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Smith, Toni M.; Hjalmarson, Margret A.

Eliciting and developing teachers' conceptions of random processes in a probability and statistics course.

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Summary: The purpose of this study is to examine prospective mathematics specialists' engagement in an instructional sequence designed to elicit and develop their understandings of random processes. The study was conducted with two different sections of a probability and statistics course for K-8 teachers. Thirty-two teachers participated. Video analyses within a collaborative course design were used to support a teaching experiment about teachers' conceptions of random processes. In particular, teachers were asked whether the outcomes of rock-paper-scissors (RPS) are generated randomly or not, were presented with a definition for random selection, and were asked to come to a conclusion about RPS. Teachers struggled to reconcile the equality of winning outcomes for each player with the potential for human interference in the process of generating outcomes. Ultimately, teachers concluded the outcomes were not generated randomly, but encountered a variety of unexpected obstacles along the way.

Classification: K59 K69 K49 B50 C39

Keywords: video technology; probability; statistics; elementary education; mathematics teachers; middle school teachers; elementary school mathematics; elementary school teachers

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