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Meaning and mathematics.

Kilpatrick, Jeremy et al., Meaning in mathematics education. Springer, New York, NY (ISBN 0-387-24039-X). 231-260 (2005).

From the book's introduction: This philosophical discussion of mathematical meaning considers the relevance of Pierce's theory of meaning and takes up the discussion of knowledge in terms of "modes of knowing". Thus the active part of coming to know becomes essential. The author disputes the dualism, so carefully elaborated by Descartes, which has been the basis of many interpretations of meaning: that is, a mental entity, a conception belonging to an internal world, has a meaning if it refers to something from the external world. A conception of knowing becomes more complex when knowledge and meaning cannot be thought of in terms of representations and references, but in terms of activity. A dialectic between the subject (the knower) and the object (what one could know about) is the basis for a "double" constructivism where both subject and object will be constructed and reconstructed in a process of coming to know. The author discusses the relationship between the particular and the general, using as an example the relationship between a particular and a general triangle. He claims that mathematical objects do not exist independently of the totality of their possible representations, but at the same time they are not to be confused with any particular representation. Furthermore, he emphasises that a mathematical problem is an objective structure that nevertheless has no meaning apart from its possible representations. In this way, he elaborates on the dynamic relationship between the knowing subject and what knowledge can be about, arguing that one pole in this relationship cannot be described independently of the other. The author brings all these considerations together through an analysis of Pierce's theory of meaning.

Classification: D20 C30

Keywords: meaning; theory of mathematics education; Pierce' theory of learning