems continue to be more proportionally common in kindergartens than in education and care services. Macs are also in more services as laptops than as desktops.

Table 1. Proportions of services running Windows/PC versus Mac platforms

Desktops. Windows/PC	Desktops. MACOS		Laptops. Windows/PC	Laptops. MACOS
87%	39%		78%	48%

Qualitative results

In their responses to open-ended questions, asking them to identify the most important gains they have made from the programme, teachers identified a fairly wide range of gains.

Teachers identified a fairly wide range of qualitative gains from the programme:

- deeper pedagogical knowledge (most prominent gain)
- substantial increases in teacher confidence and competence in relation to ICTs
- increased use of ICTs for a variety of curriculum purposes/service purposes
- significantly increased levels of integration of ICTs into children's learning programmes
- a much greater focus on the children themselves using ICTs for learning
- more critically reflective practice as teachers.

A small sample of what teachers identified as gains from the programme:

> *More confident with use of ICT; children's involvement with ICT; ability to share their increasing knowledge with others; communicating with other professionals about ICT; integrating ICT into teaching and learning; increased knowledge about ICT and its use; giving children opportunity to explore new and exciting learning and media; providing more areas for communication and sharing/children.*

More confident in use of ICT; children have learned processes such as making slideshows in Kid Pix and have gone on to teach others – peer tutor; empowerment – they go on to be leaders in other situations; they are confident; using data projector to show children's learning; making of slide shows; teachers 'letting go' and allowing the children to take the photos on the camera, we have become co-learners.

Children use the digital camera to take their own photos then go on to make slide shows, ibooks and mini movies with their photos; empowerment of children; children are experiencing success in the area of ICT and this spills over to other areas in the curriculum i.e. playing games outside; children are taking responsibility for their own learning.

Teachers' knowledge and children's knowledge has increased; collaboration between teaching teams; a tool for reflective practice; children are able to drive their own learning more; there is opportunity for reflecting and revisiting previous experiences.

Greater confidence; language and social skills development; the programme has deepened my understanding of children's learning, especially in the higher learning bracket; greater skill level; leadership and the ability to effectively share our journey through dissemination; powerful problem-solving opportunities; digital documentation of their own learning and interests; teachers can offer learning experiences seen or observed at professional development courses or online.

Providing children with a voice that isn't dependent on mastery of language; there is an evident rise in peer tutoring as children teach others what to do with the tools; reflecting on the basic nature of what teaching and learning is, so that we can build on it; being flexible and trying to work smarter; providing ways to revisit over long periods of time; offering high-order thinking tasks, as children record what they have done after the event – offering the story; children are more able to share in other's learning experiences as well as group work/ ICT as a provocation for learning experiences is very evident.

More confident with technical skills; raised levels of overall technical skill; new ways of literacy learning; raised teachers' levels of self-image and confidence in themselves as learners, able to take on new skills and knowledge; enhanced teachers' leadership skills; able to access answers and follow up interest areas quickly; new ways to be collaborative; heightens children's problem solving skills.

RECOMMENDATIONS FROM SERVICES

Services were asked to provide recommendations for others embarking on a similar journey of exploration involving ICT for teaching and learning. The following represents the frequently mentioned suggestions.

- Being a 'techie' type of person is not as important as having a willingness to learn new things, do things in a different way, give things a go and have fun.
- A team-wide commitment is necessary to ensure an ICT-rich culture is supported in any educational context.
- It is easy to get distracted by the big, bright and shiny world of digital tools. Consider carefully whether they will all add depth to learning experiences or will be merely a novelty.
- Planned and strategic induction procedures for new teachers to climb on board will ensure the culture is not lost.
- Discuss changes with the service community to ensure greater participation and support for innovation and change.
- Ensure cybersafety education for all teachers goes hand-in-hand with the exploration of technology.
- Role model cybersafety practices, advocate for cyber-citizenship and keep parents informed about how cybersafety is addressed.
- Participating in the development of policies and procedures around cybersafety will help teachers/adults to clarify their understandings of areas of potential concern.
- Be prepared to learn from children.
- Adopt a buddy system within staff to build ICT capability.
- Ensure that there is strategic planning to address funding for ICT equipment, maintenance and upgrading as well as teacher professional development.
- Take change slowly so that whatever is begun is sustainable.
- If considering blogs or e-portfolios, be prepared to trial these first for manageability – with teachers and/or with a small group of children.

FINAL COMMENTS

The ECE ICT PL programme had three intended outcomes. These can also form a useful framework for summarising the content of the service reports.

Increased ICT capability

When it comes to teacher professional learning, ICT offers different challenges from other areas of the curriculum because of its relative recent association with education. Whereas teachers would be expected to have some experience and background in most content areas of an early childhood curriculum, this cannot be assumed with ICT. Therefore, building teacher capability is an important first step for many teachers wishing to integrate digital technologies into their programme. The services provided strong evidence of increased teacher capability, child capability and less, but still significant, evidence of parent/whānau capability as a result of the programme. An important element of capability is developing an awareness of cybersafety issues and practices. Many services made reference to their increased attention to this aspect as being a positive outcome of the professional learning.

It was clear from the reports that for a number of teachers, building capability involved a step before gaining the skills and knowledge to use ICT. They first needed to be convinced that ICT even had a place in an early childhood programme. Worries about the health risks of children having too much screen time, doubts about the value of ICT to learning for children so young, and a personal fear of ICT were the reasons given for this nervousness. It appears that hearing 'real' stories from other services and seeing the enthusiasm and competence with which children embraced ICT themselves helped to change these perceptions. Having a well-defined purpose for using ICT was important also.

Evidence of children's increased capability in using ICT was also strong across the reports. However, because of the nature of early childhood programmes, where children largely choose the activities they engage in, some children took up the opportunities offered to build their capability more than others.

Transformation of pedagogical practice (linked to ICT) that leads to an enhanced community of practice

This tended to be a goal that services addressed once they had some confidence in using the ICT equipment themselves. With time and the support of the facilitator they were able to move from the 'what?' (ICT) to the 'so what?' (does using this mean for practice) and finally to 'now what?' (do I need to change).

Learning to trust children to use the equipment responsibly, where this had not previously been standard practice, was often the catalyst for re-evaluating the teacher's role. Hearing stories from other services in their cluster – through workshops, hui and the Ulearn conference – about how 'capable and confident' children can be with ICT, was also helpful in transforming teachers' practice. Being willing and able to take risks and try things out – a culture fostered by good leadership – was another affordance for pedagogical change, as was the whole-service approach to professional learning taken by the programme.

Several services talked of ‘shifting the balance in power relations’ and giving children more opportunities to ‘lead their own learning’, rather than have this controlled by the teachers themselves. Children presenting and leading mat times was an example sometimes used to illustrate this shift.

Teacher-child interactions are regarded as one side of the ‘iron triangle of quality’. A number of services indicated that teachers had made changes to the way they interacted with children as a result of input from facilitators, an outside specialist brought in as a guest speaker at a hui, or the multimedia function of some technology that allowed them to replay their interactions. These experiences often prompted teachers to listen more, be less directive and give children space to voice their ideas and thoughts. Some teachers also amended their use of questions to make their interactions more conversational.

Enhanced learning outcomes for children

The reports were full of examples of ICT being used to enrich children’s learning experiences. Often this was learning that was not exclusive to the inclusion of ICT but which could be generated by any resource that was being used in conjunction with wise teaching. In other words, it was the teachers *and* the tools that led to enhanced outcomes.

The added value of ICT was often the diversity it provided in terms of learning opportunities. For some children it offered a voice or ‘way in’ to becoming more engaged in the service for the first time, while for others it enabled them to re-fashion their existing interests in new ways. Much of the children’s learning reported by services was in the social, emotional and communication domains. This possibly reflected the emphasis on these in recent times through *Te Whāriki* (1996) and *Kei Tua o te Pae Assessment for Learning: Early Childhood Exemplars (2004) – early* childhood exemplars rather than the extent of the usefulness of digital technologies in and of themselves. Although using ICT to support subject knowledge learning was not a major focus for teachers across the reports, the one area that did surface quite frequently was literacy.

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APPENDIX 1

APPLICATION FORM FOR ECE ICT PROFESSIONAL LEARNING PROGRAMME

APPLICATION FORM FOR EARLY CHILDHOOD EDUCATION INFORMATION & COMMUNICATION TECHNOLOGY PROFESSIONAL LEARNING PROGRAMME

Please ensure that you have read the following:

- **Foundations For Discovery - ICT Framework For Early Childhood Education;**
- **Guidelines for Making an Application to join the ICT Professional Learning Programme for Early Childhood Education.**

Before submitting your application, ensure that you:

- **Understand the commitment and capability required to be part of the programme;**
- **Answer all the questions;**
- **Sign the form at Section 6.**

Please post **three paper copies** of your completed application and all related information to:

Carrie Matthew
Ministry of Education
Tertiary, Curriculum Teaching and Learning
Early Childhood Education
Level 12, Vogel Building
8 Aitken Street
PO Box 1666
Wellington

It is recommended that you keep a copy of your application and any supporting documents for your own records.

This form is available in Microsoft Word format as a downloadable file from our website www.ece.govt.nz or you can request the form from Carrie Matthew by email at carrie.matthew@minedu.govt.nz.

If you have any queries regarding the application process please contact Ann Hatherly ann.hatherly@core-ed.net

All information will be treated as confidential.

For Ministry use only	
Applicant	Date received:

Published by the Ministry of Education in October 2005.

The information is accurate at the time of publishing buy may change.

SECTION 1: ABOUT YOUR SERVICE

1.1 What is the name of your ECE Service as it appears on your licence?

1.2 What is your Ministry of Education unique number as it appears on your licence?

1.3 What is the physical address of your service?	
Street / RD#:	
Town / City / Area:	Postcode:
Daytime phone:	Fax:
Email:	Website:

1.4 If different from above, please give the mailing address for correspondence:	
Street / PO Box / RD#:	
Town / City / Area:	Postcode:

1.5 What is the name of the licensee of your service?	
1.6 What is the name of the contact person within your service who will deal with this application and correspondence relating to it? The person named here must be authorised to answer queries and to sign the paperwork relating to this application.	
1.7 What is the position of the contact person within your service?	

1.8 What type of service is your service?	*Please mark one box*:
Education & care service	
Kindergarten (full day / sessional)	
Home based network	
Playcentre	
Kōhanga Reo	
Correspondence School	
Other (please specify):	

SECTION 2: CURRENT APPROACHES AND CAPABILITY

2.1	**Write a statement that describes the understanding of learning that underpins programmes in your service. Give us some examples that demonstrate how your approach to children's learning has been successful for children in your service and their families.** (2 pages maximum please)

2.2	**Describe the experience your service has had with ICT to date and the capability of management and/or educators to use ICT to support learning.** (2 pages maximum please)

2.3	**Provide 2 to 3 examples of how your service has networked with other services, schools, community and/or facilitators. Describe the nature of the networking and what impact each example has for building capability and enhancing children's learning and outline key challenges experienced in networking.** (2 pages maximum please)

2.4	**Describe your service's capability regarding key factors for successful participation in the ECE ICT Professional Learning Programme. This may include factors such as: reputation for effective practice, leadership, commitment of management and teaching staff, time to meet, stability of staffing, understanding of the role of ICT in learning, ability to engage in action research, ability to document, report and disseminate outcomes from the programme, capability to manage change, capability to take on the additional tasks and responsibilities associated with the programme.** (3 pages maximum please)

SECTION 3: ECE ICT PROFESSIONAL LEARNING

3.1	**What are the key capability outcomes that your service plans to achieve from the ICT ECE Professional Learning programme?** (2 pages maximum please)

3.2	**How will your service make sure that the capabilities developed and implemented by involvement in this programme are sustainable in your service once the pilot is completed?** (1 page maximum please)

3.3	**How will your service further develop ICT capability once the programme is completed?** (1 page maximum please)

SECTION 4: ABOUT YOUR INITIATIVE

4.1 Initiative description: Describe in full the initiative your service would implement within the ECE ICT Professional Learning programme and tell us how it fits with your current work and future plans. Why has this particular initiative been selected? (2 pages maximum please)

4.2 Initiative outcomes: Describe the outcomes expected to be achieved from the initiative regarding ICT capability and children's learning. (1 page maximum please)

4.3 Indicative planning: As far as possible, set out an indicative plan that shows key objectives and tasks, anticipated timeframes, key roles and responsibilities and monitoring processes for the proposed initiative. (2 pages maximum please)

4.4 What is the main ICT that will be used in implementing the initiative? Please mark one box only in the 'main' column. If appropriate, please tell us what other ICTs are involved in the initiative and mark as many boxes as apply in the 'involved' column.

ICT	Main	Involved	Currently owned	Purchase planned
(Digital) Still Camera				
(Digital) Video Camera				
Personal Computer				
Internet				
Laptop				
Telephone				
Fax				
Mobile phones				
DVD and/or DVD player				
CD and / or CD player				
Other (please specify):				

4.5 Service input: Tell us about any investment (time, personnel or money) that your ECE service will be making in implementing the initiative and show how these relate to the tasks / requirements of the initiative. (1 page maximum please)

SECTION 5: ADDITIONAL INFORMATION REQUIRED

5.1 List the groups of people consulted in the preparation of this application (e.g., educators, parents, management, schools, researchers, ECE associations/organisations). Describe the consultation that was undertaken and the outcome of the consultation. (1 page maximum please)

5.2 Provide the names and contact details of three referees. Referees will be asked how your service demonstrates effective practice and could sustain ICT PD responsibilities for 3 years.

5.3 Any other information relevant to this application? (1 page maximum please)

5.4 Please submit three copies of this form and three copies of the following additional information:
• A copy of your centre licence or network charter. • Your current philosophy statement. • Your most recent Education Review Office Report. • Evidence that there is regular non-contact time for meetings, including time for staff to meet as a group. • **One-page** outline of staff professional development for 2005 and Professional Development plans for 2006.

SECTION 6:

6.1 This application must be signed and dated by the person named in Section 1.

Your statement:	**Tick here**
I have read the guidelines that accompany this form and to the best of my ability understand the commitment involved if my application is successful.	
I have completed all the relevant questions on this form.	
All the information in this application is true and correct.	
If anything changes which could affect this application I will inform the Ministry immediately.	
Management and teaching staff in my service support this application.	
I have the authority to make this application on behalf of the ECE service named in section 1.	

Name (printed)		Signature	
Position (if relevant)		Date	

APPENDIX 2

ICTS IN ECE SERVICES CASE STUDIES

A'oga Fa'a Samoa

Using ICT to support Samoan language

Puzzle of practice

There are limited Samoan language resources in all areas of education. Creating ICT resources that Samoan children can access and understand to enhance their learning, as well as share with their families, is important for increasing their use of the Samoan language. How can we support children's Samoan language, interest and learning through ICT?

What was investigated?

The teachers involved the children in creating resources in Samoan, including books and DVDs of digital stories and songs. A daily newspaper was created for parents, to record the events of the day using digital photographs and slide shows of the photos were set up on a laptop at the end of the day for children, parents and staff to view. Teachers used software to increase the visual impact of their learning stories. The impact of these initiatives were assessed through analysis of the artefacts created and through reports of case studies. Parents were asked to report back to the centre to record any incidents of their children using ICT.

Conclusions

Through this investigation, teachers and parents were able to see how children's Samoan language developed through their use of ICT and children were able to practice telling their stories in Samoan by recording their voice alongside the slideshow they created using Kid Pix. Staff and children created a number of Samoan language books using ICTs and this has supported and extended the children's confidence with language. Teachers emailed the pictures and books to parents and this has encouraged them to speak Samoan with their children at home, which has also created a stronger interaction with the centre and parents/whānau.

Allenton Kindergarten

A Community Explores Multimodal Literacy

Puzzle of practice

The children had limited access to classroom ICTs and the teachers were often very hands on and in control of the tools and therefore the child's learning. ICTs help to create a rich literacy programme and children should have open access to ICTs in order to develop skills that will ensure their later success in school and provide them with a lasting love of literacy.

What was investigated?

Children were introduced to a variety of ICTs, (hardware and software) and developed a firm understanding of how to use each tool to their best advantage. The teachers gathered data by creating indicators that enabled them to identify how ICTs had enabled the children to share their stories. Four children were observed using ICTs and parents/whānau gave feedback.

Conclusions

Children who have open access to ICTs have a stronger voice and share and revisit their stories both in kindergarten and with the wider community. The children were highly motivated and actively planning their own learning using the ICTs available to enrich their literacy. The principle of tuakana teina (the more experienced teaching the less experienced) was evident, enabling children to guide and support each other with the use of ICTs and igniting further interest in literacy.

Ashburton Baptist Early Learning Centre (over two)

Our Journey into the Information Superhighway: From the Wilderness to the Infinite

Puzzle of practice archaic

The children were using the cameras but little or nothing was being done with the images. Teachers recognised that they needed to value the children's images and use them in ways that were accessible to both children and their parents. They were also conscious that using the children's images might be a way to identify 'what next' for the children.

What was investigated?

Five children, who had shown a particular interest and were competent with using the camera, used their images to create slideshows on DVDs that they could view, review and share their with their family and whānau.

Conclusions

The creation of individual slideshows on DVD had an immediate and positive effect on the children's confidence. Parents and whānau were amazed at what their two year olds could achieve and all children involved have continued to show an interest in using cameras at home.

Ashburton Baptist Early Learning Centre (Preschool)

Our Journey into the Information Superhighway: From the Wilderness to the Infinite

Puzzle of practice

ICTs are now seen as an integral part of society and have an increasing role in learning and in the lives of families. We wanted to ensure that children leaving the centre for school would be capable and confident users of digital technologies.

What was investigated?

A small group of children were observed using ICTs to see what they were showing interest in, what skills they were developing and if they were sharing their skills. The teachers analysed the data together by answering specific questions about each child and applying the collated data with the strands of Te Whāriki to see what patterns emerged.

Conclusions

Children were able to use the ICTs responsibly, safely and confidently, and shared their knowledge with those around them. As the children contributed to each other's learning and the development of how to use the computer they also developed more complex communication skills, turn taking and negotiating skills, learned how to give instructions, praised and supported each other and learned how to better express themselves.

Ashburton Baptist early Learning Centre (Under two)

Our Journey into the Information Superhighway: From the Wilderness to the Infinite

Puzzle of practice

It is important to make connecting links with home, family and whānau for infants and toddlers, as they require a high degree of continuity in their lives. After purchasing new ICT equipment we wanted to determine how we could enhance the family and whānau understanding of the child's learning.

What was investigated?

After a positive response from a family to a trial DVD that was made of their child at the centre, each teacher in the Under Two area selected one child and made a DVD containing images and video clips of the child's experiences. Text explaining the significance of the learning was added and the DVD was sent home with a questionnaire asking the families if their understanding of their child's learning was enhanced by the video presentation.

Conclusions

The parents and whānau indicated that they enjoyed the DVD and the children responded enthusiastically to it, but the parents did not necessarily feel that it enhanced their understanding of the learning. This was in stark contrast to the 'trial' DVD that had been made for one family. The teachers identified the fact that the 'trial' family had had input into the content, as a possible significant difference in the way the DVDs were received. For the teachers, the DVD was a positive experience as it enabled them to clearly see how the children were progressing over the period of time that the video clips were taken, and identified the importance of involving families in assessment.

Atawhai Playcentre

Inspiring and Empowering Parents

Puzzle of practice

Children were leaving the centre at 3 or 4 years of age because parents were not aware of the benefits of Playcentre up to school age. Information about Playcentre was given through verbal introductory talks to families when their children started at the centre. How could we demonstrate the benefits of mixed aged settings and communicate the way our Playcentre philosophy shapes, supports, and enhances children's learning through the use of ICT?

What was investigated?

There were two parts to this research project, firstly a poster promoting the advantages of mixed age settings was created and displayed in the Playcentre and parents completed a questionnaire asking them about the poster. Secondly, team members collected footage of parents actively involved with children. The videos were then given to parents and a questionnaire was created for the parents to complete prior to viewing the video and again to follow up the viewing of the footage. The intention of repeating the questionnaire was to ascertain if watching the video helped parents' understanding of the benefits of children learning alongside their whānau.

Conclusions

The data gathered in response to the poster displayed at the Playcentre indicated that parents better understood the positive values of mixed age sessions, particularly the advantages for older children. The findings from the second part of the project indicated new insights into parents' understandings of children learning alongside their whānau. In addition to the research, ICT use has been incorporated into the programme as a means of extending areas of play and for adult communication. The conclusion is that ICT can play a useful role in the Playcentre, however, it requires a strong financial infrastructure from the outset.

Bayfield Kindergarten

This is What I Can Do!

Puzzle of practice

We were interested in children contributing to their own assessment. We wanted to use "their language rather than our language". We were aware that in much of our assessment it was only the teachers' and parents' voice that was visible and wanted to start with our 2-year-olds to find out more about them.

What was investigated?

2-year-old children were given the opportunity to recall learning from visual photographs, that either they or the teachers had taken, enlarged to A4 size and in black and white. These photos were on display in the kindergarten and also available for the children to carry. The teachers recorded the children's verbal and body language responses to these photographs, and whether they used the experience to take the next learning step.

The second component involved children talking with teachers about what they thought they were good at. This was recorded with a large A4 photograph and children then talked with teachers about why they thought they were good at this experience.

The teacher then analysed why the children thought they were good at something against indicators in Kei Tua o te Pae Book 4 – Children contributing to their own assessment.

Conclusions

The photographs enabled the children to share their thoughts and have also prompted them to reflect on their learning with their peers. Children are now initiating wanting to use the camera to record their learning and the teachers are getting to know the children better through their stories. Children were able to identify what they were good and they used indicators such as 'being fast' and 'having fun' as measures of being good at something. The data also indicated that children were very aware of the need to practice to become good at something. ICT enhanced the process through the exclusiveness of the photograph and its very visual nature.

Bayview Kindergarten

The Story of Empowerment

Puzzle of practice

Literacy and language have always been a strong interest of the children and teachers at Bayview Kindergarten, and it continues to be a big part of the kindergarten culture and programme. We wanted to see how ICT could be used to further enhance and extend oral literacy for the children.

What was investigated?

The teachers made use of a data projector, photos and the Internet as a means of extending children's oral language. Data was collected in a variety of forms, such as learning stories, parent/whānau feedback, photographs and children's voice/video clips. The data was analysed in relation to key oral literacy indicators including children's use of descriptive language, evidence of children's listening and questioning, conversation, instructional language, expressive language and presenting to others.

Conclusions

Displaying the photographs on a large screen created a safe environment allowing children to feel confident to express themselves and ask questions. The process of sharing the photographs has promoted oral literacy through questioning, conversation and expressive descriptions of the images. The use of the Internet (e.g. You Tube) for research purposes gave teachers and children new information that then inspired further oral language. Not all children were interested in using ICTs but for those who were it took them into new areas of engagement within the centre.

Cambridge Early Learning Centre Trust (The Pagoda)

Nothing Ventured, Nothing Gained

Puzzle of practice

Children demonstrated an already established interest in emergent literacy. Families were requesting a greater literacy focus in the programme, which led us to wonder how the capturing and sharing of children's emergent literacy using multimedia could support and strengthen literacy in our programme?

What was investigated?

PhotoStory3, PowerPoint and Flip Video were used to make digital stories. Teachers guided children through the story building process. Completed stories were either emailed home or copied onto a disk. A laptop was also accessible for children to revisit the stories. The value of these stories was analysed in relation to children's use of ICT and the literacy events they generated. Parents' response was also sought.

Conclusions

Photostory3 gave children the opportunity to express and develop their ideas, recognise that the spoken word can also be represented by symbols, making phonological connections with individual letters, predict the sequence of the stories and identify key words. Video clips of the children's learning experiences also helped to develop children's literacy skills by allowing them to revisit and critique their visual, and oral literacy development. Using ICTs also identified additional learning opportunities such as collaboration, improved social skills, turn taking, empowerment and creativity.

Campus Crèche Trust (Preschool)

Who's Teaching Whom? It's Never too Late to Join the ICT Roller Coaster

Puzzle of practice

Although the teaching staff are well qualified in the field of early childhood education, many were not confident using ICTs and most of the resources available were limited to teacher use only. Staff wanted to develop skills and confidence with using ICTs to support their philosophy of an emergent curriculum, enabling children to be autonomous and self-assured learners.

What was investigated?

Quantitative data was collected at the start of the research to assess what assets and skills were already in place and being used effectively. ICTs such as digital microscopes and cameras were made available to children to support spontaneous emerging interests. Teachers developed skills in using the equipment themselves. Evidence of the part played by ICT in building teacher's capability and in facilitating the emergent curriculum for children was highlighted through case studies.

Conclusions

Once the teachers have the skills and knowledge to use ICT tools effectively, they feel more confident to allow the children to pursue their learning interests through the use of ICTs. Children feel empowered that they are able to use the resources to carry out research independently and find answers to questions that they have posed. The digital camera and the digital microscope are particularly useful tools for supporting children's emergent curriculum as they enable children to capture their learning events as they happen and to revisit and reflect on that learning.

Campus Crèche Trust (Toddlers)

Who's Teaching Whom? It's Never too Late to Join the ICT Roller Coaster

Puzzle of practice

Children were not using any type of ICT for exploration. The digital microscope that had been purchased a year ago was locked away in a cupboard, as none of the staff really knew how to use it. Inspired by stories from other centres we wanted to aid the children's natural curiosity and investigation by putting it into use.

What was investigated?

The microscope was positioned in the science area and made available to children everyday. The children were observed using the equipment and data was collected about who initiated using the microscope, whether or not other children were involved or interested, what they were looking at, where it was being used, whether or not a snap shot was taken and whether or not the children viewed the image on the large screen. A second stage of observation looked more specifically at the children's learning and investigation of the natural world.

Conclusions

The data showed that the children started using the digital microscope with assistance from the staff and by the end of the recording period (four months) were using and initiating it by themselves. Children were encouraged to closely inspect the natural environment and living things and this has ensured that they have gained a deeper knowledge about the objects that they

studied. The process of discovery has also improved the children's social and communication skills as they talk to others about their discoveries and learn to take turns and share the equipment. Giving children the opportunity to explore and try new things using ICT has developed their confidence and capabilities allowing them to respond to their questions and ideas.

Campus Crèche Trust (Nursery)

Who's Teaching Whom? It's never too Late to Join the ICT Roller Coaster

Puzzle of practice

Part of our Nursery team mission statement reads, 'We value open communication and reciprocal relationships with whānau, which foster the best learning and nurturing outcomes for all'. This led us to ask, how can we further develop and strengthen communication with families/whānau using ICT?

What was investigated?

ICT was used to create a 'parent voice' template for portfolios and a photo board for children and parents. Data was gathered from semi-formal discussions, children's portfolios, 'parents voice' templates and further communication with parents. The data was analysed relating to the following indicators; sharing information about what was happening for the child away from nursery, sharing interests (through family voices), sharing children's milestones, sharing requirements for their child and making enquiries.

Conclusions

Improving the family/whānau voice template saw a significantly higher proportion of families sharing information about developmental milestones and interests with teachers. This change was put down to the greater visual appeal, teachers talking to each family with suggestions of what could be included and teachers personalising questions to provoke responses. Over the course of the project, parents' interest increased and families became more creative, adding photographs to their 'parent voice' sheets before emailing them back to the centre. Teachers and families became more confident in their own use of ICT.

Eastbourne Barnados Early Learning Centre

From Little Things, Big Things Grow

Puzzle of practice

How can we use ICT to build an inclusive community of learners, enhance teaching practices, reflect on our own learning and work more collaboratively with children and their whānau?

What was investigated?

Children were introduced to a range of ICTs including computers, cameras, digital microscope and software, such as Artrage, Comic Life and Kid Pix. The teachers observed how the children used the ICTs and analysed the data in relation to furthering children's interest through the use of ICT, developing teacher confidence and abilities with ICT and improving the quality of documentation and communication.

Conclusions

Using ICTs has allowed children to contribute to their own learning stories and have input into the direction of their learning. Children supported and tutored other children with using ICT tools, such as the digital camera and shared their interests between home and centre with their friends and family. ICTs have also allowed children to revisit their learning.

The relationship between the teacher and child is more equal and the teachers now often step back to allow the child to share their opinions and interests. Increasing teacher's ICT abilities in little steps has been important to the integration of ICT in the programme for children.

Favona Kindergarten

Oral language strengthened through the use of ICT

Puzzle of practice

Oral literacy is an important area of learning for Favona Kindergarten. The majority of the community of young learners and their families come from non-English speaking backgrounds and therefore English is an additional language. 'In achieving literacy, young children need writing to help them to learn about reading, they need reading to help them learn about writing, and they need oral language to help them learn about both.' (Roskos, Tabors & Lenhart 2009 p3). How can early childhood educators encourage children to further extend their use of oral language through using ICT?

What was investigated?

Surveys were sent home to the parents to find out about their home access to ICTs. Children with varying linguistic skills and abilities using ICTs created digital stories using Kid Pix and Comic Life software. The software allowed the children to add images, text, audio and video to create their stories.

Conclusions

Creating digital stories enhanced and deepened children's storytelling and teachers saw a range of improved learning opportunities including increased vocabulary, expression through story and visual art, documenting interests and making connections with the wider world. The recording of the voice on the digital story was also a helpful tool for teachers as it enabled them to document speech language delay that could be used when making referrals to speech therapists. The creation of these stories also enabled children who were confident using the software to develop leadership skills by tutoring and supporting other children.

Fiordland Kindergarten

Using ICT to Form a Learning Community

Puzzle of practice

Being in an isolated rural community predominantly involved in tourism, conservation, agriculture and fishing meant that our children had many unique experiences to share with others. We wanted to see how we could connect our children, families and communities to the outside world and we wanted the children involved as much as possible in the process. We wanted to find out if we could make connections using ICT tools to share and gain knowledge.

What was investigated?

We trialled the use of email, Skype, and blogging as a means of forging connections with the world beyond the centre. The data was analysed in relation to the four main components of forming a learning community: developing relationships, making some of the work public, making connections between the early childhood setting and home and making connections between the learning community and the world in meaningful ways.

Conclusions

In an isolated community ICT tools can be used to sustain relationships and extend learning opportunities, children can share information to an outside audience and see themselves as teachers as well as learners. The blog supports connections between the learning community and the world in meaningful ways and because it is worldwide it makes the children's work public. Skype has allowed interactions with other kindergartens and has also created links between the centre and the children's family. Over time these ICTs have become part of the kindergarten culture, and are often used together to further build the learning community.

Geraldine Kindergarten

Gael, I'm a Perseverer, Sarah's Not, She's a Risk Taker!

Puzzle of practice

The teaching team reflected on their current assessment practices and found that they didn't truly listen to children's voices when planning. They also realised that although children were generally confident to share their ideas it was at a surface level only. They wanted to build complexity into children's thinking, encourage contribution and allow children to lead their own learning. The particular area of focus that they wanted to develop was allowing the child's voice to be more visible. How can we support children to think about their thinking in relation to self-assessment in an ICT related context?

What was investigated?

Through the local high school, the centre was introduced to the 16 Habits of Mind framework (Costa 2000) ICTs (such as digital cameras, educational computer games and Skype) were used to encourage and support children's metacognition. Children learnt to discuss and question their own progress in relation to particular Habits of Mind. There was no specific time period, number of children or specific ICT tools used, it was the shift in pedagogy and how the children used the ICT tools to remain engaged so that conversations developed that was the focus of the research.

Conclusions

Skyping was a tool that encouraged collaboration and allowed children to articulate their ideas confidently and gave assurance to children who were more comfortable to share their ideas with a screen in front of them rather than face-to-face. The ICT tools also allowed children to share their thinking and individuals felt confident to share their ideas and to respond to questions from the teachers in a creative and confident manner. The children were keen to take photographs of times when learning had taken place so that they could share their learning with their peers, family and whānau.

Grasslands Kindergarten

Parent Engagement Through ICT

Puzzle of practice

Engagement of families in children's learning and development is critical to life long learning. The challenge was to find a tool that was efficient, effective, user friendly in order to engage parents, extended whānau and the wider community in children's learning and development.

What was investigated?

Twelve children and their parents/whānau were selected randomly to participate in the research project. Each of the children were involved in the construction of their own individual blog (e-portfolio) that they and their family/whānau could access to add information, such as comments, pictures, stories and videos. Six of the parents involved were given one-to-one tuition on using the blogging website and were issued with a blogging booklet for support. The remaining six parents were only issued with a blogging booklet.

Conclusions

Creating individual e-portfolios for each child enables parents to contribute to their children's learning and allows them to share information from home. This strengthens partnerships between the child, parents/whānau and teachers. To get the most out of this, the parents need to be supported and have an understanding of how this benefits their child. The children have also benefitted from blogging as they are able to share their documented learning journeys with their peers, in small groups, with their teachers, with their parents and with the wider community, resulting in a more collaborative learning environment and strengthening the relationship between the children's home and the kindergarten.

Greenhithe Kindergarten

I Typed Out My Story All By Myself. Aren't I Clever?

Puzzle of practice

To integrate ICT the teachers wanted the children to understand the purpose of the technology. They wanted to develop the children's competency and confidence with ICT so children could use these tools to assist them in their own learning and research. ICT could then enable the children to contribute to their own self-assessment and goal setting for future learning outcomes. How can children contribute to the assessment of their learning through ICT?

What was investigated?

The teachers introduced digital microscopes and programmes such as iMovie, Comic Life and I Can Animate. They used a range of self-assessment indicators based on Book 4 of Kei Tua o Te Pae and looked at the ways in which various ICTs contributed to or made visible these indicators. Data was taken from observations, children's voice, parent/whānau voice, teacher voice and the children's work. Two children with existing high levels of skills in particular ICTs were selected as detailed case studies

Conclusions

As ICT was integrated into the kindergarten curriculum, children became engaged and active participants, using ICT tools to enhance their learning. As children's confidence grew, ICT s, in particular Comic Life software, allowed the children to display their learning and assess their future goals for learning. Comic Life stories gave value to the learning and opportunities to self-assess and to set new goals. Teachers noticed as the children's confidence grew, their use of ICT media became more complex and they showed understanding of the purpose of technology. The role of teachers shifted to one of facilitator as competence of children was recognised.

Greenwood Kindergarten

Let's Grow Together

Puzzle of practice

There had been a developing focus on ICT within the kindergarten before this programme, due to the interest and skills of the head teacher in this area. Exploratory work making movies of important events within the centre programme led the teaching team to consider the possible benefits of ICT to encourage community involvement within the kindergarten.

What was investigated?

A kindergarten blog was set up that allowed the children to share examples of their learning including voice samples, photographs, audio clips, video images of children's work and play. Surveys were used on three occasions to gather data from families about where they gain information from in order to find out about their child's learning and progression at the kindergarten. The first survey (a paper survey) was issued before the blog went live, the second and third survey (both online surveys) were completed some months later in sequence.

Conclusions

Throughout the project parents relied on various methods to gain information about their child's learning, including profile books, contact with the teacher and directly from their child. The blog became another means for children, whānau and teachers to access and share information about the children's learning and development. Use increased over the course of the research. Through the project, teachers saw the benefits of giving over control of the equipment to the children, prompted by reflection and observation.

Halfway Bush Kindergarten

Children Capturing Their World Through Digital Photography

Puzzle of practice

Teachers were using a digital camera and the children were viewing the images but were not experiencing the process of taking the photographs. We wanted all children to use ICT and wondered if this would be feasible in a mixed aged setting with children 2-5years.

What was investigated?

We made the digital cameras more accessible to all children and introduced strategies that supported the safe use of the camera. Later on we encouraged children to discuss their images and the works of known photographers as a step towards evaluating what makes a 'good' photograph. We instigated environmental and teaching changes and gathered qualitative data in the form of photographs, video, narratives and children's thoughts and ideas. This was later analysed by the team.

Conclusions

Teacher's found that having lanyards on the cameras, hooks at children's level and teaching children to use the camera and the functions of the camera supported all children using the camera. Giving children independent access to the camera empowered them to take control of their own learning. Teachers began to work at the child's pace and not the teacher's expectations of that pace. The children were able to take photographs of their interests and share them with their peers. As children became more confident using the cameras they supported and tutored other children. Children took the cameras home and brought the images into kindergarten to share with the other children. The team reflected upon teacher expectations and child expectations of what a "good" photo was. Photo galleries and discussing what they liked or didn't in photographs supported children evaluating their photographs.

Jonathan Rhodes Kindergarten

Multiple Perspectives on Problem Solving

Puzzle of practice

Problem solving is a key attribute of a 21st century learner. The centre wanted to learn more about how children were problem solving and in what situations they were encountering problems. They also wanted to find out if video made problem solving visible to parents and children. Would using video to capture children's daily work capture new information about children's problem solving?

What was investigated?

10 children were selected at random and videoed while involved in learning through play. Teachers viewed the video collaboratively looking at what problem solving was occurring. One teacher then viewed the video with the child giving them the opportunity to revisit the experience and record their reflections. Parents were then asked to view the video with their child and were asked to comment on their child's problem solving. Teachers analysed the data in terms of the visibility of problem solving using video as the capturing tool.

Conclusions

Filming children made problem solving visible for teachers but not for parents or children. The video allowed for accurate and collaborative revisits for teachers to pick up on problem solving that might not have been seen in the teachable moment. The video captured the child's voice and demonstrated their authentic intention. This was particularly true of social problem solving strategies and strategies used by children with English as an additional language. Videos were shared with parents and were also an excellent tool for teachers' own reflective practice, allowing them to develop and improve their teaching strategies to support problem solving in the programme.

Kew Kindergarten

The Ripple Effect

Puzzle of practice

We noticed that a number of our children had some difficulties with speech and language. Language gives us a way of reflecting on our thinking and talking about our ideas gives us greater control over our thinking. As teachers we need to have as many strategies as possible to support children to develop communication skills. Maybe technology is one of those strategies. This led us to ask, how can we increase and enrich children's oral language through the use of technology?

What was investigated?

Initially we trialled an interactive white board so that large-scale pictures could be shown to children to encourage discussion, however, problems with light and position meant that it was not successful. We then introduced the children to Photostory 3 and involved them in creating stories and recording their voice for slideshows however, the children found the microphone intimidating and conversation was inhibited. We then introduced the digital microscope to the children so that they could research and find out about things that interested them in order to create new language opportunities. We also created a centre blog to display children's learning and enhance relationships with centre families.

Conclusions

The digital microscope was an effective tool that increased children's observational skills and helped them to develop visual, mathematical and descriptive language. The centre blog informed parents and whānau about their child's learning and pictures allowed parents to sustain conversations about learning with their child at home. Videoing interactions between teachers and children highlighted that too many questions were off putting for children. As a result, teachers used more prompts and allowed children more time to think about what they are saying to develop their oral language.

Kids at Play Childcare Centre

Making Learning Visible

Puzzle of Practice

How can we deepen our knowledge of the components of children's learning, dispositions, skills and knowledge and how can ICT support this learning and make it visible for parents/whānau and the wider community?

What was investigated?

The centre used email to send newsletters, set up wall displays of children's experiences (emergent curriculum) and increased the visual component in learning stories. Drawing on evidence from these and also a survey of parents' feedback, they identified ways in which ICT helped to inform parents of their children's learning by focusing on communication, contribution and collaboration.

Conclusions

The sending of newsletters via email to parents was successful and offered opportunities for communication between the centre and parents and also opened the door for contribution and collaboration as parents often responded to the email newsletters with requests and ideas that enabled them to be further involved with their child's learning.

The wall displays were regarded as important for the children's learning by the parents and helpful for demonstrating what their child had learned. The display allowed parents to contribute to 'sharing time' with the child and allowed for collaboration about the displays that were exhibited.

Home contact books allow children to store and revisit their work and create dialogue between parents and children. The book communicates to parents their child's participation in the programme and the parents are invited to contribute to the books at any time. This also allows for

collaboration with the parents, as children can take the camera to their families and bring the images back to the centre to show to the other children.

Kids Domain Early Learning Centre

Troubling Teacher Identity

Puzzle of practice

How do children and adults understand themselves and how can collective storytelling using ICT be used to support this so that lived experiences might inform teachers' work with children and their whānau in the future?

What was investigated?

Teachers investigated digital story telling using the downloadable software programme Photostory 3. The teachers first made and presented their own individual stories. This enabled them to learn how to use the ICTs and to discover more about their colleagues. Following on from this teachers introduced Photo Story 3 to children who then independently created their own stories to take home on DVD. A workshop was held for parents where the children's digital stories were presented and the parents were invited to create their own stories also. Data indicating the impact of these digital stories were gathered using video, reflective journals, blogs, emails and records of group discussions and team meetings.

Conclusions

Sharing stories about lived childhood experiences has resulted in a shift in thinking and practice for teachers that in turn have resulted in more positive learning outcomes for children. Equipment has become more accessible and children now make their own decisions about how, what and when they use ICTs. The sense of trust that the teachers now have in the children has allowed for a more collaborative approach between teachers and children when planning for learning and development. The parent/whānau workshop on digital story telling has increased the ways in which the families are communicating with the centre and contributing to their children's stories.

KIDSPACE Quality Early Education Centre

From Fear to Nearly There

Puzzle of practice

Baseline data collected at the beginning of ECE ICT PL showed that meaningful conversations with whānau were happening regularly. However, we wanted to deepen teacher – whānau interactions and research other avenues where extended family and whānau could gain knowledge about their child's learning and development. We asked what impact would developing a KIDSPACE blog have on enhancing our partnership with whānau?

What was investigated?

We built our blogging capacity by starting with a teacher only blog. Finding that manageable, we consulted families and as a result created a whānau blog that records events happening at the centre as well as more general information. The effectiveness of this was measured against a set of indicators. Data was gathered from surveys and questionnaires to teachers and whānau both before and after the set up of a centre blog. Informal conversations with whānau were also logged and later used in the analysis.

Conclusions

The blog has begun to open up communication between the centre and home and allowed whānau to share experiences that their child was having at home, facilitating the teachers to plan accordingly for the child's interests. Children were also accessing the blog from home and their whānau felt that this experience connected them with their children's learning experiences, as they were able to talk about what had happened that day. The blog was a particularly useful tool for whānau who were unable to visit the centre as it created a platform that gave them an insight into their child's learning and progress. Teachers' skill in responding to learning, particularly group

learning, is showing greater focus and continuity as a result of the access to activities highlighted on the blog.

Kidzfirst Children's Hospital: Medical Care Unit

Supporting Children's and Families' Learning in Hospital Through ICT

Puzzle of practice

Kidzfirst Children's Hospital: Medical Care Unit provides hospital based early childhood services for young children who have chronic or life limiting illnesses, respiratory illness, and renal and skin conditions. A philosophy of family-centred care is an essential principle of service delivery. Though observation educators had identified that ICT (video games) was a tool that engaged families with their children while at the unit. We wanted to further explore how ICT could be utilised to support children and families' learning in hospital.

What was investigated?

A DVD was created to support the transition for parents and their child leaving the neonatal unit. Parents were asked for feedback reflecting on the informative value of the DVD prior to leaving hospital. In addition, PhotoStory3 software was used to create a resource showing the environment and equipment that children could expect to experience while in hospital. Children and families were given access to this through a computer in the designated activity room. The team recorded how the ICT equipment was utilised by staff, children and their families. Educators monitored their own confidence in using ICT.

Conclusions

The results of the analysis indicate that ICT is a tool that has significant potential to be a communication resource for children, families and staff in hospital. There is also further potential for ICT tools to assist children to construct strategies to manage events in hospital and recognise their own strengths. ICTs in the hospital strengthened communications between children and their families through creating digital stories and memory books that allowed the children to share their experiences with their family. The transition DVD, accompanied by a transition visit helped parents prepare for procedures that their child may have to undergo in future.

Kidzfirst Kindergarten (Riccarton)

Making Learning Through Play Visible

Puzzle of practice

When a family transitions into kindergarten, much of the focus is on completing management bureaucracy, sharing the child's learning through play was often overlooked. We realised that the possibilities to share the children's learning using ICTs was accessible and the learning stories and profile books were an appropriate part of the children's learning to celebrate through sharing with the family and whānau.

What was investigated?

There were two research components to this project, firstly, the centre created a short DVD that informed parents of the learning that takes place in the kindergarten and this also helped them to understand the learning that is demonstrated in the children's profile books. Six families were given a copy of the DVD and a questionnaire to complete. The completed questionnaires were returned and the data was divided into four areas, play, skills developed, curriculum/context and transitions. The second element of research involved creating a photo story of a child participating in learning at the centre, the story was copied onto a DVD and given to six parents along with a questionnaire and the results were collated into four key areas, play, parents linking play and learning, impact of the photo story for the child and transition.

Conclusions

The DVDs were an excellent tool that allowed families to have a greater understanding of how important play is in the early years and enabled them to see how their child learns whilst at

kindergarten. Parent's feedback indicated that they could see how their child develops key skills through play and that this is an effective method of learning.

Kidsfirst Kindergarten (Trengrove)

Nothing Short of Amazing

Puzzle of practice

Recent changes in early childhood education opportunities and the growth in ECE facilities available have provided a wider range of choice for families. The consequence of this is that there are fewer children on the waiting list and the trend to enrol children at a younger starting age has become firmly established. In what ways can the use of ICT be extended to facilitate the transition into kindergarten?

What was investigated?

The project was organized into two phases; the first involved a group of six children and their parents who together wrote a welcome story including photographs and narrative using the voice of the parents. Each of the children took their welcome story home and shared it with their family and whānau. The second phase of the project involved issuing another group of six children and their parents with a digital camera to take home so that they could take photographs of people, places and objects that were significant to the child. On return to kindergarten the teacher helped the children to access their photographs and create slideshows that the children were able to look at. The parents of both groups of children completed questionnaires to determine how successful these activities were in helping to contribute to a positive transition into kindergarten.

Conclusions

The results of this research indicated that ICT is not only a powerful tool that supports children's learning but can also contribute positively to a child's transition into kindergarten and is indicated in the outcomes below:

- ICT was particularly helpful for children who had initial difficulties settling. For children who were confident from the start it had little impact.
- Children who were reliant on non-verbal communication because they were not confident speakers of English benefited from having photos of familiar artifacts of importance to them.
- Closer connections that developed between the teachers and families during this process assisted the teachers to gain cultural awareness and build meaningful relationships with children.
- Use of ICT reassured parents that their child was settled and enjoying kindergarten.
- Teachers had an opportunity through the photos to become more familiar with the child and their family interests. This opened the door for lots of in-depth communication and getting to know them on a level that may never have otherwise been achieved.

Kiwicare Preschool

Strengthening links between home and centre using ICT

Puzzle of practice

Due to the multicultural community in the local area, many of the families are from non-English speaking backgrounds. At times it is challenging to exchange information with parents. How can using ICT tools help us to forge better communication between home and centre?

What was investigated?

A combination of methods were used, such as case studies, questionnaires, surveys, interviews, and formal & informal observations, as we investigated different ways of using ICT to reduce barriers in communication between the centre and families. Service trials included putting slideshows on the proACTIV board for children and parents to view and sending pictures home on

CD, DVD and by email where parents had difficulty in understanding the learning stories in written portfolios. Photo stories were also created in the mother tongue for some individual children.

Conclusions

The creation of photo stories helped to boost the self-confidence and self-esteem of the children and the ability to share their photo stories with their parents encouraged them to download the software at home to create photo stories that they could bring to the centre to show other children. This project resulted in some parents actively participating and contributing to the programme, working alongside the teachers to build the links between the centre and home to enhance the children's learning.

Lucknow Kindergarten

A Journey to Authentic Assessment

Puzzle of practice

We became aware that children were seeking to increase their participation in the use of technology. Teachers recognised that previous ICT initiatives involving making digital stories had been initiated and developed largely by teachers. Therefore we wanted to find out what the learning outcomes were when children set their own challenges in documenting the learning using ICT.

What was investigated?

Having increased the ICT equipment available, and observed an increase in numbers of children using ICTs, the teachers decided on a number of areas (indicators) where they thought the addition of ICT used by the children might enhance the experience. They analysed learning stories for examples from each of the areas (indicators) to see if ICTs fostered particular indicators and which ICTs were used most frequently.

Conclusions

Children developed new understandings, skills and became confident to experiment with technology in order to gain their desired results. The more confident children were able to demonstrate leadership skills by tutoring and supporting less confident children. Children became self-assessors of their learning through revisiting what they had documented using ICT They were able to make decisions of what counted as valuable learning as well as having the ability set their own goals and choose what learning was recorded. While ICTs facilitated revisiting, the role of the teachers promoting such opportunities remained significant also.

Manaia Kindergarten

The Blogging Ripple: Here's My Blog Address, You'll Be Needing This!

Puzzle of practice

ICT is transforming our daily lives and the way that we learn and technology can be used as a method for communicating and sharing ideas. How can we use ICT tools to further facilitate a community of learners and how will this benefit the children and their families? This led us to our research question: How can blogging at Manaia Kindergarten foster closer relationships with various groups within our learning community, and how will this benefit our community of children and their families.

What was investigated?

Initial data collection concentrated on the use of ICTs in the home environment and parents' beliefs about the use of ICT in education. A kindergarten blog was set up that the children, teachers and parents could regularly contribute to. Regular workshops for parents were provided and feedback in the form of surveys and discussions was collected. The analysis of the qualitative data involved creating common indicators that provided evidence for the research.

Conclusions

The blog has become a point of connection between the kindergarten, families, local schools and other early childhood centres both nationally and internationally. This network of blogging relationships continues to enhance and stimulate professional thinking. Children now consider the blog as a natural tool to communicate with the wider world and it is embedded into their thinking along with the digital storytelling that goes with it. The children feel that their learning is valued because they can send home their learning progress to share with others. Parents use the blog as a tool to connect with their children's educational experiences and are able to collaborate by adding comments about their children's work.

Maraeroa Kindergarten

Bringing down the fences: Strengthening and enhancing community.

Puzzle of practice

Rich learning occurs when children are deeply absorbed and involved in play. The immediacy and shared language of visual images is very powerful and offers teachers, children and parents an alternative method of communication. How can digital cameras help us as a community of children, parents, whānau and teachers to strengthen and enhance continuity, community and competence?

What was investigated?

This was an exploratory study that examined the nature of children's experiences with digital cameras and also how this impacted on relationships between the centre and families. Individual children were given cameras to take home or for special events. Data was collected from individual case studies which highlighted different ways cameras could be used effectively.

Conclusions

Digital cameras were significantly motivating for the development of children's social skills. They facilitated collaborative interaction and allowed children to extend one another's skills through peer tutoring. Allowing the children to take the camera home assisted in times of transition as children could carry photographs of their home around with them bridging the gap between the familiar and unfamiliar. This practice also helped show that kindergarten is interested in and committed to valuing and respecting children's home life and the contribution this makes to children's well-being. By extending the use of cameras to children they are empowered to see themselves as competent users of valuable equipment who can be trusted to explore the opportunities available to them with the technology.

Massey Childcare Centre

Using Digital Video to Enhance and Refine Pedagogy

Puzzle of practice

Reflective practice is essential to quality teaching. It is through reflecting that teachers can enhance and refine their teaching pedagogy as it not only provides opportunity to challenge teaching strategies, but also allows teachers to consider how their practice corresponds with their philosophy. How can using ICTs further enhance reflective practice?

What was investigated?

The teaching team used the video function on still cameras to video themselves interacting with a child or group of children and later privately viewed the footage and wrote a personal reflection before sharing that reflection with a colleague. The data gained was then analysed for emerging patterns in teachers' interactions.

Conclusions

The use of video enabled teachers to reflect on their practice in an alternative way and offered the option of viewing their practice several times, presenting the opportunity to reflect on their practice from different perspectives. Teachers' subject knowledge has been further developed and

strengthened as teachers could view how they were using appropriate terminology with the children. Viewing themselves on video allowed teachers to witness that some of their interactions with children were teacher led and they often did not give children enough response time to questions. Using video as a reflective tool has allowed teachers to shift these practices. Teachers reflecting on their own video footage enabled them to engage in a deeper level of critical reflection and they have become more aware of their pedagogy. The videoing encouraged teachers' engagement in professional dialogue with their colleagues and affirmed practice.

Mayfield Kindergarten

Making Movies – Creating Communities

Puzzle of practice

Many families did not have as high a level of involvement in the kindergarten as we would have liked. Parents were not staying on during the session, and there was limited feedback from parents in their children's profile books or verbally after learning stories had gone home. We wanted our families to feel a sense of belonging and we wanted to know how they were feeling about their child's learning because participation is an important feature of kindergarten life. Prior to joining the ECE ICT PL project, we had on occasion made group videos of children's play and felt this may be a vehicle to encourage dialogue. We asked, in what ways will using movies of children's learning episodes strengthen families' relationships with the kindergarten, encourage participation and enhance parent's understanding of their child's learning?

What was investigated?
A group of 6 children who had just started kindergarten were selected and individual movies made up of images and video clips of their learning was created. The photographs and video were sequenced together with titles, transitions and short pieces of text and burned onto a DVD, which was inserted into the back of the child's profile book and sent home with a written narrative and feedback form for the parents. The feedback from parents was analysed and a follow-up interview with a selection of parents was carried out to establish whether the increase in comments we were experiencing was directly related to the making of movies.

Conclusions
There was a significant increase in parent's verbal and written feedback compared to what was happening when we only sent written learning stories home. It was clear from the amount of feedback that making movies was effective in increasing communication, indicating that movies were strengthening relationships with parents. The parents' excitement when they shared how they felt about the movie prompted more discussion particularly about learning. Having these conversations about children's learning has enabled teachers to build relationships with parents quicker than in the past.

Meadowood Community Crèche

PossAbilITies

Puzzle of practice

The centre makes a point of valuing diversity. Our core values were identified as respect, value for individual differences, relationships, fairness and social justice. Influenced by the municipal schools in Reggio Emilia and Carlina Rinaldi with their focus on the child as 'possessor and constructor of rights' we wanted to find ways that we could better support children with special rights through the use of ICT. We wondered if enabling children's experiences to be video-taped and shared with the child, their families and those directly involved with their individual plan would help strengthen understandings and relationships.

What was investigated?

The first created a chronological record of learning (digital diaries) on disc for children with identified learning differences. Later they moved to individual, private blogs. The practice was trialled using case studies of five children. Digital diaries contained photos, video and audio often made using PhotoStory 3 software. Evidence of the effectiveness of these was collected through a

parent/whānau survey, teachers' reflections, parent/whānau verbal and online comments and comments from key support people.

Conclusions

Video proved to be effective in capturing children's achievements and thereby providing a platform for sharing knowledge and interpretation. Blogs enabled parents' easy and immediate access to children's documented experiences. Parents using blogs took responsibility for adding material, making the partnership between centre and families stronger. Giving key support professionals access to digital diaries and blogs enabled dialogue, advice and goal setting to be an ongoing process rather than confined to IP meetings.

Mosgiel Central Kindergarten

A Journey in Supporting Learners to be Confident and Competent 'Online' Digital Citizens

Puzzle of practice

Our curiosities centred around children's thinking and in particular how to deepen thinking. We started with the belief that, for deep learning to occur, teachers needed to move from the traditional view of leading learning themselves to one where children take the lead in their learning. The addition of wireless Internet encouraged us to ask, In what ways can we use online tools to support children's deep learning?

What was investigated?
Online gaming became the focus of our investigation. Children were able to access four online games intended for their age group. Teachers first ensured that cybersafety precautions were taken and then worked alongside children as they played the games. Data was gathered from children's learning stories and documentation was collected from 23 children who used Google toolbar, Google search engine and gaming. Teachers analysed the data looking for indicators of deep learning using Andrew Churches' revised version of Bloom's Taxonomy as a framework.

Conclusions
The online tools empowered children to take the lead in their own learning and supported literacy and numeracy understandings, collaborative relationships between children with their peers and teachers. Online games engaged, motivated and stimulated children whilst also offering them the opportunity to be leaders or experts. The teachers' presence was vitally important as they could make comments, ask questions, point out things, role model and observe.

Nayland Kindergarten

Activity to Engagement: A Visual Art Journey Through an ICT Lens

Puzzle of practice

How can we ensure that children develop the learning and life skills that they need to be self-motivated learners from kindergarten onwards in the 21st century? In a world that is constantly changing creativity and critical thinking have become learning priorities. Literature shows that new technologies have great potential for fostering creative activity. The teachers identified a 'gap' in engagement in the visual arts. This led to the question, how can ICT scaffold children's creativity in the visual arts?

What was investigated?

Teachers rethought their pedagogy around visual arts based on feedback from outsiders, professional readings and discussions (both online and face-to-face), As they undertook deeper investigations within the visual arts arena with children, ICTs (cameras, video, the Internet, slideshows) were used as provocation and to record processes and events and collaborative teacher reflections. The teachers gathered data through surveys, teachers' reflections and case studies of individual children.

Conclusions

Teachers found that taking a more co-constructive approach did not stifle creativity, on the contrary it provided a platform from which to develop depth and complexity in children's learning. Children engaged in more complex art processes over time and many took on the role of a teacher, assisting other children and teachers with creative processes. While the increased complexity could largely be attributed to a change in teachers' beliefs about their role, ICT played a part also. It enabled children to record, revisit, inspire others and transform their art for other purposes such as story telling.

Next Generation Childcare

Riding the ICT Rollercoaster

Puzzle of practice

Although children's learning stories were available, the children's families were not independently accessing them. This led to the question, how can we strengthen levels of reciprocal communication and relationships in our centre for children, whānau, teachers and the wider community through the use of ICT? Would emailing learning stories to parents allow families to contribute to their child's portfolio, communicate with their children and teachers and provide a deeper understanding of their child's learning and development?

What was investigated?

The teachers began by trialling email. Over an eight-week period learning stories were emailed to families, who were encouraged to engage in communication about their child's learning. When this was found to be difficult to manage, parents were surveyed and as a result it was decided to trial online portfolios for each child. Teachers then created a centre blog with private online portfolios (e-portfolios) to upload children's learning stories, photos, voice and video clips. Parents were invited to an evening to learn about how to use the blog.

Conclusions

Children took ownership of their online portfolios and felt empowered being able to share their learning experiences with their peers, family, whānau and the wider community. The children's families enjoy reading about their child's learning experiences and are able to interact fully with their child and their child's friends through the blog. Children, teachers and parents all contributed to the blog by uploading photos or adding comments. Using ICT for storing and sending children's learning stories to parents often elicited a more immediate response. The success of the project relied heavily on the leadership and commitment of staff to be open to new learning.

Onehunga-Cuthbert Kindergarten

ICTs: A tool for self-assessment and goal setting

Puzzle of practice

ICTs can play an important role in empowering children to become self-motivated, independent learners who can assess and extend their own learning. How can we empower children to make use of ICTs as a tool in self-assessment and goal setting? Can we develop strategies that will enable children to safely use the Internet as an educational resource?

What was investigated?

Teachers experimented with creative software (e.g. Kid Pix) that children could use to document their learning and with hardware such as laptops, digital microscopes, cameras and keyboards. They trialled new technologies to further involve families in the learning processes and used the Internet for research with children. An holistic approach to data gathering was taken which included maintaining a learning log, writing reflective journal entries, creating CDs and DVDs that documented children's learning. Questionnaires and surveys were issued to families. The data analysis involved looking at all the evidence collected from these sources for key indicators of empowerment, self-assessment and goal setting.

Conclusions

Using ICT to create and share stories, and to access information has empowered children to become independent learners who are able to reflect and set goals. It also provided opportunities for some children to take on leadership roles amongst their peers. Online resources such as Google Earth, Google Images, You Tube and Flickr brought new perspectives to many learning projects. Teachers were learning alongside the children about ICT and this strengthened the sense of empowerment felt by the children.

Otago University Fulltime Centre

Confident and Competent Children

Puzzle of practice

We wanted children to lead their own learning and self assessment. We wanted them to enquire, document and develop a love of learning through using technology. We believed that as children felt more in control of their learning they would in turn develop an increase in confidence and competence. We also wanted to continue to promote a focus on creativity. This led us to ask, in what ways can we use ICT to support children's confidence and competence through the creative arts?

What was investigated?

Teachers used a variety of ICT in the programme to support children's creativity and they supported children to use the tools themselves. This included the Internet to research children's interests, including popular culture. The children recorded stories using video, PhotoStory 3 and Kid Pix . These were then viewed by the children and in some cases families. Qualitative data was collected from video footage, narrative assessments, parent feedback and anecdotal observations and was analysed in relation to indicators of competence and confidence incorporated into Carr's Dimension of Strength and the ability of ICT to enhance further creative endeavour.

Conclusions

Through the wide range of ICT resources available to them children have developed new ways of researching and finding out about things of interest. ICT supported and enhanced children's confidence and competence in the creative arts by providing models and ideas upon which to base their own work. Open-ended software allowed children to transform photographic images and 'play' with ideas. The Internet provided a valuable means of developing shared understanding between teachers and children especially around popular culture. Through the use of video children were able to create, evaluate and revisit content.

Otatara Kindergarten

A Story of Bicultural Development in a Mainstream Kindergarten

Puzzle of practice

In 2004 we asked ourselves how we, as a predominantly 'Pakeha Kindergarten', could make a true commitment to Te Tiriti O Waitangi. As a result of this we had been strongly influenced by the work of Jenny Ritchie (2003) on whakawhānaungatanga. In particular "to build trusting relationships with whānau by communicating respect, warmth, caring and understanding" (p97). As non-Māori educators in a predominantly non-Māori community we wanted to discover how we could use ICT to strengthen our bicultural development, including te reo.

What was investigated?

Resources developed included books about the local community, a DVD about the philosophy of the centre and a public wiki that aimed to give support, advice, ideas and networking opportunities for teachers committed to bicultural development. In addition, digital books featuring the children's artwork and stories were made, along with DVDs of the children performing dramatised Māori myths. Skype was used to connect with other centres to teach and learn waiata and children watched videos of other Māori myths and legends on YouTube. Data was also gathered from surveys to whānau, learning stories and staff reflections.

Conclusions

The books became a catalyst for relationships between children, teachers and whānau. They provided a vehicle for parents and staff to share their aspirations and the learning they value for children. Evidence suggested that the DVD about the centre given to new families facilitated familiarity with the routines, expectations and general physical environment. The teachers' use of a wiki for information sharing with other teachers was less successful, attracting few responses. This may have been due to the unfamiliarity of wikis by many teachers. The recording of children performing dramatised Māori myths helped highlight how te ao Māori was enacted and valued within the programme.

Peachgrove Kindergarten

Researching the Search Engine

Puzzle of practice

ICT sits alongside and complements all other tools for teaching and learning. How can we implement ICT as a natural part of the learning programme to improve learning outcomes for children? How can the disposition of taking an interest be enhanced by using ICT?

What was investigated?

Teachers first became more familiar with how the Internet worked, ICT terms and the various search engines. They then made the use of the Internet available for children (supported by teachers) as a tool for research when interests and questions arose. Parents were asked whether or not their children used the Internet at home and one third said their children did.

Conclusions

On average the Internet was used as a tool for research four times a day over the duration of the six weeks and recording took place. However, teachers observed that children rarely initiated the use of the Internet for information, or a book for that matter. It was the teachers who did. Once they were using a search engine, children were drawn to the pictures and movies. This often resulted in attention being diverted from the original investigation to whatever was on the screen.

Pukerua Bay Kindergarten

ICT Transforms Wonder: Adding Layers of Complexity to Learning Outcomes

Puzzle of practice

We asked ourselves whether we were really catering for our learners in their 21st century context, a context that included learning through and with ICT. As a team, we were not confident with ICT. Our children had long been keen navigators of the insect world at kindergarten and we thoughts this would be an area where engagement might be strengthened through using ICT tools. We asked, how does our use of ICT as a teaching and learning tool support, extend and add complexity to our children's understandings about the natural world of flora and fauna?

What was investigated?

ICT tools such as the Internet, digital microscope, Photostory 3, e-books, cameras and video for use by children and teachers were introduced. Data was collected in the form of case studies, and evaluated against a list of signposts of complex learning behaviours.

Conclusions

ICT opens new possibilities of learning and investigation – e.g., displaying investigations using ICT encourages less dedicated naturalists. Because of the multi-faceted nature of ICT (visual, audio, written) there are many ways for children to strengthen understandings. Children develop skills such as communication, collaboration, exploration, reflection and relationship skills through opportunities provided by ICT, including peer tutoring. The ability to revisit documentation allows children time to process their observations and to be able to articulate their newly gained knowledge. Teachers are much more inclined to let children manage the process of documenting

what is important to them in their learning rather than thinking they need to control the process which leads to greater complexity. ICT is not just an adjunct, but has become part of the normal classroom resource where children can access the tools as and when they have something of interest that they wish to investigate.

Rachel Reynolds Kindergarten

I Have the Wings to Fly

Puzzle of practice

We were making a large amount of applications to Group Special Education for help with children's delayed language development. We wanted to improve our children's oral language skills, and engage parents/whānau in their children's learning. We asked how could we create an environment that promotes/fosters oral language using ICT?

What was investigated?

A range of strategies involving ICT were trialled. These included displaying photographs of family outings for children, families/whānau and teachers to talk about, creating photo stories for children to take home to share and discuss with their families/whānau, teaching children to use digital cameras to record their learning experiences, using the digital microscope and screening videos and photographs that the children have made themselves. The data was analysed looking for key indicators of improved oral language.

Conclusions

Children were confident using the digital camera independently and found being trusted with the equipment empowering, many children developed tuakana/teina relationships and this encouraged opportunities for conversation. Creating photo stories gave some children the opportunity to create something that they were proud of, that they were able to share with their peers and family and to have extended conversations about their learning. The display of photographs on the wall was a strategy that worked well for fostering conversation and children and their parents spent a lot of time looking at and talking about the images. No single ICT stood out as promoting oral language better than the others. Success depended more on children's interest in using the tools and teachers' quality of interaction. Videos challenged teachers' assumptions of children's language made teachers aware of strategies that either fostered or stifled interactions.

Rangitoto Kindergarten

ICT – From Fact to Fiction

Puzzle of practice

We believed that meaningful learning occurs, when contexts allow children's curiosities, interests and inquiries to evolve. Therefore, how could we use ICTs to further enhance and harness children's excitement for learning through investigation and exploration? How could we use ICTs to increase children's 'voice' within the programme?

What was investigated?

Children were introduced to the digital cameras and were given the opportunity to experiment with taking photographs. Six children, who showed a keen interest in ICT, were selected and explored the use of the digital camera with Kid Pix software. Once children were demonstrating a confident grasp of using the digital cameras, they were introduced to Comic Life as a means of combining their new skills with a simple format for documenting their experiences. Over time the children were also introduced to the digital microscope and the Internet and were encouraged to use the tools to enhance their learning and curiosity.

Conclusions

Each child connects with ICT in their own personal way, for some it inspires art, music, drama, while for others it supports investigating nature and facts about the world. The Internet encourages

children to search for answers to questions, wonder at the natural world, make discoveries and develop theories. The digital camera provides children with a voice to share and reflect about their interests, perspectives and achievements. Using ICT tools can provide a strong social context. Children work alongside each other supporting and tutoring one another. Creating DVDs of children's experiences has helped to forge strong links with families and they have a greater insight into their children's experiences of learning. It has also given shy or unsettled children a means of gaining confidence within the centre

Riversdale Kindergarten

Can You Hear Me? How We Listened to Our Children's Voices

Puzzle of practice

Learning stories were the primary form of assessment and were mainly written from the teacher's perspective. On some occasions the child's perspective of their learning was visible but critical reflection of the assessment process showed that the real essence of children's thinking was missing. How could we better highlight children's thinking through the use of ICT?

What was investigated?

The team used software programmes such as PowerPoint and PhotoStory3 to create e-books with the children, incorporating the children's photographs and stories. Data was gathered by reading the e-books to the children and any comments they made were recorded and analysed against a set of indicators showing children's thinking.

Conclusions

The children have used their e-books to show that they are able to consider the reader and create an appropriate story for them. The e-books also enhanced the children's vocabulary as they expressed a variety of tenses and descriptive words that were not used in everyday speech. The children were able to revisit their e-book at the centre allowing them to make improvements to their stories, and they were also able to print out their e-books to take home and share them with their families. Seeing children's competence has led teachers to reassess their practice and become more inclusive of children's interests and discoveries.

Rotorua Girls' High School Childcare Trust

E-Portfolios as an Effective Communication Tool in Early Childhood Education

Puzzle of practice

The centre's strategic plan highlighted the integration of ICT as a focus for pursuing further complexities of learning and assessment for children. The philosophy of the centre, based on whakawhaungatanga, emphasised the importance of relationships and connections to children's growing sense of identity. How can the communication between children, parents, whānau, teachers and the wider community be enhanced using ICT?

What was investigated?

Individual e-portfolios were created for seven 'case-study' children to keep a record of their learning and to enable them to share their progress with their family, using a blogging platform. Family and whānau were granted access to the blog and were invited to contribute to their child's e-portfolio by adding photos, videos and comments. Once the teachers were satisfied that the process was sustainable, e-portfolios were made available to all families who wanted them.

Conclusions

The blog further enhanced reciprocal relationships and communication with centre families and children, parents, whānau and teachers regularly contributed to the children's blogs. Parents are able to post stories of events that have happened outside of the centre giving the teachers a deeper understanding of each child. The parents can see what their child has been learning at the centre and can encourage and enhance this learning at home. The children have a clear

understanding of the purpose of the blog and request to include their learning stories, videos and pictures and text so that they can share their progress.

Rototuna Early Education Centre

Bringing the Digital World into Early Childhood Education Through Photo Story 3

Puzzle of practice

Teachers were aware of the importance ICT plays in the lives of children and their families and whānau. They believed that as teachers they had a responsibility to help develop children's levels of confidence in using ICT equipment. It was important to integrate ICT into children's experiences in ways that would enhance their learning. We acknowledged the importance digital documentation has in the lives of children growing up in today's society. In what ways could this be practiced in our centre?

What was investigated?

PhotoStory 3 was the software used. Digital stories of the children's learning interests were developed for the infant and toddlers group, and the kindergarten group. These were replayed at the centre (sometimes projected on a big screen) and sent home for parents to view with their child. A questionnaire was developed to gain feedback about how their child had responded to the photo story. The contribution of the stories to children's learning was highlighted through sets of indicators – different for older and younger age groups.

Conclusions

The implementation of PhotoStory3 into the programme allowed children to develop their own working theories about how they could use the technology when given the time to explore and problem solve. Children displayed how capable and competent they are in using technology as a tool to share their stories with an audience, whilst undertaking multiple roles of publishers, authors and illustrators. Children learnt to think about their thinking and to create. The stories helped to strengthen oral language and could be used as a means to assess language and learning.

Sunshine Kindergarten

ICT- Helping Bridge the Gap

Puzzle of practice

Families with English as an additional language make up nearly half of the families in our centre. Developing relationships with these families can be prolonged and fraught with misunderstandings due to language difficulties. An initial survey showed that the number of these families who contributed to their children's profile books was significantly lower than for other families. This led to our question, how could we support ESOL families' participation through the use of ICT?

What was investigated?

The team created two versions of an orientation DVD using Photostory3, one in English and a second in Mandarin which were made available through the kindergarten information pack and at the local Citizens Advice Bureau. Families viewed the DVD and were then asked to complete a questionnaire about how effective the DVD was. Children also created their own stories using Photostory3 and took these home to share with their families.

Conclusions

ICT helped to bridge the language gap, hastened relationships and increased participation. ESOL children were given a powerful voice and an opportunity to revisit their learning and celebrate it with their families at home. Parents contributed to their children's stories and sent the electronic documents to the wider family elsewhere in the world. Some parents shared their cultural and historical family stories with teachers, to enable their children to create photo stories about their heritage. Some families downloaded Photostory 3 at home and began to create their own stories.

Takapuna Kindergarten

Creating Digital Leaders: Do I just Push the Big Silver Button?

Puzzle of practice

Teachers wondered how integrating ICTs into the curriculum would engage children and if it would appeal to their different learning styles. Would using ICT give children the opportunity to deepen their learning experiences and provide them with a medium to express themselves creatively? This led to the teachers thinking about what teaching strategies would be the most effective for the smooth integration of ICTs as 'natural tools' into the curriculum? What impact would those different strategies have on the children's learning?

What was investigated?

The six teaching strategies that teachers researched and reflected on were – the directive approach, learning alongside, dialogue, exploration, modeling and planning. Teachers observed and reflected on the various teaching strategies and gathered data from a range of sources including teacher's reflective stories and children's learning stories. Teachers used this evidence to clarify the direction for further development.

Conclusions

Teachers found that different teaching strategies worked for different children when integrating ICT, dependent on their prior knowledge. Children who were less experienced or less confident using the ICTs often sat and watched other children as they "modelled" or "learned alongside" teachers using the "directive approach". Confident children were able to "explore" and "learn alongside" others and even became the peer tutors "modelling." The growing knowledge and experience of the teachers opened up further learning opportunities for the children and the ICT tools ensured that the children remained engaged and interested throughout the experience.

Te Rau Oriwa Early Learning Centre

The Children of Today are the Leaders of Tomorrow

Puzzle of practice

We wanted to research and access age appropriate ICT resources that would benefit tamariki, kaiako and whānau through the medium of te reo Māori. Also, to build on teaching, learning and communication where the learning could be implemented at the centre and be extended within the home environment. Our goals led us to ask, how can Kid Pix be used to enhance tamariki learning of te reo and tikanga at Te Rau Oriwa Early Learning Centre?

What was investigated?

We began with a survey to determine access and use of computers in homes. Kaiako were introduced to Kid Pix which they then used with tamariki to create their pepeha, using te reo Māori as much as possible. A hui was held to inform whānau of the Kid Pix programme and the possibilities and learning outcomes that were available, particularly in the learning of te reo Māori. Qualitative data of the impact of Kid Pix was collected in the form of learning stories, teacher reflections, whānau voices and anecdotal observations.

Conclusions

ICT has provided tamariki with a positive, stimulating, active environment, which provides the opportunity for language development and learning the protocols of social interaction. An increase from one word to a simple sentence structure has been observed when tamariki use Kid Pix. However, the computer and software are merely the tools by which to capture the child's interest – the kaiako presence and interactions are the enhancing factor that determines the level and use of te reo Māori. Some children have become tohunga, sharing their expertise in using Kid Pix with their peers. The professional development brought about a significant increase in confidence with ICT amongst kaiako.

Thames Early Child Education Centre

From KFC to ICT: Our 3-Year Journey

Puzzle of practice

We felt it was important to involve the wider community, not just the parents and whānau of our centre as it places the children as valued members and contributors to their community. Therefore we asked how could ICTs be used to enhance and strengthen communication between teachers, parents, children and the wider community?

What was investigated?

A number of approaches to strengthening communication were trialled over three years. These involved the teachers, the children and their families using a variety of ICTs including digital photographs, email, online applications (Skype) and e-portfolios. This was done with three main aims, to make children's learning visible through documentation in their portfolios, sharing teaching and learning experiences through digital portfolios and sharing teaching and learning experiences through e-portfolios.

Conclusions

Children's learning became more visible, particularly to the children themselves, as documentation improved visually because of the ICT. E-portfolios were found to be a particularly effective means of children sharing their centre learning with friends and family. Feedback about learning experiences from parents and whānau occurred more regularly and became more in-depth, which added to the assessment. ICT has extended the ability to connect and establish communication lines, which in turn has supported children's learning. Parents have appreciated developing ICT capability themselves through the centre.

Tots Corner (Babies)

Enriching Pedagogical Documentation Through ICT

Puzzle of practice

For babies and toddlers who are learning to talk, the role of the teacher is to be able to listen and interpret the child's meaning in order to plan and build on their learning and to understand the child's perspective. In what ways can teachers reflect on, interpret and enrich infants and toddlers investigations using ICT?

What was investigated?

Sequences of photographs were taken to record the process of learning. The photographs were displayed as A4 or A5 images on the wall where children could look at them and revisit their experiences. Learning stories were created featuring photographs of the children learning. These learning stories are emailed home and parents are invited to feedback and comment on their child's learning. Teachers used photographs as a focus for collaboration with parents/whānau, to reflect together on the perspective of the child. Four indicators were used to evaluate the outcomes of the ICT for the babies and toddlers, aged 6 months to 2 years.

Conclusions

Portfolios, photographs and the wall documentation were the most valuable ICT tools for children to re-visit their experiences. The children were able to recognise people who were familiar and important to them, inviting verbal and non-verbal dialogue between children with other children and children with teachers. Photographs enabled teachers to engage in a deeper level of reflective dialogue – 'listening with our eyes'. Emailing the learning stories to parents has ensured that teachers and parents are engaged in dialogue and allows the parent to engage with and celebrate their child's learning. ICT can enhance teaching and learning when teachers and communities are willing and able to go from seeing the potential to realising the potential.

Tots Corner (Kiwis)

Enriching Pedagogical Documentation Through ICT

Puzzle of practice

Amongst the most important learning for children aged two and three is developing relationships. Learning to collaborate, negotiate, co-construct knowledge, listen to others and communicate effectively are all skills needed to form lasting relationships. How can we use digital cameras, slideshows, video clips and portfolios to enrich communication between children, teachers and parents?

What was investigated?

Children and teachers used a digital camera to record learning experiences and photographs and short videos were presented as a slideshow on the computer. Teachers analysed and evaluated these forms of documentation for their value in promoting relationships with peers, teachers and families, using 5 indicators. The evidence for analysis was drawn from children's voice, teacher discussions, written discussions and the parents' voice.

Conclusions

Teachers were surprised at the high level of collaboration and communication that occurred when children (aged two and three years) were using ICT. Access to slide shows, photos in portfolios, video clips and digital stories on CD have enabled children to revisit past work, encouraged non-verbal and verbal language and given children the opportunity to both share and listen to others. ICT appears to be another valuable tool for encouraging and supporting teachers and parents as they communicate together.

Tots Corner (Tuis)

Enriching Pedagogical Documentation Through ICT

Puzzle of practice

Teachers wondered if using ICT could enhance the documentation of their long-term investigations. They asked how could we use ICT as a provocation to engage in dialogue with children providing opportunities for revisiting, reflection and interpreting for their meaning making?

What was investigated?

Photographs, video clips, a data projector, and presentation software (Keynote) were utilised as a provocation for children to revisit, rethink and confront their working theories as they explored areas of interest. The teachers used five areas where the value of ICT as a provocation could be evaluated; revisiting past work; children are engaged together in dialogue; children and teachers are engaged together in dialogue; teachers engaging together in critical reflection on their role in the teaching and learning experience; parents/whānau/community engaged in dialogue about learning.

Conclusions

When children revisited previous learning moments they were able to recall on past experiences and this provided a catalyst in which further explorations could be carried out, allowing the children opportunity to plan and extend their own learning. As children and teachers reflected on previous work, layers of knowledge and deeper understandings developed. Co-constructed documentation using Keynote assisted with continuity and momentum in a context where all teachers work part-time.

Waiuku Kindergarten

More Than a School Visit: ICTs Facilitating the Transition from Kindergarten to School

Puzzle of practice

The centre was operating a programme for children who were almost five years of age, which appeared to be popular with parents. This concentrated on the acquisition of skills such as name writing and only included children who were nearing school age. The teachers began to question this practice and how it fitted within the principles of Te Whāriki and inclusiveness. As part of this review we asked, how can ICT be used to facilitate the children's transition to school programme? The kindergarten feeds into ten schools.

What was investigated?

Initially, baseline data about what individual children knew about school was collected. Teachers then trialled a series of initiatives including photographic booklets showcasing school routines and environments for different schools, corkboards displaying photos of children and the school they were attending, using Skype to connect with a school class and finally a blog that documented children's school visits. The impact of each was analysed using audio clips, photographs, video clips, teacher's reflections, learning stories, children's comments, email,

Conclusions

The use of ICTs to make accessible resources has meant that younger children have picked up transition information through their older peers. The use of ICT has promoted genuine informed communication with families around transition to school as families have used the resources made. Parents have keenly read and contributed to the blog about school visits and their child's first days at school. Using Skype to connect with a school was less easy to sustain than other methods trialled because of timetabling issues. Parents were also less involved with Skype. Transitions can be helped by ICT but finally it is the attitude of teachers in the school (and centre) that determines the strength and nature of the transition processes.

Yendarra Kindergarten

Te Pou Herenga Tangata – Te Pou Herenga Waka

Puzzle of practice

Creating an environment that is based upon kaupapa Māori is a priority for the teachers and the whānau of the children who attend the centre. Teachers wanted to take the opportunity to examine more closely the bi-cultural nature of Te Whāriki through the use of ICT and wondered how they could use ICT to invest in each Māori child the ability to exercise their own rangatiratanga?

What was investigated?

Four supporting Pou (te reo, kaitiakitanga, nga kupu tuku iho and tikanga) were chosen that encompass strategic areas for children to contribute to the retention and growth of te ao Māori. Teachers developed a range of resources (sequence cards, books, DVD), alongside the children, utilising ICTs. These resources supported the processes of understanding the pou and ensured that they retained te reo and tikanga in the context of their own lives. Evidence was gathered from a range of sources and three indicators were used to direct the analysis, ako, whānaungatanga and manākitanga.

Conclusions

The ICT resources developed to increase the use of te reo have become an integral part of the kindergarten environment and are used frequently by the children – both Māori and non-Māori - and their whānau. Digital pepeha books proved successful in giving children and their whānau the opportunity to learn and share their pepeha using the tradition of storytelling. Using ICTs in the context of constructing pepeha was a departure from the traditional approach (reciting according to a set structure). Children became the 'rangitira in the process', creating and telling their pepeha by drawing on what had meaning for them.