Abstract. Within the frame of the Theory of Semiotic Mediation I will describe and explain the role of specific computer based contexts in fostering the development of students’ sense of proof. Elaborating on the Vygotskian notion of semiotic mediation I intend to explain how the didactic use of computational tools can support students’ introduction to mathematical proof. The key element on which the process of semiotic mediation is based concerns on the one hand, the link between tools and meanings emerging from their use in classroom activities and on the other hand the mathematical notions, which are the objective of instruction. Thus the discussion on the use of computational tools in the perspective of semiotic mediation, requires a complex analysis that can be summarized in the following components:

1. Epistemological analysis. The mathematical notions we intend to deal with; specifically, some key aspects in developing students’ sense of proof will be discussed, such as the idea of Theorem as the system of a statement, a proof and a theory within which such a proof make sense; the idea of conditional statement as the logical relation between premises and conclusion.

2. Cognitive analysis. The use of an artefact according a specific purpose generates schemes of utilization, contributing to the emergence of meanings, but also that use creates in the classroom a meaningful environment within which interpersonal discourse may evolve.

3. Didactical analysis. The design of the introduction and integration of an artefact in the classroom activities; strictly related to the cognitive analysis the didactic analysis is aimed to set up the teaching sequence.

Examples will be presented, drawn from different teaching experiments, aiming at illustrating different aspects of the semiotic mediation process, as it may unfold in the solution of specific tasks and support the educational goal.

Key words
Semiotic Mediation, Semiotic Potential, Theorem, Proof, Theoretical thinking, Conjecture, Euclidean Geometry, Geometrical Construction, DGE.

References


1 The term artefact referring to any generic product of human culture, purposefully designed to act or interact in a human setting. I follow the distinction, introduced by Rabardel (1995), although I will not exploit all its potentialities.