DISCUSSSION GROUP: SYMBOLIC COGNITION IN ADVANCED MATHEMATICS

Principal Co-ordinator: Stephen J. Hegedus,
University of Massachusetts Dartmouth, USA

Assistant Co-ordinators: David Tall, University of Warwick, UK.
Ted Eisenberg, Ben-Gurion University, Israel

The study of Symbolic Cognition builds upon the work on representations in mathematics learning and communicating in the classroom (Janvier, 1987; Cobb, Yackel & McClain, 1997). We refer to symbolic cognition as the construction of mathematical signs and symbols and the processes involved in manipulating such objects into meaningful concepts, procedures and representations.

Following our very first meeting of the group at PME25 in Utrecht, rich and varied discussion has continued through the implementation of an on-line email forum.

At PME26, we aim to continue discussion focusing on seven important areas of interest which arose out of preliminary inquiries. These include:

1. The mediation of human experience by purposeful use of symbol systems;
2. The co-evolution of language and symbol systems;
3. The role of orality and literacy in the development and use of mathematical symbols;
4. The inter-relationship of signs and symbols (e.g. the work of Pierce);
5. On producing the symbolic – processes, actions and manipulation;
6. New technologies, new representational structures;
7. Meta-processing – the role of reflection and monitoring in using symbols.

Each day discussion will be led by two or three short and focused presentations of 10 minutes each by members of the group aiming to further concentrate our ideas. Our aim is to generate specific lines of inquiry, which lead to the formation of a working group at the next meeting of PME. We see the group working in small sub-groups, concentrating on some of the main themes already outlined and new ideas deemed important and significant. This set-up will support the formation of special interest groups, which reflect the individual members' lines of expertise in symbolic cognition.

On-going work can be found at the group's website at www.symcog.org.

REFERENCES

Janvier, C. (ed) (1987) Problems of Representation in Mathematics Learning and Problem-Solving. Hillsdale, NJ: Lawrence Erlbaum.

Cobb, P., Yackel, E. & McClain, K. (Eds) (2000) Symbolizing and Communicating in Mathematics Classrooms: Perspectives on Discourse, Tools, and Instructional Design. Lawrence Erlbaum.