ICT as opportunities for teaching-learning in a mathematics classroom: the semiotic potential of artefacts

Abstract:
The world in which we live has seen the fast development and spread of all kinds of new tools, in particular digital tools such as personal computers or graphing calculators, but also iPad or iPhone. The use of artefacts and technology development are certainly not a phenomenon exclusive to our times, perhaps only the incredible speed of change, and in same cases the ease of access, can be considered peculiar to our time. As a matter of fact, the construction and use of artefacts, for the most varied activities, seems to be one of the salient features of the human species.
Since the very beginning of their appearing new technologies, especially digital technologies, have raised expectations in respect to their educational potential and consequently has raised the issue of their integration in school practice. In the last twenty /twenty five years, a great amount of research energy has been devoted to this field of research that still remains very active and see a flourishing of research studies and education projects.
Starting form reflecting on how to enhance mathematical education through the use of new technologies in the classroom, my talk aims to offer the opportunity to reconsider, perhaps with new eyes, but certainly from a new point of view also the use of ancient tools, sometimes forgotten and neglected. My contribution intends to discuss the use of new technologies in mathematics education and intends to do that from a perspective large enough to take into consideration the idea of artefact without circumscribing it to the case of new technologies.
I will present a specific theoretical framework, the Theory of Semiotic Mediation, focussing on the key notion of semiotic potential that will be illustrated by examples drawn from different teaching experiments and involving ancient and modern artefacts.