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Spaces for geometric work: figural, instrumental, and discursive geneses of reasoning in a technological environment.

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Summary: The main goal of this research was to assess the effect of a dynamic environment on relationships between the three geneses (figural, instrumental, and discursive) of spaces for geometric work. More specifically, it was to determine whether the interactive geometry program GeoGebra could play a specific role in the geometric work of future teachers. The training reveals education students' use of intuitive and deductive reasoning as well as their degree of cognitive flexibility in using different facets of geometrical work. The study shows that a perspective on the development of geometric reasoning must be integrated in the development of skills for future teachers. In particular, a focus on the construction of a discursive genesis linked with elements of figural genesis must be added to the traditional focus on instrumental genesis. This reasoning requires in particular a reflection on the role of properties in developing a form of geometry directed by practical (Geometry I) or more axiomatic (Geometry II) goals.

Classification: G49 G89 U79

Keywords: geometry; initial teacher training; professional knowledge; space for geometric work; technological environment

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