GROUP 4
SOCIAL INTERACTIONS IN MATHEMATICAL LEARNING SITUATIONS

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INTRODUCTION

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Evidently, on international conferences one is confronted with a variety of different theories about a topic that appears like the intersection of these theories. Scrutiny as it necessarily emerges in the discussions during our group sessions, however, partly reveals fundamental conceptual differences according to the presumed common topic “social interaction in mathematical learning situations”. Neither the understanding of “social interaction” nor the understanding of what “mathematical learning” might look like was common sense. One of the major results of these group-meetings was the increasing clarity about the different use of same and/or similarly looking concepts. The reference to social and personal constructivism was far to global as to call it a common basis of the papers of this group.

The reader might be aware of the changes of the definitions of similar concepts with regard to

- micro-sociological approaches based on interactionism (Blumer) and ethnomethodology (Garfinkel),
- the theory of didactic situations based on Brousseau’s work,
- system-theory based on Luhman’s approach,
- a theory of situated learning,
- a theory of social interaction as developed by post-Piagetian scientists, and
- a theory of project learning.

Birgit Brandt (Recipients in Elementary Mathematics Classroom Interaction) exposes aspects of participation in elementary (mathematics) classroom interaction. She considers classroom interaction as a multi-party-interaction with more than one “interaction unit” at the same time. Linked to micro-sociological approaches and with
respect to the particular character of her observed classroom she describes reception
roles and forms of parallel interaction in the multi-party-interactions of primary
classrooms.

Jean-Philippe Drouhard (Necessary Mathematical Statements and Aspects of
Knowledge in the Classroom) is interested in the concept of mathematical necessity
and how it emerges in mathematical classroom processes. For this and with regard he
addresses some specific issues like the intersubjectivity of the knowledge, the subject’s
experience of mathematical necessity, and the role of time in order to understand the
“construction” of the necessity of the necessary mathematical statements.

Götz Krummheuer (The Narrative Character of Argumentative Mathematics
Classroom Interaction in Primary Education) presents some results from two related
research projects about processes of argumentation in primary mathematics classroom.
His central research interest is to examine the relationship between the participation of
students in argumentative processes and their individual content-related development
in regular classroom settings. Based on a micro-sociological perspective he describes
the narrative feature of these processes.

Alain Mercier, Gérard Sensevy, Maria-Luisa Schubauer-Leoni (How Social
Interactions within a Class Depend on the Teacher’s Assessment of the Pupils’ Various
Mathematical Capabilities. A Case Study) address from a clinical, mainly
post-Piagetian point of view the issue of the interrelations between the knowledge
acquiring processes and the social interactions within a class of mathematics: a) how
can knowledge determine the kind of social relationship established during a didactic
interaction, and b) reciprocally, how can the social relationship already established
within the class influence one and each pupil’s acquisition of knowledge?

The subject Natalie Naujok’s paper (Help, Metahelping, and Folk Psychology in
Elementary Mathematics Classroom Interaction) is part of an investigation on student
cooperation and its functionality with respect to learning opportunities. Her aim is to
reconstruct on base of micro-sociological theories how students interactively construct
the cooperation-form of helping. These students’ taken-as-shared ideas will be
explained by applying BRUNER’s concept of folk psychology.
Alison Price (It Is Not Just About Mathematics, It Is About Life: Addition in a Primary Classroom) discusses of a classroom session transcript with respect to the question how the teacher uses language and examples from everyday social life to teach the children about addition and at what effect this process of situating the mathematics has on the children’s learning and understanding. At issue is the social nature of learning, as the child tries to make sense both of the mathematics and of their life experiences in this situation.

Catherine Sackur, Teresa Assude & Maryse Maurel (The Personal History of Learning Mathematics in the Classroom. An Analysis of Some Students’ Narratives) examine written narratives of students (high school, university or preservice teachers) about the students’ personal memory on a mathematical subject. The purpose is to reconstruct students’ experience in mathematics and their personal relation to mathematics. The authors relate their results to the concept of “didactical time” as developed in the theory of didactic situations.

Heinz Steinbring (Mathematical Interaction as an Autopoietic System: Social and Epistemological Interrelations) focuses on the problem of what are essential characteristics of mathematical teaching interaction. He uses the concept of “social communication as an autopoietic system” (Luhmann) as one general theoretical perspective and combines this approach with an epistemological analysis in order to clarify some characteristics of mathematical interaction in contrast to general social interaction.

Marie Tichá and Marie Kubíova contribution (On the Activating Role of Projects in the Classroom) deals with the approach of project learning. They present concrete examples from school practice in order to show the areas in which their approach of project learning was profitable for students. They identify main obstacles for implementing project-learning in classroom, and develop the future direction of their research.