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Students' use of computational thinking in linear algebra.

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Summary: In this work, we examine students' ways of thinking when presented with a novel linear algebra problem. Our intent was to explore how students employ and coordinate three modes of thinking, which we call computational, abstract, and geometric, following similar frameworks proposed by *J. Hillel* [in: On the teaching of linear algebra. Dordrecht: Kluwer Academic Publishers. 191–207 (2000; ME 2016a.00720)] and *A. Sierpinska* [in: On the teaching of linear algebra. Dordrecht: Kluwer Academic Publishers. 209–246 (2000; ME 2016a.00721)]. However, the undergraduate honors linear algebra students in our study used the computational mode of thinking in a surprising variety of productive and reflective ways. This paper examines the solution strategies that the students employed to solve the problem, emphasizing their use of the computational mode of thinking.

Classification: H65 C35 D55
Keywords: justification; linear algebra; problem solving; procedural understanding; conceptual understanding
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