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**Lowrie, Tom; Owens, Kay**

**Making connections with space and measurement.**

Owens, Kay et al., Research in mathematics education in Australasia 1996 - 1999. , (ISBN 0-646-39394-4). 181-214 (2000).

Tom Lowrie and Kay Owens illustrate how concept development cannot be separated readily from either the learner or the context of learning. While the emphasis of their chapter on Making Connections with Space and Measurement is on concepts in Space and Measurement, nevertheless its focus on processes is relevant to other areas of mathematics. Representation of three-dimensional and two-dimensional shapes was a key issue in a number of studies. Representations showed how students were thinking, and could be used for encouraging learning. Some studies have emphasised a particular theoretical perspective, with several studies critiquing van Hiele theory and making suggestions for extending it to represent more closely observed data. In this way, aspects of class inclusion, single and multi-property recognition, and relational understanding of properties for higher level students were examined. Another theoretical perspective was the idea of abstraction from physical contexts that represent a complex concept such as angle. A third perspective has been to consider the development of imagery in assisting students in primary school to develop spatial thinking. Several researchers have explored the links between visual and nonvisual processing in problem solving as well as the impact of affective variables, knowledge, and methods of responding to progress in problem solving. The ideas of conjecturing, solving and proving have been closely linked to studies investigating the use of drawings.

*Classification:* G22

*Keywords:* visual processing; nonvisual processing; australasia