

Teaching ways of thinking instead of overcoming ideas: The case of idealization

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ABSTRACT. Researchers in science education have focused for more than 25 years now on overcoming students' ideas concerning science concepts and phenomena. However, in a number of cases students' ideas seem quite persistent and carry an alternative coherence. In those cases, if we make a step back and try to see the whole picture we might recognize an active or missing thinking pattern or a way of thinking. In this paper a research concerning the teaching of motion and especially the introduction to inertia is presented. In the first phase of the research there was an attempt to overcome student's ideas with some but not encouraging enough results. In the second phase the research was focused on teaching idealization and the results have been far better than in the first phase. In both phases the same instructional material was used (that is a set of experiments based on Galileo's work about the study of motion and especially the study of pendulum), however from the first to the second phase there has been a shift in the focus of research from the cognitive (ideas about motion) to the metacognitive level (idealization) of teaching and learning science.

