Realising the Power within: Literacy partnerships with information and communication technologies (Focus on Year 1-6 students (Grades K-5))

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Introduction

In this paper, brief consideration is given to the macro-influences of changing views of literacy and new text-types. A literacy research study (Mason, 1999) which attempted to synthesise some of the evolving threads of literacy practice is briefly described and implications listed. The conditions for learning encapsulated in Roder and Hunt's diagrammatic framework (appendix 1) underpin the thinking behind this paper.

Change

> Painted Jaguar's eyes turned truly cartwheels in his head. Then he went to fetch his mother.
>
> 'Mother,' he said, 'there are two new animals in the woods today, and the one that you said couldn't swim, swims, and the one that you said couldn't curl up, curls; and they've gone shares in their prickles, I think, because both of them are scaly all over, instead of one being smooth and the other very prickly; and besides that, they are rolling round and round in circles, and I don't feel comfy.'
>
> 'Son, son!' said Mother Jaguar ever so many times, graciously waving her tail, 'a Hedgehog is a Hedgehog, and can't be anything but a Hedgehog; and a Tortoise is a Tortoise, and can never be anything else.'
>
> 'But it isn't a Hedgehog, and it isn't a Tortoise. It's a little bit of both, and I don't know its proper name.'
>
> 'Nonsense,' said Mother Jaguar. 'Everything has its proper name. I should call it "Armadillo" till I found out the real one. And I should leave it alone' (Kipling, 1953).

Kipling's story of the beginning of the Armadillos was first printed in 1902. Nearly a century later we are in the midst of significant literacy-related change connected with the advent of the Information Age. Many of us feel like Painted Jaguar – not "comfy"! Change itself seems changed: our perceptions of time and space are altered when we can interact more or less instantly with people half a world away through telecommunications and the Internet. In this uncertain world – what is round the corner? – the known can appear very comforting. But is this the perception of our students?

Change applies to views of literacy too. Unitary, or traditional, definitions of literacy assume that literacy refers to a finite set of skills related to print-based text, for example "*literate, (adj.) learned: able to read and write"* (Chambers Twentieth Century Dictionary). *English in the New Zealand Curriculum* affirms the primacy of oracy and semiotics in language acquisition (Ministry of Education, 1994: 19) and expects equal development of oral, written and visual English in classrooms. However it is probable that many New Zealand primary school classrooms operate on assumptions about literacy that are based on traditional views.

In fact "literacy" has never been confined to a finite set of skills; literacy continually changes in relation to historical, cultural, and technological contexts. The world we live in is the defining context for "literacy" (Manguel, 1996, in Leu, 1997: 63). Our post-modern world is one of plural ideologies, cultures and languages, and gives rise to pluralist views of literacy. There are multiple literacies[1]. The world of the Information Age, with its ever-changing information and communication technologies and texts, is presenting new text-types and ways of "knowing the world" for us to capture and make sense of (Todd, 1998: 29, Leu, 1996: 162).

Oral language, semiotics and also traditional codes of reading and writing are used in new ways in these new texts, hence different literate activity for access and composition is needed. Many students in New Zealand today have access to literally millions of texts and virtual experiences at home or at school through the Internet. The convergence of the Internet and digital TV suggests that access to digital text will

[1] See appendix 2: Diagram of balanced literacy programme

normalise itself quite quickly within homes. Hence the need for students to be able to create their own informed critiques of text has never been greater. They need what McKenzie calls "…the tools to overcome the weaknesses of the new information sources… a toolbox of thinking and problem solving skills (1998: 27). This "toolbox" is at the heart of innovations that are developing as teachers adapt literacy teaching and learning strategies in accordance with the power and constraints of the new texts (Ryba, 1996: 4).

Open-ended views of literacy are developing as contemporary contexts for literacy change. The emergence of new and constantly changing text-types related to information and communication technologies means that for many now the word "literacy" refers not to an achieved state, but rather a lifelong process of "becoming literate" as users grapple with what it means to use these texts fully. In fact what it means to become literate is a "moving target, one we can never define, because information and communication technologies continually change" (Leu, 1997: 62).

Linear and non-linear text

Linear texts, especially books, have traditionally been the textual foundation in literacy programmes. Many digital age books contain non-linear features but in effect almost all books are linear and static in their nature, composition and structure, containing sequenced or clearly structured genre such as narrative, reports, explanations, recounts and arguments. New non-linear texts may contain all these elements, but in increasingly complex forms (Kinzer & Leu, 1997: 134). [2]

Hypertexts such as CDRom encyclopedia and Internet, and some authoring software, for example Hyperstudio, are non-linear. Hypertext is a very complex text-type because it is usually multi-modal with oral, visual and written genre providing a huge range of meanings. It is also expansively structured in a manner that is radiating rather than sequenced, and connections can be made in all directions across the text.

Hypertext is a rich medium for literacy learning because its interactive qualities and ability to present multiple representations of knowledge are compatible with student-

centred constructivist classrooms (Swan & Meskill, 1997: 130). Student users are involved in thinking in new ways in order to engage with the richness of the layers of hypertext, and the possibilities for creative thinking are high. Digital age kids develop deep strategies for making sense of complex stories embedded in multimedia Playstation-like adventures. These strategies more often focus on visual language processing and the seeking for connectedness of ideas in the story. The conditions are set for natural hypertextual-type thinking to develop. Hypertexts have the potential to, and do, transform student learning.

It is important, however, for us to come to grips with the implications of these new texts for our students and for our teaching (Mason, 1999: 178). This huge and complex process won't happen by chance. Successful literate activity with hypertext requires multiple approaches to move students from passive surface viewing and authoring to active deep engagement with meaning. New ways of supporting students to strategically access and process non-linear text can grow both out of the structural and linguistic demands of the texts themselves, and also from the adaption of successful existing literacy teaching practice. Thus non-linear texts can, and do, transform teaching. The responsibility rests with our selves as educators (Ryba & Brown, 1998: 5-7).

We certainly don't advocate the subordination of traditional text in literacy programmes, or less focus on the basic processes of oral, visual and written language. But we do advocate a shift in focus to accommodate the reality of the fast-growing importance of non-linear text, especially the Internet, and of non-linear features in books, as shifting contexts for literacy. We also advocate the need for teachers to be able to confidently support students in their interactions with these texts (Leu, 2000).

Burning questions

With new things we can turn away like Mother Jaguar, or we can explore and take risks. What are key features of literate activity when hypertext is used? How do classroom patterns influence information literacy acquisition when hypertext is used?

[2] See appendix 3: Table of text-type contrasts

What teacher strategies are successful in supporting students' use of hypertext? What do students think and know about learning and literacy and hypertext?

A research study

The research study (Mason, 1999) evolved from curiosity and excitement about new text-types, and in the light of reading that more research was needed about the effects of new text-types on literacy learning (for example, Wild, 1996, and Kinzer & Leu, 1997). The main aim of the research study was to identify some implications for teaching and learning, of hypertext use in relation to information literacy acquisition. An ecological-constructivist approach which examined a learning culture through analysis of interactions between students and teacher and texts, and analysis of the general environment (Ryba, 1994) was adopted.

Roder and Hunt's framework (appendix 1) outlines some considerations for best practice when ICT is an integral part of classroom literacy programmes. These principles were applied to the practice of the research study in order to guide the planning and facilitation of learning [3]. Particular emphasis was laid on the following features:

1. Creating a community of practice.

The researcher consciously attempted to create a "socially interactive, reflective" micro-environment where opportunities abounded for students to become capable literacy learners through use of ICT (Ryba, 1996: 3-5) and to "learn to talk" in ways that took individuals from peripheral to full participation in the "intellectual collective" (Lave & Wenger, 1991: 37, 109). Through guided participation in the learning community, students' own learning processes were transformed as they progressed within a "collective zone of proximal development", supported by peers and teacher (Ryba, Selby & Kruger, 1999). Pairs of students were "trained" as "experts" in one of three areas: hypertextual search strategies, a reciprocal strategy for accessing hypertext articles, and some authoring strategies. When the training was completed the students were "re-paired" across the original pairings, so that each student had some specialised strategies for operating on hypertext to offer their peers.

This dissemination of expertise strengthened socially-constructed learning, balanced up apprentice–mentor relations, and maximised collective strategic efficacy in hypertext use.

2. An infrastructure for inquiry-based literacy learning.

The study was conducted within a daily class programme. Content for the students' activity was related to current thematic work in the classroom. The framework adopted to guide students' inquiry processes and to assist them to use higher-order thinking strategies to identify, interpret and negotiate meanings was the Action Learning Model (Gawith, 1987). The six stages of the model - deciding, finding, using, recording, presenting, evaluating – provided "a metacognitive context" for student thinking (Gawith, 1998: 7).

The study was conducted over a period of ten weeks in a decile 3 primary school year 5 and 6 classroom. There were three phases of research:

Phase 1: ascertaining the class "zone of current functioning"

The existing classroom learning culture was observed and analysed and some paired activity with hypertext introduced and observed. Students were interviewed. Some trends were identified from the information.

Phase 2: creating a collective "zone of proximal development"

An "intellectual collective" as described above was set up.

Phase 3: ascertaining the class "zone of future functioning"

The micro-environment was trialled, observed, and analysed in order to ascertain changes and development within the "intellectual collective". Students were interviewed again. Information was analysed and discussed in the light of trends identified in Phase 1.

Results in brief

Phase I: class "zone of current functioning"

[3] See appendix 1 "Skills for an IT learning culture"

This phase found that a positive social climate existed, but some negative effects of the class teacher's talk on learning were significant. The students and teacher had little experience of hypertext, and there was little evidence of strategic knowledge about text or reflective/metacognitive activity. The incidence of engagement and shared cognition lifted when students worked in pairs using hypertext.

Phase 2: creating a collective ZPD

It was apparent that researcher modelling of hypertext use was immediately reflected in students' use of hypertext, that students were quick to respond to and use strategies with hypertext, and there was a further increase in the incidence of cognitive and metacognitive activity.

Phase 3: class "zone of future functioning"

There were clear increases in speed and confidence in navigation and construction of hypertext and interactions that applied higher order thinking to construction and negotiation of meanings using hypertext. There was a marked increase in creative recomposing and presenting of information using hypertext and the beginnings of a shared "language" for thinking about and discussing hypertext (a metalanguage).

Some implications for best literacy practice from the research study:

- A socially-interactive, reflective learning community where expertise is shared, and deliberate processes to develop a "language for thinking" are apparent, is a critical quality factor in students' learning about hypertext
- Teachers and students need to make shifts in the ways they process text when interacting with the structural and linguistic complexities of hypertext
- Teachers need knowledge of the terms and features of hypertext in developing their own "language for thinking", in order to support students' literacy acquisition
- Teachers need to design learning opportunities for students to reflect on and use the language of hypertext
- Authoring of hypertext provides students with a personal conceptual "bridge" into understanding the nature and structure of more complex hypertext

Conclusion

The use of new information and communication technologies and new text-types can provide powerful learning experiences, provided we can avoid the confusion that may arise from the sheer complexity and quantity of such texts. Yet, ironically, these complex and exciting texts provide a perfect field for our students to unlock the power within them selves through use of problem-solving and the conceptual tools for processing. Kipling's Painted Jaguar was faced with similar confusion when he was confronted by a creature which no longer conformed to any known animal type: his thinking and problem-solving skills were minimal. Mother Jaguar's advice to ignore the creature is not helpful to us in this Age of Information where hypertext may soon predominate. It is time to trial, and advance, more strategies for literacy learning which relate to this field of text, and to situate the new texts firmly within the wider field of text in order to support students' independent thinking and the realisation that the power to learn lies within themselves.

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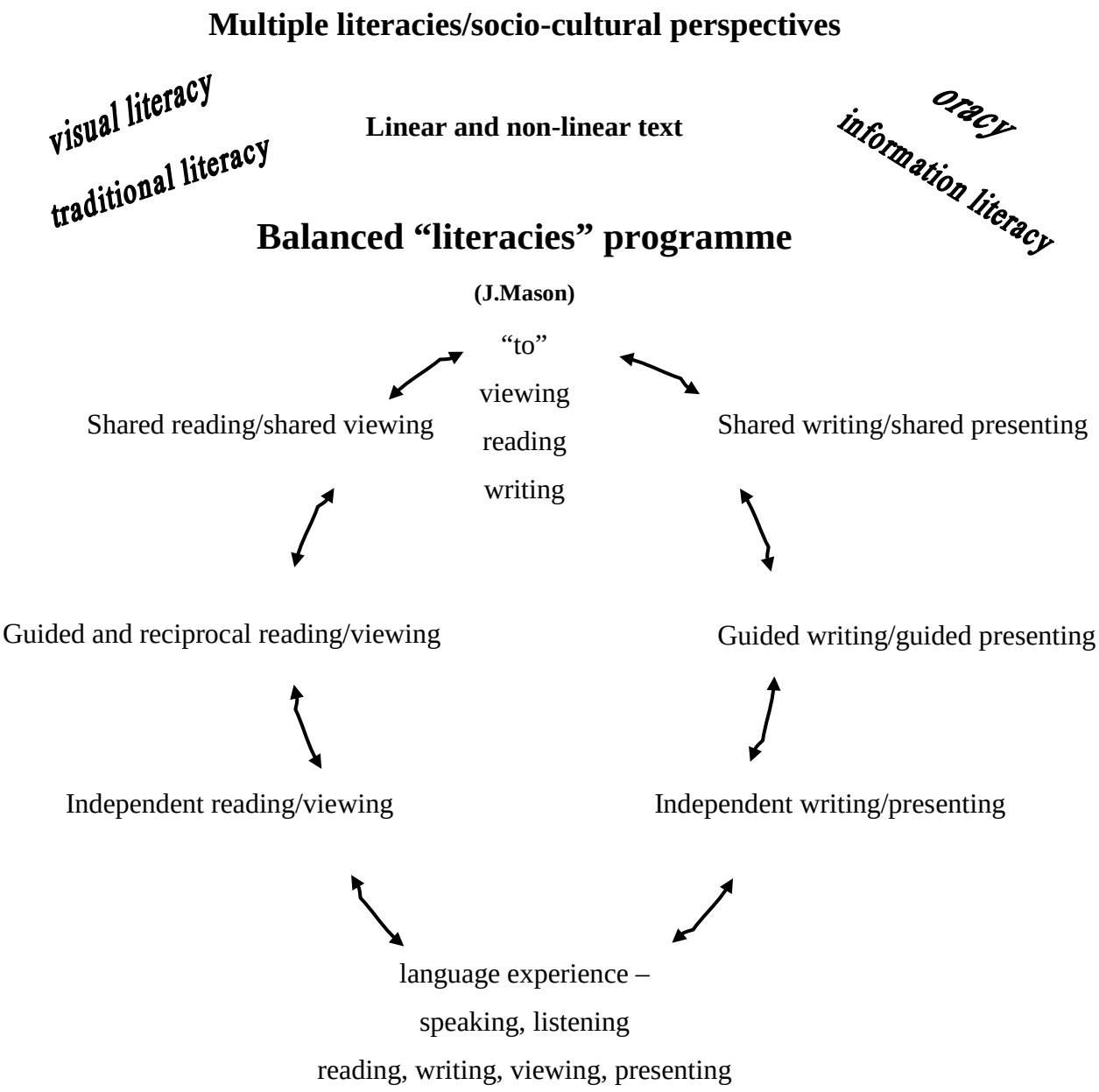
Appendix 1

Roder and Hunt's framework (see following page) for understanding which skills should be seen as a necessary part of good practice in an information and communication technology **(ICT) learning culture.** (The term ICT reflects the New Zealand context. In the general sense ICT is also referred to as IT.)

The notion of an ICT culture is often only described in terms of its technical features and its digital nature. This model takes this as understood and acknowledges that children are growing up with new and very different cultural tools that are quickly normalising themselves as part of their world. The multiple literacy debates also have a place in helping us to accept new realities about how learners need to function, particularly in a world of text that is no longer fully dominated by print. Much has been made of the overwhelming diversity of information now available. There is a growing imperative to develop the kinds of cognitive information literacy skills that will equip learners to make sense of these sources in new and deeper ways. This model accepts these elements as part of the changing world relating to ICT, and sets these up as a backdrop against which a more inclusive 'learning' dimension also needs to be described. The aim here is to shift the emphasis from the tools themselves and the nature of our digital world, towards a direction that considers what other skills are needed to develop if we are to establish an effective ICT ‘learning’ culture. To that end the **social, thinking and metacognitive** dimensions are foregrounded. This is seen as a more useful framework for examining our goals and the kind of learning conditions we should aim for with regard to what constitutes strong educational ICT practice.

Appendix 2


Multiple literacies/socio-cultural perspectives
visual literacy
traditional literacy
Linear and non-linear text
oracy
information literacy
Balanced "literacies" programme
(J.Mason)
"to"
viewing
reading
writing
Shared reading/shared viewing
Shared writing/shared presenting
Guided and reciprocal reading/viewing
Guided writing/guided presenting
Independent reading/viewing
Independent writing/presenting
language experience –
speaking, listening
reading, writing, viewing, presenting

Appendix 3

Text-type contrasts

Linear text	***Non-linear text***
Constant, static textual foundation	dynamic, responsive textual foundation (1994: 215)
Static, unable to be physically manipulated	altered at each encounter; unique, self-guided exploration: students can manipulate and modify the text base and changes are immediately and directly available to others (1994: 216)
Favours more individual cognition	encourages more social cognition (1994: 216)
Requires "micro" processing	requires "macro" or global processing – students who become "lost in cyberspace" may not be able to comprehend at the macro level (1994: 217)
Demands readers make own linkages	promotes inter-domain linkages and references such as hotlinks (1994: 217)
The "artifact" of the text is more permanent therefore lending itself more towards "private", implicit processing	the text is more dynamic and socially-constructive therefore lending itself to explicit inter-domain references (1994: 217)
	has the potential to transform students' interactions with subject matter through the interplay between students, computer-mediated texts and the general learning environment

From Mason, 1999: 26. This table is based on Alexander, P., Kulikowich, J. & Jetton, T. (1994). The Role of Subject Matter Knowledge and Interest in the Processing of Linear and Non-Linear Texts. *Review of Education Research, 64*(1Summer), 201-251.