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Early childhood science education: do Australian publishing trends represent world publishing trends?

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A literature search of both Australian early childhood journals and Australian science education journals provides a compelling picture of science education in Australian early childhood in the recent past and the previous 40 years. Whilst a previous review of the literature found that there were concerns over the early childhood educators' confidence in teaching science, particularly physical sciences, current research indicates that this problem is still prevalent. The historical perspective also found that there was a distinctive approach evolving in early childhood science education, however further research into the place of science in the cognitive domain of early childhood was required. The more recent literature search found that as an area of investigation, early childhood science is still a neglected research area and there is still much scope for the development of theories and analysis of early childhood science education. The literature search was undertaken scanning for titles which included science education and early childhood in several Australian early childhood journals and Australian science education journals, although it is acknowledged that some articles may have been sent to international journals.

Key words: early childhood, science education, trends

Background Introduction

Over the last forty years, early childhood settings have increased in scope and number as more families with young children (birth to 5yo) return to work. In Australia, pre-school centres were available well over 60 years ago, although these tended to be run by church institutions and were only for a few hours each day. In today's world, however, we have long-day care centres, pre-school centres and kindergartens, all with slightly differing management regimes to suit most families with young children. The importance of early childhood has been brought to the forefront of government policy and practice in more recent years. Research into the early years of childhood in the last decade has highlighted the importance of quality early childhood care. In the first five years of their lives, children have developed most of the brain capacity they need. Catherwood (1999) indicated that considerable brain growth occurs during infancy and that significant learning also occurs in this time.

With early childhood centres becoming responsible for the development of the child, educational aspects were written into frameworks of practice for early childhood centres and staff. Science education, seen as children investigating and learning about the world around them, is an essential element of a child's development. This paper looks at the way science education has been portrayed in early childhood by reviewing literature in Australian journals in the last 10 years and comparing it with an earlier review undertaken by Marilyn Fleer (2001).

Methodology - Literature Review

A literature review was undertaken looking at significant journal publications in Australia, Teachers' Journals and major conference presentations. The Australian Journal of Early Childhood (previously the Australian Pre-school Quarterly) first published a science education article in 1969. The journal, Research in Science Education, was also established 39 years ago. Other journals included: Teaching Science and the Australian Research in
Early Childhood Education. An electronic search was conducted looking at all contents’ pages printed in the suggested time period. A key word search proved to be not effective, as often the key words, such as early childhood, pre-school and science education were not in the titles. Instead, the abstract for each result was read to determine if the published article was indeed about early childhood science education in Australia in the past 10 years.

Results

In a previous study of science education in early childhood, Marilyn Fleer (2001) reviewed 40 years of research and came to a number of conclusions. She found that there had been an evolution in thinking over the time which led to important information for early childhood educators. Firstly, there were grave concerns over the science understandings of early childhood educators and the consequence of this for assisting young children with science ideas. She highlighted the disjunction between science education in general and the developing style of science education in pre-school settings. Finally, Fleer (2001) indicated that there needed to be significant theorising and analysis of early childhood science education practices.

In the more recent review, looking over the last 10 years, again a number of observations have been made. Firstly, at a practical level, there are relatively few research articles written about science education in early childhood.

Table: Number of published articles on early childhood science education.

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<tr>
<td>Total number of papers</td>
<td>270</td>
<td>114</td>
<td>271</td>
<td>280</td>
</tr>
<tr>
<td>Papers on early childhood science education</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Percentage of content given to early childhood science education</td>
<td>2.2%</td>
<td>2.6%</td>
<td>1.5%</td>
<td>5%</td>
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*Limited by access to on-line journal titles.

**The time frame was limited so that the total number of articles accessed was similar to the other selections.

The articles varied in content and purpose. Some related to early childhood educators’ science understandings and professional learning, such as Dawn Garbett’s article on Science education in Early childhood Teacher Education: Putting Forward a Case to enhance Student Teachers’ Confidence and Competence (Garbett, 2003). Yet others related to specific case studies of children working in science in pre-school centres, such as Preschool Children’s Explanations of Plant Growth and Rain formation (Christidou & Hatzinikita, 2006). There were a few which related to cognitive development of children, Tracing young children’s Scientific reasoning (Tytler & Peterson, 2003). Others were mixed topics which included gender and research methodology. The journal Research in Science Education devoted an entire edition in 2003 to early childhood science. Three of the articles were from New Zealand and the United Kingdom, and while they did not necessarily reflect the
situation in Australia, the research topics were sufficiently generic to allow transference of primary ideas.

**Conclusion & Implications**

In undertaking this small research project, I was dismayed with the lack of published articles about early childhood science education. This may reflect the fact that in Australia, early childhood has just recently gained prominence as a government priority area. It has increased status and increased funding. Research in science education in early childhood science could be considered a developing area. The other possible explanation is that whilst it is still a relatively young research area, the journals may be reluctant to increase the number of articles which it publishes in early childhood science education. A further possibility is that science education within pre-schools is not given the importance it deserves and therefore, research is limited. Does the research publication rate in Australia represent a similar trend in Europe or the rest of the world? If so, then this presents a significant issue.

So, as science educators, what do we do about this dilemma?

We all know that science education is important – right from the start of life children begin investigating the world around them. We need to ensure that our pre-school educators understand the value of science education for the young child and work towards providing them with comprehensive experiences in science. We need to work with our student teachers and community members to increase their knowledge of what science education is and its relevance for children. Finally we need to ensure that our research is rigorous and our writing is of high quality so that journal editors select our papers for publication and word about early childhood science education begins to spread within the science education research community.

**Bibliography**


