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 herself. 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.

**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.

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)
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 he 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 gauge 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. “It’s 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.

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)

**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)
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.