

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.