



A constructive and metacognitive teaching path at university level on the Principle of Mathematical Induction: focus on the students' behaviours, productions and awareness

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Abstract. We present the main results about a teaching/learning path for engineering university students devoted to the Principle of Mathematical Induction (PMI). The path, of constructive and metacognitive type, is aimed at fostering an aware and meaningful learning of PMI and it is based on providing students with a range of explorations and conjecturing activities, after which the formulation of the statement of the PMI is devolved to the students themselves, organized in working groups. A specific focus is put on the quantification in the statement of PMI to bring students to a deep understanding and a mature view of PMI as a convincing method of proof. The results show the effectiveness of the metacognitive reflections on each phase of the path for what concerns a) students' handling of structural complexity of the PMI, b) students' conceptualization of quantification as a key element for the reification of the proving process by PMI; c) students' perception of the PMI as a convincing method of proof.

Key words and phrases: mathematical induction; quantification; constructive teaching/learning; metacognition; proofs/refutation of conjectures; university level.

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