

LEARNING MATHEMATICS AND COMPETENCES: BRINGING TOGETHER THREE THEORETICAL PERSPECTIVES

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The symposium aims to bring into analysis and discussion a possibility of articulating and integrating theoretical concepts from Activity Theory, Situated Learning and Critical Mathematics Education in order to contribute to understanding learning in practices where mathematics and technology seem to be relevant.

This symposium emerges from the on-going work of the Project LEARN. This Project is one of the activities of the Technology, Mathematics and Society Learning Research Group of the Centre for Research in Education at the University of Lisbon. The research programme of the Group aims to bring together elements of three theoretical perspectives – Activity Theory, Situated Learning and Critical Mathematics Education – in order to illuminate forms of learning within a wide range of settings and activity having a relevant dimension of technology and/or mathematics.

The Group developed out of the informal meetings of a few researchers concerned with the need to find powerful theories that help us to analyze learning. From a small group of four people discussing five years ago the foundations of situated learning and making sense of the contribution of the idea of learning as participation in communities of practice, we became a larger group of 15 with different background and a variety of experiences aiming to put forward a theoretical framework (drawing on the three domains of theoretical developments referred above) and formulate guidelines and scenarios for learning mathematics and technology.

As oldtimers acting as coordinators of smaller groups and the newcomers being induced into the field of research in education, the Group started growing through a rather difficult challenge of interrogating the theories and provoking the emergence of bridged, links and contradictions that help us to make each next step towards a solid framework – our main goal.

Why choosing those three theoretical approaches? The historicity of each one in the last few years thrown us into a situation that seemed to be inescapable. Activity Theory (specially 3rd generation as coined by Engeström, 2001) had a go for some of us as it seems to be a rather strong framework to address the

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ways how people acting in the world transform objects into outcomes and, in doing so, learn by transforming themselves. The ways how mediating artefacts are included in the activity and contribute to shaping and sustaining the evolving actions of participants is one of the issues to be addressed in the project.

For some of us, the very notion of ‘learning as participation in communities of practice’ (Lave & Wenger, 1991; Wenger, 1998) is for a number of years at the heart of what learning is about. Recognizing the situated character of learning as an integral part of practice, allows us to look into forms of participation in practices that illuminate the key role of the shared repertoires in communities of practice and the importance of considering identity in the framework.

Because we assume that both mathematics, mathematics education and technology are not neutral and aseptic domains of practice, and because we see education as a political act, we bring into the discussion a social, political and ethical dimension of learning mathematics and we challenge the technological determinism inherent to what Bauchspies, Croissant, and Restivo (2006) call ‘technological fix’ – the idea that the accumulation of technology will solve social problems. Recognizing the complexity of the actual society, we interrogate the conditions and the phenomena of the social world that constitute western mathematics as it is taught in schools as places shaped to maintain the neo-liberal social system we live in. Critical theory in mathematics education plays a rather important role in our research as a background against which we critically address issues in learning mathematics in various practices and the implications of considering the social world read and written with mathematics (Gutstein, 2006; Skovsmose, 2006).

In the symposium, members of the Group will report on the ongoing work of the projects we are developing and will illustrate some of the ways in which we have been working to bring the various theoretical perspectives to bear together on the research field and the ways how we accommodate our daily practices to research. We will invite participants to join our conversations.

After an introduction to the Group aims we will give an overview of the issues we find more relevant for our purposes in the three theoretical perspectives – Activity Theory, Situated Learning and Critical Mathematics Education. Using our research questions as entry points, we will illustrate one of the ways through which we try to bring together and put in dialogue the various perspectives. This illustration will take the form of a ‘conversation’ about pupils and adults’ learning — and about our own learning as researchers. Participants will be invited to join us in discussing key issues focusing on the themes of learning, activity and critical participation.

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