THE TREATMENT OF SCIENCE DISCIPLINE KNOWLEDGE IN PRIMARY TEACHER EDUCATION

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ABSTRACT

Whilst there is general agreement that primary teachers have a rather limited understanding of science, as Symington and Mackay (Note 1) have shown there is no universally accepted view amongst teacher educators in Victoria about the steps that need to be taken to improve their subject matter competence in science. This paper addresses the issue by taking a topic which is widely included in primary science programs, namely floating and sinking, and asking what knowledge primary teachers should have to enable them to handle the topic in a primary classroom in a way consistent with constructivist ideas. The paper will also address the issue of how that knowledge could be assessed.

RESEARCH INTO CHILDREN'S IDEAS ABOUT FLOATING AND SINKING

Biddulph and Osborne (1984) have conducted and published research into children's ideas about floating and sinking which has provided valuable insights into pedagogical issues associated with introducing these concepts at primary school level. They developed a procedure, utilising a set of pictures representing instances (Figure 1), which facilitates exploration of children's ideas. Biddulph and Osborne asked students to examine each of the instances and say whether, in the way they thought about floating, the object portrayed was floating. This procedure, and responses to it, provide a vehicle for reflection on the way science operates and how this should be taken into account when dealing with primary teacher education students.

REFLECTIONS ON THE NATURE OF SCIENCE

The framework for the reflection on this issue will be provided by five questions:

* Does nature contain a definition of floating which can be uncovered through appropriate experiences?
* How does science deal with an idea such as floating?
* Is there a single explanation for a phenomenon such as floating?
* Can science always provide an answer to a question?
* When a "better" explanation is suggested do scientists readily accept it?

Question 1: Does nature contain a definition of floating which can be uncovered through appropriate experiences?
Fig. 1: Drawings used to explore individuals' concept of floating.