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Middle school mathematics teachers' responses to a student's mistaken mathematical conjecture and justification.

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Summary: The purpose of the study is to investigate the reality of middle school mathematics teachers' subject matter knowledge for teaching mathematical conjecture and justification. Data were collected in interviews with nine Chinese and ten Korean middle school mathematics teachers. The teachers responded to the question that was designed in the form of a scenario that presents a teaching task related to a geometrical topic. The teachers' oral responses were audiotaped and transcribed, and their written notes were collected. The results of the study were compared to the analysis of American and Chinese elementary and secondary teachers' responses to the same task in [*D. L. Ball*, Knowledge and reasoning in mathematical pedagogy: examining what prospective teachers bring to teacher education. East Lansing: Michigan State University (Diss.) (1988); *L. Ma*, Knowing and teaching elementary mathematics: teachers' understanding of fundamental mathematics in China and the United States. Mahwah, NJ: Lawrence Erlbaum Associates (1999; Zbl 0938.00008)]. The findings of the study suggested that teachers' approaches to explaining and demonstrating a mathematical topic were significantly influenced by their knowledge of learners and knowledge of the curriculum they teach. One of the practical implications of the study is that teachers should recognize the advantages of learning the conceptual structure of a mathematical topic. It allows the teachers to have the flexibility to come up with meaningful mathematical approaches to teaching the topic, which are comprehensible to the learners rather than rule-based algorithms.

Classification: B50 D69 C49 C70 E50

Keywords: mathematical conjecture; justification; mathematics teachers knowledge

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