Imagery and Affect in Mathematical Learning

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Traditional views of mathematics as an abstract, formal discipline have tended to relegate visualization, metaphor and metonymy, emotions, and the relation between feeling and mathematical imagination to incidental status. Continuing the discussions begun at PME-24 in Hiroshima and at PME-25 in Utrecht, our primary focus is on imagery, affect, and how they interact: their interplay with natural language, formal notations, heuristics, beliefs, and especially with each other. Representation in learning mathematics includes not only external structured physical configurations, but also internal systems that encode, interpret, and operate on mathematical image and symbol configurations (Goldin, 2002). We have a strong case for the centrality of imagistic reasoning, analogies, metaphors, and images in such representation (English, 1997; Presmeg, 1998). Lakoff and Nunez (2000) even (controversially) seek to recast the foundations of mathematics in terms of conceptual metaphors. Essential roles of affect in encoding information, influencing learning and performance have also been noted and studied (Evans, 2000; Goldin, 2002; McLeod, 1992).

For PME-26, we will extend our discussions on the nature and role of affective and imagistic representational systems in mathematical learning and problem solving. In doing so, we will explore an embodied perspective on perception, cognition, affect, imagination, and reasoning. This issue generated much discussion at PME-25 and participants expressed a keen interest to pursue the topic.

In the first session, we will review the Discussion Group's progress to date, and then continue our discussion on the embodied perspective and other perspectives that participants raise. In the second session, we plan to focus on specific classroom examples of the issues in question and consider some of the difficult points in their empirical investigation. Intending participants are asked to bring along problem-solving data (including videotaped activities and transcripts) in which the group can identify examples of imagery, affect, and especially their interplay.

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McLeod, D. B. (1992). Research on affect in mathematics education: A reconceptualization. In D. Grouws (Ed.), *Handbook of Research on Mathematics Teaching and Learning,* 575-596. NY: MacMillan.

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