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Gómez-Chacón, Inés M.; Romero Albaladejo, Isabel M.; García López, M. del Mar

Zig-zagging in geometrical reasoning in technological collaborative environments: a mathematical working space-framed study concerning cognition and affect.

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Summary: This study highlights the importance of cognition-affect interaction pathways in the construction of mathematical knowledge. Scientific output demands further research on the conceptual structure underlying such interaction aimed at coping with the high complexity of its interpretation. The paper discusses the effectiveness of using a dynamic model such as that outlined in the Mathematical Working Spaces (MWS) framework, in order to describe the interplay between cognition and affect in the transitions from instrumental to discursive geneses in geometrical reasoning. The results based on empirical data from a teaching experiment at a middle school show that the use of dynamic geometry software favours students' attitudinal and volitional dimensions and helps them to maintain productive affective pathways, affording greater intellectual independence in mathematical work and interaction with the context that impact learning opportunities in geometric proofs. The reflective and heuristic dimensions of teacher mediation in students' learning is crucial in the transition from instrumental to discursive genesis and working stability in the Instrumental-Discursive plane of MWS.

Classification: G40 U70 E50 C70
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