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ABSTRACTS

**Abboud, Maha ; Coles, Alf. *The Practice Theme in Mathematics Education: Development of an English-French Collaboration on the Role of Theories***

**Abstract.** In this introductory article, we describe how the Special Issue came about, as a result of three years of collaboration. We show how this collaboration developed with a focus on the role of theory. We draw out themes across the individual papers, making use of the concept of ‘boundary objects’ that have allowed the comparison and enrichment of our different perspectives. We suggest that the work of bringing together researchers, from different traditions and on a sustained basis, is more important now than ever, in a context in which policy makers are increasingly looking at ‘solutions’ to problems in education from the other, seemingly more successful, countries (e.g. as measured by international comparison tests). We conclude with questions for further research, both for our particular collaborative group and more widely.

**Jaworski, Barbara ; Lerman, Stephen ; Robert, Aline, Roditi, Eric with the collaboration of Bloch, Isabelle. *Theoretical Developments in Mathematics Education Research: English and French Perspectives in Contrast***

**Abstract.** This article traces the development of theoretical perspectives in the English and French mathematics education research cultures from the 1960 and 70s to the present. The main parts of the article are the separate accounts of development in the two domains. The two areas are presented separately since they are very different both in terms of what is in focus at different times and in terms of the theories originated, developed or appropriated. The place of a priori mathematical analysis (i.e. analysis of the mathematics to be taught, prior to teaching) seems a key difference, beyond the institutional and cultural differences. The final part of the paper draws attention to key areas of difference between the two domains and suggests key questions and issues in which there is common ground albeit addressed from the differing perspectives and cultures.

**Abboud, Maha ; Goodchild, Simon ; Jaworski, Barbara ; Potari, Despina ; Robert, Aline ; Rogalski, Janine. *Use of Activity Theory to make sense of Mathematics Teaching: a dialogue between perspectives***

**Abstract.** This paper examines the interactions between teachers’ decisions, discourses and acts, and the intended students’ learning. The focus is theoretical and methodological as it attempts to exemplify theoretical perspectives in studying mathematics teaching in its complexity. It takes into account, together or separately, the overall setting: sociocultural and institutional and the epistemological point of view on mathematics and its teaching in class. For some of the authors, the study of teacher activity in relation to students’ mathematical activity, and affective and social needs has been the focus of their research for many years, using different theoretical constructs and empirical data. As for the others, their research in the same area was focused more on the presumed cognitive needs, in relation to the practices and the mathematics at stake. The article reveals that Activity Theory has been used differently by the two traditions (English and French) as a framework for analyzing and interpreting the relations and interactions between teacher and students’ mathematical activity in research studies of the authors. This article exemplifies these different ways of using AT and discusses issues the perspectives raise for interpretation and analysis.

**Abboud, Maha ; Clark-Wilson, Alison ; Jones, Keith ; Rogalski, Janine. *Analyzing teachers’ classroom experiences of teaching with dynamic geometry environments: Comparing and Contrasting two approaches***

**Abstract.** The use of digital technologies in mathematics classroom continues to increase. Yet even when well-planned, such use is not unproblematic; indeed, uncertainties are inherent. In this article, we use analyses of teachers’ activity in two classrooms, a French one and an English one, when technology in general, and dynamic geometry software in particular, is used. We present two different

theoretical frames and show how, in spite of differences related to the context, the object, and the methodological backgrounds, the outcomes in terms of the analysis of teachers' practices turn out to be close. These outcomes provide insights into the complexities of technology integration within mathematics lessons and teachers' decision making both in the moment, and over time.

**Coles, Alf ; Horoks, Julie ; Chesnais, Aurélie. *Theory and the Role of the Mathematics Teacher Educator: comparing the use of video in teacher education sessions in France and England***

**Abstract.** In this article, we compare and contrast practice-based approaches to using video in the context of mathematics primary and secondary teacher education. We look across country boundaries, with a focus on theory, in relation to the role of the mathematics teacher educator. We place the article in the context of developing interest in the facilitation of professional learning of mathematics teachers using video. In contrasting our different practices, we ask: what guides the planning of video sessions? what guides the action of facilitators during sessions? and, what are the intentions, in terms of teacher learning? We uncover similarities and differences in our practices which we theorise in terms of our espoused, enacted and intended theories, as mathematics teacher educators.

**Mangiante-Orsola, Christine ; Perrin-Glorian, Marie-Christine ; Strømskag, Heidi. *Theory of didactical situations as a tool to understand and develop mathematics teaching practices***

**Abstract.** This article aims to discuss how the theory of didactical situations in mathematics (TDS<sup>1</sup>) can be used to answer research questions concerning regular teaching practices, production of resources for regular teaching, and teacher development. In the first part we focus on TDS and the way it may be a tool for the researcher to understand teaching practices and the way it may contribute to develop teaching practices, helping teachers identify questions useful for their practice. In the second part, we present analyses using TDS in two contexts in which researchers worked with teachers, making explicit or not the concepts they used. The third part approaches, from these two contexts, the way TDS may help the collaboration between researchers and teachers (or teacher educators), in research on teacher development, in particular in the case of producing resources helping teachers to prepare their class. The comparison of the two contexts informs on the specific contribution of TDS in understanding and developing mathematics teaching practices.

**Jaworski, Barbara ; Robert, Aline. *French and English theoretical perspectives in Mathematics Education Research: an overview and discussion of key issues***

**Abstract.** In this article we focus on issues related to theories in mathematics education as used in both French and English settings. As the final article in this special issue, we review the earlier articles and focus on the key ideas and issues which stand out for us. As with the other articles, we seek to address both common and contrasting perspectives, drawing on the examples which illustrate uses of theory. We end by pointing to issues of validation, scale and policy which challenge both groups and look towards facing such challenges jointly.

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<sup>1</sup> In the more recent texts, Brousseau specifies “in mathematics”, speaking of the theory of didactical situations. Nevertheless, for short, we use TDS, which is more usual.