A Response to Criticism and Challenge: Early Literacy and Numeracy in Aotearoa / New Zealand

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Abstract
The Education Review Office (1998, 2000) has criticised the early childhood sector as not focusing sufficiently on teaching or assessing literacy and numeracy. Early childhood education values play-based, integrated learning environments that build on children’s interests, yet agrees that literacy and numeracy outcomes are desirable. Consistent with Te Whaariki’s sociocultural underpinnings, ways in which literacy and numeracy occurred in one kindergarten are discussed. Greater emphasis on documenting literacy and numeracy within a sociocultural curriculum can enhance the pedagogy and philosophy of early childhood education, alleviate the concerns of ERO and meet societal expectations.

Criticisms and Challenges
A sociocultural perspective of knowledge incorporates the beliefs and values of a culture (Case, 1996). Western society values literacy and numeracy as delivering educational, social and economic benefits for individuals and societies (Bempechat & Drago-Severson, 1999; Te One, 1999). In Aotearoa/New Zealand, literacy and numeracy are a focus of many current educational initiatives. In accordance with this priority, the Education Review Office (ERO) (1998) has criticised the early childhood curriculum, Te Whaariki, (Ministry of Education, 1996) as not being sufficiently concerned with preparing children to have appropriate literacy and numeracy knowledge upon school entry. Te Whaariki was not designed to and does not prescribe subject content. Within Te Whaariki, the potential for literacy and numeracy is apparent within its holistic approach, but perhaps only explicitly visible within the communication strand, one of five strands woven together to guide curriculum planning.

More recently, ERO (2000) criticised some methods of assessment in early childhood education in the areas of literacy and numeracy. This report also noted that a potential effect of emphasising literacy and numeracy is a consequent focus
on formal academic learning that is inappropriate in early childhood education. Early childhood pedagogy values constructs such as child-centred, holistic, play-based integrated curriculum. Yet, these constructs might be used to exclude specific teaching and learning of content knowledge and appear to leave teachers without clear guidelines for content selection in curriculum. Certainly, ERO's "almost deity status" (Te One, 1999, p. 31) means that the early childhood community must take these criticisms, and the challenges they engender, seriously. This commentary draws on a case study of a kindergarten to examine what might constitute literacy and numeracy experiences in early childhood and to respond to the concerns raised.

Literacy and Numeracy in Early Childhood Education

Literacy, simply defined, is a tool people use to understand and negotiate the world. Literacy integrates viewing, speaking, listening and critical thinking with reading and writing (Australian Early Childhood Association, 1999). The ability to read and use written information to communicate appropriately in a range of contexts empowers people to communicate and gain access to knowledge. From a sociocultural perspective, literacy events emerge from children's daily experiences in homes and communities. Parallel to this, research currently highlights incorporating skills such as phonological and phonemic awareness within these events (Cullen, 2002). The term "emergent literacy" emphasises continuities in literacy development and characterises young children's early efforts to read and write. A wide range of authentic literacy experiences prepares children for purposeful learning of reading and writing at primary school.

A useful definition of numeracy is an ability to use mathematics with accuracy and confidence (Headington, 2001). Copley (2000) uses the term "mathematical literacy" to describe recognition of numbers, mathematical signs and symbols. Copley describes the child as being at "the centre of the sociocultural context" (p. 169) if the programme takes children's experiences and interests into account, allows children to make choices and contribute ideas about mathematics, and incorporates resources and games from various cultures. In this way, young children develop much intuitive and informal mathematical knowledge because of their everyday experiences. However, Peters (2001) argues that a "maths is everywhere" approach should not be used to excuse teacher planning and involvement as this may be counterproductive to children's effective learning of numeracy. Providing guidance to teachers about numeracy in a holistic learning environment, Davies and Savell (2001) suggest that counting experiences require more emphasis than other numeracy experiences to foster successful later mathematical learning.

A concern raised by the early childhood community is that where subjects such as literacy and numeracy are emphasised, the effect will be that of a "push-down" curriculum. This means that early childhood programmes may appear similar to primary school programmes in utilising more formal approaches to content and pedagogy. Parents' wishes for a more structured, academic curriculum have been
reported in Aotearoa/New Zealand (Cherrington, 2001; Hedges, 2002; McLeod, 2002). Research revealing declining literacy and numeracy knowledge in various western countries has also led to pressure for children to be taught formally earlier. Yet, research so far has not demonstrated long-term gains from such approaches. Marcon (1999) found that what appeared to be academic advantages upon school entry were soon washed out by school experience. In her follow-up study, Marcon (2002) ascertained that children who had experienced academic preschool curricula gained lower grades in their sixth year of schooling compared with children who had attended play-based, child-initiated early childhood experiences. Other research specifically on literacy also supports that later achievement is lower for children taught didactically than for children who have learned in a play-based environment (David et al., 2000).

While early childhood internationally defends its child-centred, integrated philosophy, there is also a feeling of vindication in the local early childhood community from the latest results of the longitudinal study known as the Competent Children project (Wylie, Thompson & Lythe, 2001). This project has measured the impact of early childhood experience on children’s school achievement. At age ten, alongside other influences such as maternal education levels, and emphasising quality pedagogical interactions such as including some cognitive content to develop children’s thinking and theorising, the length of early childhood experience made the most long-term impact on mathematics and literacy competencies.

Clearly then a child-centred pedagogy does have the potential to foster literacy and numeracy. Yet, Te Whāariki, although mentioning literacy and numeracy, does not specify these or how to teach them through play-based experiences evolved from children’s interests. Teachers are perhaps caught in a dilemma about whether or not fostering children’s construction of knowledge is a priority in the curriculum. Examination is therefore required of ways in which children construct knowledge of literacy and numeracy in early childhood settings and how these might be documented to respond to ERO’s challenges.

The following discussion draws on findings from a case study (Hedges, 2002). Oaktree Kindergarten is a half-day sessional early childhood service in Auckland. The researcher spent seven weeks attending morning sessions for 45 four-year-old children with their three teachers, and also participated in an excursion to Kelly Tarlton’s Antarctic Encounter and Underwater World, an aquarium in Auckland. This paper draws on group interviews with children, teachers and parents, curriculum documentation, and fieldnotes of learning and teaching interactions. The case study provides some insight into ways literacy and numeracy happen in a setting that bases its programme on Te Whāariki.

**Early Literacy and Numeracy at OakTree Kindergarten**
Consistent with sociocultural approaches, teachers described how literacy occurred as part of the regular learning experiences available that teachers and children participated in together. Providing access to a range of media, for
experiences and equipment available in the learning environment for children to self-select during the kindergarten session, was not documented in itself. Nor were the ways that these experiences lead to children learning literacy and numeracy necessarily obvious to those without the professional knowledge and experience of qualified early childhood teachers.

The teachers at Oaktree Kindergarten were all degree-qualified, two had completed secondary education to form seven and they had a range of teaching experience from six months to ten years. Their professional knowledge was likely to be more extensive than many teachers in what remains a sector in Aotearoa/New Zealand where qualified teachers are scarce. Yet, they expressed some uncertainty about their confidence in their subject knowledge. This finding supported Anning and Edwards’ (1999) contention that teachers’ confidence in their subject knowledge is crucial to maximising learning. In addition, some writers suggest that many teachers do not find it easy to extend children’s numeracy abilities within a play-based curriculum. For example, Barber (1995) suggests that discovering the capacities of measuring jugs in water play is a common activity, but that without teacher support there is no guarantee that a child will focus on which holds the most water and why. Haynes (2000) claims that early childhood teachers need an abundance of mathematical subject knowledge to teach confidently within the holistic learning environment of early childhood contexts. Similarly, Ure and Raban (2001) found that teachers were unsure of their role in relation to early literacy and were eager to improve both their knowledge and practice. These perspectives may provide support for ERO’s concern about the adequacy of children’s early literacy and numeracy experiences.

Children revealed their content knowledge in ways that illustrated that children’s knowledge is not discipline-specific. The following example crosses the boundaries of literacy, numeracy, geography and technology. The children discussed how the bus driver would know how to get to Kelly Tarlton’s, eventually focusing on discussion of maps. Two children proceeded to draw maps that held personal meaning to them. One drew “treasure maps” and later wrapped parcels of collage materials to be found at the treasure sites. Another drew hers of the route to Kelly Tarlton’s and took it on the excursion. One teacher, Mary, recorded a conversation that occurred on the bus with the child about her map. She described the major landmarks passed during the bus journey and pointed to where they featured on her map. Consideration of children’s integrated learning such as this example reveals how complex documentation that highlights literacy and numeracy in early childhood might be. While currently there is limited research in this area, Rodger’s (1995) study of a junior primary classroom demonstrated that while children focused on activities emphasising geography, skills of literacy and numeracy were incorporated. Rodger argues that a shift in emphasis to subjects in a curriculum therefore does not necessarily detract from children’s integrated learning. As Peters (2001) posits in relation to numeracy, the challenge of an integrated curriculum is to enhance and highlight knowledge while supporting an orientation towards learning.
The use of "small group teaching" at the beginning of each kindergarten session was being trialled during the research period. Each teacher had fifteen children in her group and planned these sessions based on children's interests. Early literacy was highlighted in the majority of these sessions, for example, inclusion of songs that used repetition and rhyme and books that utilised techniques such as alliteration to stress phonological and phonemic skills. Numeracy was evident less frequently. A notable exception was when Shaina's group cooked pikelets. This experience incorporated many literacy and numeracy concepts. However, these sessions were planned and evaluated informally and were not documented. Therefore, teachers' and parents' positive impressions of them were not supported by evidence that organisations such as ERO could access. While the researcher was able to observe and document these interactions, perhaps because teachers were actively involved in teaching fifteen children at these times, documentation of children's learning, that might include examples of literacy and numeracy, was not undertaken.

Parents expressed beliefs in children's willingness to "learn" as being something different to "play", and concern that their children were not disadvantaged academically. Despite such misunderstandings about early childhood pedagogy, some parents believed that the foundations of literacy and numeracy knowledge were occurring at the kindergarten. The teachers concluded that early childhood teachers must take responsibility for articulating their expertise to facilitate clearer understandings of early childhood pedagogy. In relation to ERO's specific concerns, similar articulation and documentation of ways that children construct knowledge of literacy and numeracy is required.

Conclusion: A Response

Criticisms of early childhood education have posed challenges to the sector. It is possible that Te Whaariki's under emphasis on content is a contributor to ERO's concerns. Nevertheless, the case study of Oaktree Kindergarten validates existing practices in relation to the teaching and learning of literacy and numeracy. Children's construction of early literacy and numeracy occurred through authentic, purposeful and meaningful experiences, within co-constructive pedagogical relationships with knowledgeable teachers and peers, in a play-based, integrated learning environment. However, these outcomes were underemphasised in curriculum documentation.

Furthermore, contemporary approaches to assessment in early childhood may not incorporate documentation of content outcomes. For example, a "learning stories" approach (Carr, 2001a) focuses on children's dispositions of curiosity, involvement, perseverance, contribution and taking responsibility. Dispositions related to subject learning, for example, the disposition to think mathematically (Anning & Edwards, 1999), may not be emphasised in current implementation of learning stories. Likewise, teachers could view children as possessing learning orientations such as "being nearly five" (Carr, 2001b) to highlight literacy and numeracy more effectively. In relation to numeracy, Parsonage (2001) analysed learning stories in
her kindergarten for links to the mathematics curriculum children study at primary school. Her findings demonstrated the mathematical potential in each learning story. She also identified that it was teacher knowledge, enthusiasm and confidence that determined how this potential was realised in children's learning. Parsonage asserts that greater provision of professional development may be required to ensure that teachers can maximise children's content learning within a dispositions-based approach.

In a sociocultural perspective of curriculum and pedagogy, the philosophy of a play-based, integrated approach to children's learning is compatible with construction of content knowledge. Currently, it is likely that literacy and numeracy form part of the "hidden curriculum" of high-quality early childhood education. That is, the curriculum that children actually experience but that largely goes undocumented. Further, while there is potential throughout Te Whariki to recognise literacy and numeracy, the amount and depth of content is the responsibility of teachers, and relies on teachers' professional knowledge. In this regard, Cullen (2002) highlights the need for teachers to have both a knowledge base of literacy and understanding of the sociocultural underpinnings of Te Whariki in order to teach effectively. The rhetoric of integrated, child-centred and holistic approaches should not absolve teachers from the responsibility to be knowledgeable about and incorporate subject content knowledge in order to extend children's learning and make links to curricula children experience at school.

Consequently, teachers' professional knowledge and continued professional development will determine the extent of literacy and numeracy outcomes consistent with the implementation of Te Whariki. Most significantly, highlighting and documenting literacy and numeracy learning may assist in describing reasons for findings such as those of Marcon (2002) and Wylie, Thompson and Lythe (2001), that learning and teaching enacted by knowledgeable professionals, can lead to long-term academic outcomes for children. It may also alleviate the concerns of ERO that reflect societal beliefs and expectations about the importance of literacy and numeracy. Early childhood education could then resist the pressure for formal learning on the grounds that literacy and numeracy can be constructed effectively, and with long-term results, within existing curriculum and pedagogy. Present moves to increase the numbers of qualified teachers in the early childhood sector and encourage collaboration between the early childhood and primary sectors (Ministry of Education, 2002), provision of sustained in-depth professional development and provision of non-contact time to undertake professional responsibilities such as documentation, are necessary actions. These will contribute towards increasing the professional knowledge teachers require to implement Te Whariki successfully and ensure that children have appropriate literacy and numeracy experiences prior to school entry, documented to the satisfaction of stakeholders.
References


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ABOUT THE AUTHOR
Helen Hedges is the early childhood practicum co-ordinator in the Faculty of Teacher Education at Auckland College of Education. Her M.Ed (Early Years) thesis studied subject content knowledge in early childhood curriculum and pedagogy. It argues that within the existing play-based and integrated philosophy, children’s subject knowledge can be highlighted and utilised to extend their learning and interests by teachers who are confident in their own subject knowledge. Helen is currently exploring possible PhD topics in the sphere of teachers’ professional development.