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Martinez, Mara V.; Castro Superfine, Alison

Integrating algebra and proof in high school: students' work with multiple variables and a single parameter in a proof context.

D33 E53

Summary: In the United States, researchers argue that proof is largely concentrated in the domain of high school geometry, thus providing students a distorted image of what proof entails, which is at odds with the central role that proof plays in mathematics. Despite the centrality of proof, there is a lack of studies addressing how to integrate proof into other mathematical domains. In this article, we discuss a teaching experiment designed to integrate algebra and proof in the high school curriculum. Algebraic proof was envisioned as the vehicle that would provide high school students the opportunity to learn not only about proof in a context other than geometry but also about aspects of algebra. Results from the experiment indicate that students meaningfully learned about aspects of both algebra and proof in that they produced algebraic proofs involving multiple variables and a single parameter, based on conjectures they themselves generated.

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Keywords: high school students; elementary algebra; secondary school curriculum; secondary school mathematics; validity; mathematical logic; teaching methods; grade 9; grade 10

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