

RECENT DISSERTATIONS

KARI SORMUNEN, 2004:

Seventh-graders' epistemic views related to science lessons

University of Joensuu, Department of Education, Finland
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Abstract

The aim of this study was to explore seventh-graders' views on knowledge and their acquisition of knowledge. The pupils' views were examined in the context of six double lessons in physics, where their study focused on the structure and states of matter. The research task was divided into four main research questions (RQ). (1) The pupils' epistemic conceptions were approached from three different perspectives: their own, their teacher's and a scientist's. (2) The pupils' notions related to their epistemic judgement of their own learning were examined, as well as (3) their conceptual understanding of the contexts in question. (4) The composite view of each pupil was correlated with his/her personal conceptions, and these personal epistemic views examined and compared with each other.

The first main result was that developmental theories of personal epistemological belief are not the best for explaining young pupils' epistemic conceptions. It can be claimed that theoretical models of development, in fact, underestimate seventh-graders' epistemic views. In contrast, when such epistemological beliefs are approached in greater detail and with their context taken into account, they can be seen to be structures that consist of epistemic primitives, and thus offer the possibility of a promising and more pedagogically applicable approach.

The 2nd RQ was designed to facilitate the linking of pupils' epistemological conceptions and their metacognitions, both on a conceptual-theoretical level and on an empirical-hypothetical level. The findings of the present study, though preliminary in nature, suggest that epistemic cognitions are in fact separate from metacognitions and that the relating processes are hierarchical in nature. Both processes guide the cognitive processes, but the epistemological processes function at a higher level.

The 3rd RQ has provided valuable insight into pupils' conceptual understanding of the topic under study, an aspect that was also essential for the contextual interpretation of the research. The use of models and modelling as an instructional approach can be claimed to have produced a relatively far-reaching understanding of the structures and states of matter. Combining the pupils' conceptions as parts of their composite epistemic views has also been of value in a methodological sense: few, if any, studies exist in which conceptual understanding has been explored as a part of epistemological beliefs.

The conclusion for the 4th RQ was reached that the composite epistemic views of each pupil were very different. This major finding suggests that, when science is taught, pupils' epistemically different conceptions and their sheer variety also need to be taken into account. This situation should be regarded as a challenging opportunity to examine and re-think the various epistemological ideas and forms. In other words, pupils' epistemological beliefs should be seen not as developmental constraints but as epistemological starting-points and resources for class discussion.

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Contact: kari.sormunen@joensuu.fi

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