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Literacy and e-learning: Mining the action research data

Sue McDowall, Ronnie Davey, Ann Hatherly, Vince Ham

Introduction

In this project, researchers and teachers (ECE, primary, and secondary) worked together to analyse unpublished data from a range of action research inquiries on e-learning to articulate, investigate, and build theory about the literacy learning that takes place in e-learning contexts. This summary report provides an overview of our cross-project analysis. The teachers' case studies can be found at: http://elearning.tki.org.nz/Teaching/Literacy-in-e-learning

Key findings

- There was evidence of students in all sectors (ECE, primary, and secondary) encoding and decoding, making meaning with, using, and thinking critically about texts in visual, audio, gestural, spatial, print, and multimodal modes. There was less evidence of students developing critical literacy, and this was so across all sectors.
- Teachers used information and communication technologies (ICTs) to provide students with opportunities to engage in multiple modes, with multiple texts, through multiple technologies, all in the one activity in a way that would be difficult if constrained to traditional pen and paper. There was evidence to suggest that opportunities afforded by e-learning contexts to work across a range of modes supported engagement and achievement in reading and writing print texts, especially for students with a history of underachievement in these areas.
- Teachers used ICTs to scaffold students' literacy learning, enabling students to engage with texts and tasks at a range of levels, including levels beyond what might be expected in more traditional print-based classrooms.
- In general, the complexity of the texts and tasks students engaged with increased across the sectors. However there was much variation within as well as between sectors.
- One difference between what occurred across sectors related to the *type* of texts on which students worked. The ECE teachers made use of the widest *range* of text type in their teaching and in their research analysis.
- Teachers used ICTs to provide the types of learning conditions which, according to the futures-focused research literature, are likely to enable the learning needed for living and learning in the twenty-first century; for example, to personalise learning, build community partnerships, establish decentralised models of learning, collaborate, build learning capacity, and build a systems-level understanding of meaning making.
- By virtue of their inclusion in the project (as e-fellows or participants in ICT professional development programmes), the teachers had in common ICT expertise and a 'futures-focused' approach to education, as well as their disciplinary knowledge in the areas of their research. However, there were considerable differences in the availability, accessibility, and reliability of the ICTs at these teachers' disposal. This finding suggests that while the availability, accessibility, and reliability of ICTs is very important, what is of primary importance is the values, beliefs, knowledge, and skills of teachers.

Major implications

If our goal is to provide students with opportunities to use ICTs to engage in the types of literacy learning needed for living and learning in the twenty-first century and not just as a novel way of meeting twentieth century literacy learning goals, then we need to:

- replace the traditional notion of literacy as the capacity to read and write standard English with a definition that encompasses all modes of meaning making
- act on the implications of such a definition in the development of policy, curriculum support materials, assessment tools, teacher training, professional learning (for policy makers, professional development providers, school leaders, and teachers), and resource development

- ensure that school and ECE structures and systems (such as the nature of buildings and learning spaces, timetables, the groupings of students, and the role and organisation of teachers) support a futures-focused approach to literacy teaching and learning and are open enough for teachers and students to make full use of the various ICTs available.

The research

The main aim of the project was to collectively theorise the literacy-e-learning connections and processes that are operating in New Zealand schools and ECE centres and for teacher researchers to '(re)tell their stories' with a common focus that they did not have when their studies were originally conducted.

The principal research question for this project was: How are e-learning contexts used effectively to support the literacy learning needed for the twenty-first century? Key supporting questions were:

1. What does literacy learning look like in e-learning contexts?
2. What particular conditions support literacy teaching and learning in e-learning contexts?
3. How, if at all, do either of these differ or vary across sectors (ECE, primary, secondary)?
4. What are the research, policy, and practice implications for the ways literacy may be taught and learned in the twenty-first century?

Research approach

We used data that had been archived as part of action research studies that had a focus on literacy learning. These projects were undertaken as part of the e-Learning Fellowship, the ICT professional development programme in schools, and the ECE ICT professional learning programmes. Available data sources included archives of student work, learning stories, video footage, action researcher journals, transcripts or audio archives of teacher and student interviews, observation schedules, and appendices from the teachers' original action research reports.

Lead researchers and teachers collaborated in sector teams to analyse the data. The group as a whole then engaged in collective data analysis and discussion of emerging themes.

We used an adapted version of the 'four resources' model (Freebody & Luke, 1990; Luke & Freebody, 1999) as our main framework for analysing the data. The four resources model separates the repertoire of literacy practices into four main roles—code breaker, meaning maker, text user, and text analyst—and emphasises that each is necessary but not sufficient in any act of meaning making.

The code breaker role involves practices required to crack the codes and systems of language; the meaning maker role is to construct cultural meanings of text; the text user role, to use texts effectively in everyday, face-to-face situations; and the text analyst role, to analyse, critique and second-guess texts.

It is important to note that while we used the different repertoires of literacy practice from the four resources model to *analyse* different components of the literacy activities observed, these were not taught or practised in isolation from each other as separable skills. From ECE to senior secondary school, all of the activities studied involved all of the roles, with each to a lesser or greater degree being brought to bear on the learning activity.

Research findings

Use of texts

We saw evidence of students in all sectors learning to decode and encode texts in a range of modes. In the ECE sector, for example, a group of children learnt how to develop their own pepeha and present it in Kid Pix, others learnt how to use the digital camera, sequence photos to make a slideshow, film and edit video, use Kid Pix to record stories and ideas visually or as print, insert pictures and edit, and use iMovie to insert photos and sound. In the primary sector, students learnt to use the functions on a flip camera, sequence ideas when constructing an oral text and to speak audibly when recording. In the secondary sector, students decoded newspaper articles, blogs, television news reports and interviews encompassing print, graphics, moving images and sound, and responded to these through formal writing on the class blog, demonstrating understanding of structures and language features such as paragraphing, dialogue, and camera angles.

We saw evidence of students learning how to *make meaning* of and with multimodal texts. In the ECE sector, for example, students learnt how to combine and sequence the use of Kid Pix images, pictures and sounds downloaded from the internet and photographs of themselves and their artworks to create movies that were meaningful to them. In the primary sector, students developed an understanding of the relationship between their voice and expression and its effect on an audience through the feedback they received on blog posts. Others engaged in acts of re-design,[1] juxtaposing genres and modes that are not usually associated by depicting their section of the class film on Shackleton's Antarctic journey in rap and by including the lyrics of a 1970s pop song 'Don't rock the boat'.

We saw evidence of students learning to *use texts*, that is, to participate and contribute as members of discourse communities,[2] such as those of artists, actors, orators, film makers, script writers, and authors. For some students, this involved 'trying on' the identities associated with different discourse communities in the classroom context; for others, practising with 'captured' audiences beyond the classroom, and for a few, adopting these identities for authentic purposes in the out-of-school world. For example, one child from ECE, when showing at home the movie he had made, insisted on having the lights turned off and the sound up loud through the speakers so that it would be like a 'real' movie. Others, in response to a book documenting the work of Andy Goldsworthy, took photographs of their ephemeral art works in the sand pit or stone pit so they had a record of them like 'real' artists do. In the primary context, students learnt how to take on the role of presenters by smiling before reading their text, varying their voice to engage the audience, and smiling again at the conclusion of their recording. They posted their presentations on the class wiki and sought the feedback of students from other schools. Other primary students created podcasts of reviews of New Zealand books and received feedback from around the world. In the secondary context, students were required to shape texts in ways appropriate to the genre in which they were working.

We saw less evidence of critical literacy; that is, of students learning to *analyse* or 'second guess' texts. This was so across all sectors. Critical literacy involves the inclusion of multiple perspectives that can be presented and challenged by students. Through experiencing differing interpretations and positions, students can, over time, begin to see positions as socially constructed and ideologically charged. Students in all sectors had opportunities to present, explore, and challenge multiple perspectives. In one primary school class, for example, the teacher provided students with different versions of a historical event in several different modes so as to build their capacity to analyse the different ways stories can be told and the effects of these different versions. In the secondary context, there was some evidence that students were beginning to understand the concept of representation, and how the text can position the reader.

1 We draw here on the New London Group's (1996) concept of re-design.

2 We draw here on Gee's (2008) concept of discourse as the ways particular groups of people behave, interact, value, think, believe, speak, read and write.

Use of ICTs to support reading and writing print texts

Teachers used ICTs to provide students with opportunities to engage in multiple modes, with multiple texts, through multiple technologies, all in the one activity in a way that would be difficult if constrained to traditional pen and paper. There was evidence to suggest that opportunities to work in these ways supported engagement and achievement in reading and writing print texts, especially for students with a history of underachievement in these areas. This finding is consistent with McDowall (2010)[3] and Haggerty (2010).[4]

Use of ICTs to scaffold literacy learning

The teachers used ICTs to *scaffold* students' engagement in literacy practices, enabling students to engage with texts and tasks at a range of levels, including levels beyond what might be expected in a more traditional print-focused classroom.

The use of ICTs enabled students to engage with *knowledge* which they may not have been able to access through print alone (due to their capacity to decode print text), thus overcoming the challenge raised by Moje (2008)[5] of how to simultaneously build knowledge and engage students with the texts of a discipline. The use of ICTs also enabled students to engage in literacy *tasks* at levels which they may not have been able to achieve through print alone.

This finding is consistent with the view found in the work of Vygotsky,[6] Bruner, and Egan[7] that tools (such as ICTs, language, and theoretical frames) provide the cognitive scaffolding needed to mediate learning. The finding is an important one because the futures-focused research literature tells us that *all* students, not just those destined for university, now need opportunities to build high level cognitive capacities.

Complexity of texts and tasks across sectors

In general, the *complexity* of the texts and tasks that students engaged with increased from the ECE through to secondary sectors. However there was much variation within as well as between sectors. Students in one of the ECE centres, for example, worked successfully (scaffolded by their teachers) with the works of adult artists and a Year 7/8 class made extensive and sophisticated use of a picture book version of Shackleton's Antarctic journey alongside documentaries aimed at an adult audience. Teacher decisions about texts were determined as much by their usefulness for purpose as for their 'match' with the meaning-making abilities of the students concerned. Teachers then altered the level of scaffolding provided (assisted by the use of ICTs) to ensure that texts provided the right amount of challenge for the students concerned.

The skills required to determine the difficulty of, and scaffold students' use of, multimodal texts are complex. Teachers needed to understand what makes texts in different modes difficult and the challenges and supports that can be wrapped around such texts to ensure that they can be used effectively for learning.

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3 Findings from this study of the classroom-based inquiries into literacy teaching and learning carried out by the 2009 e-fellows suggest that opportunities to work across a range of modes supported engagement and achievement in reading and writing print texts.

4 Haggerty (2010) draws on her work on Wadestown Kindergarten's Centre of Innovation multiple literacies project (Simonson, Blake, La Hood, Haggerty, & Mitchell, 2009) to describe how graphics, photos, and movement frequently provide the bridge to print for children in early childhood education.

5 Moje sees knowledge as important because learning the norms of practice and identities of a discipline involves reading the texts of that discipline, and without background knowledge of a discipline these texts are difficult to understand and engage with. The challenge is how to simultaneously build knowledge and engage students with the texts of a discipline. The solution, according to Moje, can be found in the use of supports of various forms including the multiple text types and new media available to the disciplines, which can enable students to access texts they might not be able to read on their own.

6 Vygotsky (1997) conceives of development as picking up sets of cognitive tools as we grow up in a society.

7 Kieran Egan (2008, 2010) proposes redefining the purpose of education as "learning to use as well as possible the cognitive tools developed in our evolution and cultural history" (p. 6).

Type of texts used across sectors

There were differences across the three sectors in the *type* of texts on which students worked. The ECE teachers made use of the widest *range* of text type in their teaching and in their research analysis. These included spatial texts created in the sand pit and stone pit, with blocks or other objects; gestural texts created during dance, movement, cultural protocols, or conversation; narrative texts created through sequences of play; and audio effects through the use of instruments, voice, or everyday objects. Many of these texts were ephemeral and the construction and interpretation of meaning was often fleeting. The ECE teachers used ICTs to capture these moments and analyse the literacy learning occurring. They also used these texts with students to revisit experiences and engage them in further elaborations on their learning, or with families and whānau to highlight students' learning and abilities.

Use of ICTs to create a futures-focused literacy learning environment

The findings of this research suggest that teachers with a futures-focused approach to education can use ICTs to amplify opportunities for the types of literacy learning needed for living and learning in the twenty-first century. We saw examples of ICTs being used across ECE, primary and secondary school settings to:

- personalise literacy learning and cater for diversity by providing students with a range of modes in which to interpret and construct text (ICTs gave students greater choice about how to make meaning of and with texts and opportunities to specialise according to their strengths and interests)
- build community partnerships to support literacy learning (ICTs gave students new opportunities to share their texts with, and elicit feedback from, people in time and place that would otherwise be unavailable to them)
- establish decentralised models of learning (teachers used ICTs such as class wikis to establish decentralised systems which encouraged talk between students rather than through the teacher, resulting in a change of the traditional teacher–student roles and relationships)
- collaborate (there was some evidence to suggest that students were more likely to: contribute to group discussion, engage in more balanced discussions, to look at and discuss each others' work, to elicit and respond to feedback from peers, to take greater risks in what they were prepared to ask or say, and to engage in more thoughtful and extended discussions)
- build learning capacity (there was evidence to suggest that the use of ICTs contributed to an increase in the complexity of student meaning making by making it easy for students to record, replicate, circulate, and revisit their texts, and those of their peers. Students revisited the texts they created many times, often through different modes and there were opportunities for new interpretations to emerge in the spaces between the re-reading of a text over time. The artefacts produced from this interpretive work generated further discussion, setting up a positive feedback loop of increasingly rich meaning making)
- build a systems-level understanding of meaning making (the use of ICTs provided students with many more textual choices than available in a more traditional print dominated environment, providing opportunities to compare the ways in which meaning can be made in different modalities, the textual choices available when making meaning for different social purposes, and the relationship between textual choices and social purposes).

Conditions of teaching

The teachers all had what Mishra and Koehler (2006) refer to as technological, pedagogical, and content knowledge (TPACK). Mishra and Koehler describe TPACK as a contingent and flexible kind of knowledge that lies at the *intersection* of technological knowledge, pedagogical knowledge, and content knowledge. This knowledge was important as it enabled the teachers in our study to provide students with opportunities to use ICTs for literacy learning in ways consistent with the norms and practices of the learning areas in which they worked.

The ECE and primary school teachers came from contexts in which the structures and systems were mostly already well aligned with a futures-focused approach to teaching and learning. There was flexibility in the timetable, use of learning spaces, groupings of students, and organisation of staff. This was not always so for teachers working in secondary school contexts, where they faced barriers associated with all of these.

The teachers worked in a wide range of ICT contexts. While some had access to fully equipped computer suites, pods of classroom computers, ICT support staff, and class sets of equipment such as digital cameras or digi-recorders, many faced challenges relating to the availability, accessibility, or reliability of ICTs.

In all cases, teachers had adopted strategies to overcome or compensate for structural, systemic, or ICT challenges to provide the learning literacy opportunities they considered important. However, this often used teacher time that might have been better used for the purpose of teaching.

Implications

The increased resourcing of ICTs in schools and early childhood centres and the introduction of ultra-fast broadband will ensure a more equitable ICT landscape across New Zealand schools and centres and will greatly support teachers, such as those involved in this study, to provide opportunities for the types of literacy learning needed for living and learning in the twenty-first century.

The risk is that, because of the predominance of traditional notions of literacy (as the capacity to read and write standard English) at all levels of the education system from policy makers through to classroom practitioners, and the structural and systemic barriers to future-focused approaches to literacy teaching and learning, the potential of increased ICT resourcing will only be realised in the classrooms of future-focused teachers such as the ones involved in this study.

If our goal is to provide e-learning contexts with the purpose of providing students with opportunities to engage in the types of literacy learning needed for living and learning in the twenty-first century and not just to provide novel ways of meeting twentieth century literacy learning goals then we need to:

- replace the traditional notion of literacy as the capacity to read and write standard English with a definition that encompasses all modes of meaning making and within different cultural contexts
- act on the implications of such a definition in the development of policy, curriculum support materials, assessment tools, teacher training, professional learning (for policy makers, professional development providers, school leaders, and teachers), and resource development
- ensure that school and ECE structures and systems (such as the nature of buildings and learning spaces, timetables, the groupings of students, and the role and organisation of teachers) support a futures-focused approach to literacy teaching and learning, and are ‘open’ enough for teachers and students to make full use of the various ICTs available.

References

Egan, K. (1997). *The educated mind: How cognitive tools shape our understanding*. Chicago: University of Chicago Press.

Freebody, P., & Luke, A. (1990). Literacies programs: Debates and demands in cultural context. *Prospect: Australian Journal of TESOL, 5*(7), 7–16.

Gee, J. P. (2008). *Social linguistics and literacies: Ideology in discourses*. (3rd ed.) London: Routledge, Taylor & Francis.

Gilbert, J. (2005). *Catching the knowledge wave? The knowledge society and the future of education*. Wellington, NZCER Press.

Haggerty, M. (2010). *Focusing on the interplay between literacy modes*. Retrieved from http://www.educate.ece.govt.nz/learning/exploring

Hatherly, A., Ham, V., & Evans, L. (2009). *Effective learning in early childhood education? The impact of the ECE ICT PL programme. A synthesis report*. Retrieved from http://www.educate.ece.govt.nz/

Luke, A., & Freebody, P. (1997). The social practices of reading. In S. Muspratt, A. Luke, & P. Freebody (Eds.), *Constructing critical literacies*, pp. 185–225. New Jersey: Hampton Press.

Luke, A., & Freebody, P. (1999). A map of possible practices: Further notes on the four resources model. *Practically Primary, 4*(2). Retrieved from http://www.alea.edu.au/freebody.htm

Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054.

McDowall, S. (2010). *Literacy teaching and learning in e-learning contexts*. Wellington, Ministry of Education.

Moje, E. B. (2008). Foregrounding the disciplines in secondary literacy teaching and learning: A call for change. *Journal of Adolescent and Adult Literacy, 52*(2), 98–107.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review, 6*(1), 1–20.

OECD. (2005). The definition and selection of key competencies: Executive summary. Paris: Author. Retrieved from http://www.oecd.org/dataoecd/47/61/35070367.pdf

Simonson, Y., Blake, M., La Hood, A., Haggerty, M., and Mitchell, L. (2009). *A curriculum whāriki of multimodal literacies: Wadestown Kindergarten's Centre of Innovation Research*. Wellington, New Zealand: Ministry of Education.

Vygotsky, L. (1978). *Mind in society*: The *development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Project team

Claire Amos (Epsom Girls' Grammar); Chris Bradbeer (Stonefields Primary School); Dorothy Burt (Point England School); Ronnie Davey (University of Canterbury); Vince Ham (CORE Education); Ann Hatherly (CORE Education); Marion Lumley (Otaki College); Carol Marks (Selwyn Kindergarten); Sue McDowall (NZCER); Margie Meleisea and Lynne Paul (Nayland Kindergarten); Mere Ngapo (Te Rau Oriwa); Helen Rennie-Younger (Sunnybrae Primary School).

Project contact

Dr Vince Ham

Director Research
Tel: +64 3 379 6627
Mob: +21 999 147
Email: vince.ham@core-ed.org