IS IT A MATHEMATICAL PROOF OR NOT ?
ELEMENTARY SCHOOL TEACHERS' RESPONSES

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There is a wide consensus in the mathematics education community that teachers should encourage students to make mathematical conjectures. In addition, students should be encouraged to investigate and validate various conjectures (e.g., NCTM, 2000). In this instructional approach, the teacher should relate to the conjectures that arise in his/her class and to the ways that the students use to verify them. It is therefore essential for teachers to be intimately familiar with both formulating conjectures and reacting to arguments that purport to prove or refute mathematical conjectures.

The main aims of this study are to examine elementary school teachers' subject matter knowledge and pedagogical content knowledge concerning proofs and refutations. This paper focuses on elementary school teachers' reactions to common, correct and incorrect, justifications to universal theorems.

Twenty-seven elementary school teachers were asked if they would accept several, given justifications to various universal theorems and to explain their decisions. The given justifications included numerical examples, algebraic proofs and non-formal generalizations. The specific justifications that were used in this study were provided by the same elementary school teachers when they were asked to determine the validly of these statements and to prove their positions. These results were described in a previous PME paper (Barkai, Tsamir, Tirosh & Dreyfus, 2002). Interestingly enough, a substantial number of teachers rejected the justifications that were identical to those that they themselves wrote when they were asked to prove these statements. In the presentation we shall describe this and other results of the study.

References

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