FACILITATING THE CONCEPTUAL CHANGE IN MATHEMATICS

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The crucial idea in the conceptual change is the radical reconstruction of prior knowledge which is not very well observed in traditional teaching. The theories of conceptual change (see Vosniadou 1999; Duit 1999; Reiner, Slotta, Chi & Resnick, 2000) define two levels of difficulty in the learning process. The easier level of conceptual change means *enrichment* of one's prior knowledge structure. In this case the prior knowledge is sufficient for accepting the new specific information. The student needs only to add the new information to the existing knowledge. The more difficult conceptual change is needed when the prior knowledge is incompatible with the new information but needs a reconstruction. There seems to be at least two basic kinds of directions for problems in conceptual change. The one is the knowledge and operations which are relevant on a certain domain, but need to be revised on the other. This is the case with the mistaken transfer from natural numbers to the rational numbers. For example the students seem to face considerable difficulties in struggling to sort fractions (Hartnett & Gelman 1998) because of their spontaneous use of the logic of natural numbers. The other kind of problems are the beliefs and conceptions caused by experiences with mathematics. The need to make drastic changes to the prior thinking may not even occur to the students unless the needed change is made very explicit in the teaching.

The purpose of the discussion group is to explore the specificity of the nature of conceptual change in mathematics concept formation (wide conceptual field needed, different representations used etc.), to discuss about the role of prior thinking and to find ways to facilitate this conceptual change.

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