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Title

Reading beyond the lines? The role of digital texts and technology in reading groups

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Abstract

Classroom practitioners are beginning to incorporate new technologies into literacy experiences. While these attempts are bridging the technological divide in classrooms between old and new literacies, some researchers argue that teachers and students are not necessarily engaging with new literacies when using new technologies (Lankshear & Knobel, 2003b). This paper discusses research conducted using a survey, interviews and classroom observations, on the use of technology during 'reading groups', in Early Stage 1 and Stage 1 classrooms in rural New South Wales. Technology was found to be most frequently encountered by small groups and individual students, working independently of the teacher. Students typically used electronic storybooks and drill and practice applications. This research illustrates the need to expand the definition of 'text' to close the technological gap in beginning reading pedagogy. Technology mediate texts must be endorsed as legitimate, and explored as part of the reading corpus in explicit reading instruction.

Keywords

Digital texts, technology, literacy experiences, new literacies.

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Introduction

Technology is becoming ubiquitous in the lives of children in countries such as Australia, the United Kingdom and America (Lenhart *et al.*, 2007; Livingstone & Bober, 2005; Nixon, 2003). Literacy researchers are showing increased interest in ICT, with many arguing for new approaches to literacy education that embrace the relationship between ICT, reading and writing (Lankshear & Knobel, 2003a; Mackey, 2003; Marsh, 2006; Unsworth, 2006). There is an increasing body of research that focuses on the use of technology to enhance the acquisition of literacy and supporting literature that describes how to use ICT within schools, including that which deals specifically with the use of ICT in literacy education (Merchant, 2008). However, research focuses on the merits of ICT tools, but does not appear to determine ICT's current place in the literacy classroom.

In New South Wales, ICT is incorporated in student learning Outcomes and Indicators across Syllabus documents, such as the New South Wales K – 6 English Syllabus (Board of Studies New South Wales, 2007). The State Literacy Strategy support materials (New South Wales Department of School Education, 1997) recommend students experience daily literacy instruction through both Modelled and Guided reading and writing time with the teacher, and Independent practice. This process is referred to as the “daily literacy session” (New South Wales Department of School Education, 1997, p. 55), with a component of this commonly referred to among teachers as reading groups. As technology features in the English Syllabus reading outcomes (i.e., Board of Studies New South Wales, 2007, pp. 28-35) and conducting reading groups is a common strategy for teaching reading, it follows that ICT is likely to be used during reading group sessions in K – 2 classrooms in New South Wales. The study reported here aimed to establish which technologies are being used in reading groups, and how, as well as explore teacher perceptions about the role of technology in reading groups.

Review of surrounding literature

There is a wide digital world that young children can access, and many young children are encountering digital texts and technologies. In Australia, nearly 40% of 5 – 8 year olds have used the Internet (ABS, 2006). Pre-school age children are also engaging with technology, with one American study (Rideout *et al.*, 2003) finding that half of the participating children under six have used a computer, and a quarter of 0 – 3 year olds have used a computer independently of their parents. Some young children even use the Internet independently, with the study reporting that nearly a third of 4 – 6 year olds have visited websites on their own (Rideout *et al.*, 2003). It is perhaps not surprising that young children are using technology, but what is important to note is the near-equal division between children who engage with digital media and those that do not. To capitalize on young

children's wealth of prior experiences as well as bridge the gap for children who are not engaging with technology, research is needed into the best ways of learning about and with new texts and technology in the literacy classroom.

Research regarding the application of technology in the literacy classroom abounds, but there is very little situated in early childhood. That which examines young children's formal literacy induction is skewed towards using technology to read and decode conventional alphabetic text, and does not adequately consider technology or new technology-mediated texts, such as electronic readers, CD-ROM storybooks or web pages, as core components of literacy learning. New forms of texts and technologies '...add to children's choice of medium to represent ideas and to comprehend the meanings in a range of texts... [and d]igital literacies and print-based literacy are not oppositional concepts, both are required' (Hill, 2004:viii). As Lankshear and Knobel (2003b) assert, little attention is paid to positioning students "... as 'insiders' of practices and discourse communities that extend beyond conventional classroom reading and writing" (p. 77). Research that focuses on decoding alphabetic text is only the start to bridging the technological divide in classrooms between traditional and contemporary literacy practices. The next step is to position technologies and technology-mediated texts in the literacy classroom as texts in their own right, rather than just a means to an end, and make room for explicit instruction regarding how to read and write these kinds of texts.

Technology-mediated texts are core to the emerging literacy practices of today's youth (Lenhart et al., 2007), and the role of technology as a key feature of early, formal and explicit reading instruction is worthy of being explored. Two cases that examined the Language Experience Approach (LEA) to early literacy development, discussed the role of technology in formal literacy learning and teaching. Turbill (2003) and Labbo, Eakle and Montero (2002) explored the inclusion of digital experiences in LEA (*D-LEA*). Both studies provided opportunities for individual young children (5- and 6-year-olds) to construct texts using new technologies outside of the classroom setting. However, as the authors conceded, this is only the starting point for research. These studies involved children in out-of-class, individual activities, and did not explore ways in which learning activities may allow for all students within a classroom to learn about and with digital texts and technologies on a regular, systemic and explicit basis.

Another study explored the role of technology in literacy teaching in Kindergarten classrooms over a twelve-month period. Turbill (2001), as a participant-observer, reported on the difficulties experienced by teachers when implementing technology in the literacy program, including faulty hardware, limited technical support, limited appropriate software for teaching reading and limited time to learn how to use technology. She found that just as young children need to learn Clay's (1979) concepts of print (cited by Turbill, 2001), so too do they need to learn concepts of screen to become literate in the demands of computers. The teachers in this study largely saw reading as decoding print, and technology as useful if it assisted in this learning process. Turbill (2001) argued that a broader definition of reading needs to be fostered that includes reading visuals and animation (Turbill, 2001).

She identified the emphasis on the modelled, guided independent learning cycle evident in the participating teachers' classrooms, but it was not clear how these instructional strategies employed technology. Also, the study was limited to one metropolitan school, and begs the question; do K - 2 teachers in other regions have similar attitudes towards technology, and experience similar difficulties?

Hill (2004) undertook a larger-scale study on the role of ICT in 4- to 8-year-old children's learning in homes and school-based settings across 20 research sites. Among other things, Hill sought to explore the ways in which young children in early childhood classrooms used technology. She noted that children in classroom settings tended to use 'the computer to play games, to find information, to explore their interests and to create new texts' (2004:x) and that learning was mostly inquiry-based and arising from child interest. Hill also found that explicit instruction in using technology and software, as well as deconstructing and critiquing multimedia texts was important.

The above review indicates that young students are engaging with digital texts and technology, but that there is limited research into how formal literacy learning might include digital texts. Instead, it focuses on technology as a means to better teach students how to decode alphabetic print. Much of the research that explores digital texts and technology in beginning reading pedagogy is limited in scope and does not examine the use of technology in common classroom instructional strategies, such as Modelled, Guided and Independent reading. The premise of this study was that technologies, such as CD-ROM storybooks, electronic readers, and so on, make their own literacy demands that include and go beyond reading print presented in a linear format. It followed then, that the reading demands of new technologies might be addressed in reading instruction in a similar way to the teaching of reading hard-copy, print-based texts. This study sought to build on research such as Hill's (2004) and explore the types of technology used specifically in reading groups, and how they are used in modelled, guided and independent reading activities. It also sought to explore teacher beliefs about the role of technology in reading groups, particularly regarding explicit teaching.

Study design

The study focused on Kindergarten, Year 1 and Year 2 teachers in regional Australian schools. It utilized a multi-method design, employing qualitative and quantitative methods through the use of a survey, classroom teacher observation and semi-structured interviews. The survey aimed to investigate teachers' use of technology in reading groups, as well as their beliefs about using technology in reading groups. Classroom observations and semi-structured interviews were also conducted with teachers who were identified as exemplary at incorporating technology in reading groups. The purpose of the classroom observations and interviews was to ascertain the ways in which 'expert' teachers use technology in their reading groups, and compare exemplary practice with the practice described by surveyed teachers.

The survey had two main sections. The first section was designed to determine the types and of hardware and software teachers used during reading groups and the frequency of usage for each technology. This section also aimed to identify how technology was used in the modelled, guided, independent (MGI) learning cycle, as advocated by the New South Wales English Syllabus support material (New South Wales Department of School Education, 1997). The survey asked participants to indicate the technology used during different kinds of reading group activities (Modelled, Guided, Independent) and with which group configurations (whole class, small groups, individuals). Using a series of grids, participants were asked to identify hardware and software (y-axes) used with their students during reading groups, and nominate the reading group activities and class groupings (x-axes) used with each. Participants were also asked to rate the frequency at which they used technology during reading groups on a six-point scale. Participants were provided with a list of software, as well as the opportunity to record other software not listed. Open questions were also asked regarding the software and hardware that was perceived as most useful and why and the technology that is used most often and why. The second section was comprised of both open and closed questions to investigate participants' beliefs about technology in reading groups. Open questions were used to elicit participants' perceptions of the barriers of, and benefits to, using technology in reading groups. Closed questions were in the form of seven-point scales, used by the participants to rate the degree to which they agree with eight statements regarding teaching with and about technology. The grids and point scales were selected as quick and easy means to elicit data from busy teachers. Qualitative questions were included to provide more depth to the quantitative data.

Teachers who were identified as exemplary at using technology in reading groups were visited, and a literacy session was observed that incorporated reading groups and technology. Observations recorded the way in which technology was used during the session. Following on from each observed session, a semi-structured interview was conducted that explored the use of technology during the observation, as well as during reading groups in general. The interview schedule was based on the survey sent to teachers. The interview allowed in-depth exploration of the role technology plays in literacy learning and teaching in the exemplary teachers' classrooms.

The survey was sent to all primary and central school principals (n=200) in two rural school districts. Follow up contact was made with schools in an effort to improve the response rate. School district literacy consultants were asked to consider the teachers they work with and nominated teachers they believe are exemplary classroom teachers at using technology in reading groups. School and teacher participation was voluntary. In total, 36 participants completed the survey, and two exemplary classroom teachers were observed and interviewed.

Data analysis

The survey data was coded to facilitate a number of analyses, then analysed using the Statistics Package for the Social Sciences. Scale responses to closed questions were given nominal scores. Analysis of open question responses and semi-structured interviews utilized conventional content analysis (Hsieh & Shannon, 2005). Open question responses were coded manually, searching for key words and terms, and comparing and contrasting responses to search for patterns. Coded data was then entered into the Statistics Package for comparative analysis. Field notes and interview transcriptions were coded manually, again searching for keywords and terms. They were then compared with each other, searching for similarities and differences. In the second phase of data analysis, the data from the interviews and classroom observations were compared and contrasted with the survey data.

Discussion of findings

Approximately 60% of survey respondents indicated they used technology in reading groups (n=22). Of the respondents who used technology, 10 teachers used it once a week or less. The technology used in surveyed teachers' reading groups included computers, printers, digital cameras and scanners. Sole use of computers was reported by one third of respondents. The 10 survey respondents who used computers all did so with small groups or individual students. Five of these respondents' students only used computers independently of the teacher, with none of the respondents reporting computer use during modelled, guided and independent instruction. Digital cameras were mostly used with whole classes and small groups during modelled and guided instruction. In contrast, the exemplary teachers explored a wider range of technology, including video cameras and data projectors, and used the MGI learning cycle in its entirety.

Software selection and usage

Surveyed teachers indicated they based software selection on an application's ability to develop or reinforce skills and match with other classroom activities, as well as its ease of use and its age appropriateness. The main benefits identified for using technology in reading groups were student enjoyment and the ability for students to both work independently and be individually catered for. On the other hand, both visited exemplary teachers emphasised their selection of software as being based on the pedagogical soundness of the applications. It was selected to enhance educational outcomes for all students, support classroom learning, improve self-esteem and increase student self-efficacy.

Surveyed teachers used a variety of software with their students, including electronic readers (i.e., *PM Readers*) and CD-ROM stories, word processors, drill and practice applications, games and the Internet. The most regularly used were applications that were seen as useful to reiterate other classroom activities and develop skills. The majority of usage occurred with small groups and individual students working independently, and almost all respondents indicated the most popular and

regularly used software (electronic readers) was accessed in this manner. Some respondents used a combination of guided and independent instruction, while combining all components of the MGI learning cycle was rarely reported (see Table 1).

Table 1
Frequency of software usage, in terms of class groupings and MGI learning cycle components.

	<i>Modelled, Guided Independent (MGI) learning cycle component/s used</i>						
	<i>M Only</i>	<i>G Only</i>	<i>I Only</i>	<i>M & G</i>	<i>M & I</i>	<i>G & I</i>	<i>M, G & I</i>
Electronic readers (total users=16)							
- <i>Small group &/or individuals</i>		1	7		1	6	1
CD ROM storybooks (total users=12)							
- <i>Small group &/or individuals</i>			8		1	3	
Word processors (total users=11)							
- <i>Small group &/or individuals</i>			4		1	2	1
- <i>Whole class</i>						1	
- <i>Whole class, small group & individuals</i>					1		1
Drill and practice (total users=10)							
- <i>Small group &/or individuals</i>			4		1	4	1
Games (total users=10)							
- <i>Small group &/or individuals</i>	1		5			2	
- <i>Whole class</i>	1					1	
Internet (incl. email) (total users=8)							
- <i>Small group &/or individuals</i>	1		1			4	
- <i>Whole class</i>	1						
- <i>Whole class & individuals</i>	1						

The visited exemplary teachers used the MGI learning cycle with all groupings to teach about and with new software. Together, they explored a wider range of software and text types than their surveyed colleagues, including a wide variety of open-ended software ranging from word processing and the Internet to multimedia presentation and video editing software.

Barriers to using ICT in reading groups

All but three surveyed teachers (n=19) commented on barriers to using ICT in reading groups. These comments focused on a lack of adequate computers and software, classroom management issues and a lack of teacher time to learn about and set up new software and assist students. Inadequate student skill levels were also noted. One of the visited exemplary teachers concurred that her main barrier is outdated and malfunctioning hardware. However, she reported repairing faulty hardware herself and maintained that the computers in her classroom are "... still a lot better than anybody who's got anything at home". The other teacher identified an ineffective network as being her biggest barrier. Both exemplary teachers identified a variety of strategies used to optimise learning experiences for students, including using the MGI learning cycle, breaking new activities and skills into easily learned chunks, creating and utilising classroom experts, cross-age and peer tutoring, teaching assistance and daily use of easy to use technology across curriculum areas.

Beliefs about technology use

The visited exemplary teachers use the entire MGI learning cycle during reading groups to teach students how to use new software and technology. While 18 surveyed teachers agreed with the statement "I *explicitly* teach my students how to use new software during reading groups", 5 reported employing only *Independent* activities and 2 reported using *none* of the MGI components. Twenty teachers agreed with the statement "I *explicitly* teach my students how to use new hardware during reading groups". Seven of these teachers reported employing only *Independent* activities, three reported using *none*, and five used a combination of *Guided* and *Independent* activities when using computers in reading groups. Only two surveyed teachers who report they explicitly teach how to use new software and/or technology in reading groups report using all components of the MGI learning cycle to do so (see Table 2).

Table 2

Frequency of MGI learning cycle components used by teachers who agree with statements regarding explicit teaching

	<i>Modelled, Guided Independent (MGI) learning cycle component/s used</i>							
	<i>M Only</i>	<i>G Only</i>	<i>I Only</i>	<i>M & G</i>	<i>M & I</i>	<i>G & I</i>	<i>M, G & I</i>	<i>None</i>
I <i>explicitly</i> teach my students how to use new software during reading groups	1		5		1	7	2	2
I <i>explicitly</i> teach my students how to use new hardware during reading groups		1	7	1	2	5	1	3

Many surveyed teachers agreed there is a special type (n=15), or special types (n=15), of literacy needed to use technology. All but one teacher who agreed there is a special literacy, or literacies, also indicated they explicitly teach these literacies. The exemplary teachers strongly agree there are many specific literacies associated with using ICT, and they cited several including the demands of general computer terminology, software specific terminology, visual literacy including interpreting symbols and navigating, the conventional language demands of software, and a literacy described as 'not the ability to read ... [but] being willing to have a go and not worry about making mistakes and blowing the machine up ...'.

Conclusion

Limited inferences can be made by this study, due to the relatively small number of participants (n=36) and the self-reporting nature of the survey. However, trends in the data were still apparent. Students of surveyed teachers were typically encountering electronic readers and drill and practice games, mostly as a small group or individual, independent activity. That software is mainly seen as useful for skill development and reiteration of other classroom activities, often used independently, concurs with Turbill's (2001) findings and indicates a disregard for new and emerging literacy artefacts. Consistent with Lankshear and Knobel's (2003b) concerns, it appears surveyed teachers incorporate software and new texts into traditional reading group literacy practices but do not adequately address the new literacy demands of these artefacts. Rather than simply viewing technology as a skill development and practice tool, teachers need to treat new and emerging digital texts, such as the frequently used electronic readers and CD-ROM storybooks, as texts in their own right, and address the multimodal demands of these digital texts in literacy classrooms. Furthermore, other new and emerging texts need to be explored in classroom activities.

The visited exemplary teachers viewed technology use as an integral part of literacy, and used the MGI learning cycle to teach students about and with new texts and technology. On the other hand, very few of the surveyed teachers who claim they are explicitly teaching how to use new software and technology in reading groups are using all the MGI learning cycle components to do this. Approximately one-half of these teachers indicated their students *only* engaged with technology in reading groups during Independent activities, or not during Modelled, Guided or Independent activities at all. Arguably, these teachers are *not* explicitly teaching their students the skills and knowledge needed to use new literacy artefacts during reading groups. Some explicit teaching may occur as students work independently, for example, when teachers assist students on an ad hoc basis. However, the systematic explicit teaching needed to address the literacy demands of new software and technologies cannot adequately occur when students only work with these in independent learning situations of the teacher. This lack of explicit teaching again indicates neglect for the literacy demands of new and emerging literacy practices identified by many researchers (Lankshear & Knobel, 2004; Merchant, 2008; Unsworth, 2008; Walsh, 2007).

The barriers to using technology identified by exemplary and surveyed teachers reflect those identified by teachers in Turbill's (2001) study. Issues relating to working hardware and teacher time seem perennial. In addition, surveyed teachers also reported a lack of student skills and classroom management as issues. To combat these issues, the exemplary teachers utilized a range of strategies, with explicit teaching using all parts of the MGI learning cycle central to success. It appears many issues identified by surveyed teachers might be overcome using these methods, but further exploration of the impact of explicit teaching in addressing non-hardware issues in regular literacy classrooms is needed to support this finding.

Many literacy researchers agree on the need to address new literacies in literacy pedagogy (Lankshear & Knobel, 2004; Unsworth, 2008; Walsh, 2007). Indeed, the New South Wales English Syllabus includes outcomes addressing new literacy demands, such as those placed upon us by technology and digital texts (Board of Studies New South Wales, 2007:28-35). That many surveyed teachers agreed with the notion that new literacies exist is comforting, but there is more work to be done to ensure all teachers agree. It is also necessary to ensure teachers address the gap between the treatment of hard-copy print-based texts and technology-mediated texts. It is, evident in this study, between how conventional and that digital technology-mediated texts are at best under-utilised in the literacy classroom reading groups. New Technology and technology-mediated texts need to be addressed in ways that legitimises the out-of-school literacy practices of young, techno-savvy students, and that equip all students with the skills and knowledge needed for their adult lives after school (Sutherland-Smith, 2002). It is also vital to ensure all students engage with technology-mediated texts and technologies at school, so that the division of technology usage evident even prior to coming to school does not result in student literacy regarding new texts and technology being stratified along social-class lines as conventional literacy attainment has been.

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