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Instrumented learning of properties in geometry: propaedeutics for the acquisition of proving competencies. (L'apprentissage instrumenté de propriétés en géométrie: propédeutique à l'acquisition d'une compétence de démonstration.)

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Summary: Our paper aims at showing how the instrumented learning of the properties in Euclidean geometry can be introduced in continuity with the mathematical competences developed at the elementary school. The principle founder of our research is based on the relation of subordination between the constraints of a property, posed using dynamic geometry software, and a necessary conclusion. Starting from an experimentation carried out in classes of 12–14 years old in France and in Quebec, our study presents a critical analysis of results where the ultimate objective of the activities suggested to the students relates as well to the significance of elementary properties, as on the understanding of the necessity of the link between the antecedents to the consequents of a deduction. Before ending by the didactic consequences of our approach, the text introduces the concept of instrumented figural inference as a means, employed by certain students, to justify a step of structured reasoning. A reconciling of the semiotic, instrumental and discursive aspects is offered throughout the paper.

Classification: G43 U73

Keywords: register of dynamic figures; operational dynamic figure; instrumented figural inference; student-milieu interactions; semiotic mediation; geometrical working spaces

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