

# The Misuse of Mathematical Proof Methods: New Approaches and Suggestions

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**Abstract:** In this research, some general misuses of mathematical proof methods and interchangeably used concepts in Turkish sources, which do not correspond conceptually, were analyzed. It was found that there is not a common language in mathematical proof methods and there are inconsistencies or missing topic descriptions in Turkish literature (math textbooks, lecture books, articles etc.). The importance and necessity of mathematical proof methods was expressed and some nice general suggestions were given in some Turkish articles. However, in these articles, it has not been seen that remarkable, specific and new recommendations or methods were suggested for a better understanding of the mathematical proof methods and awareness of the misuse of proof methods for Turkish students.

A survey attempting to determine how well the proof methods are known and to what extent students are aware of the misuse of proof methods was conducted. Survey questions including Proof Opinion Questionnaire, Mathematical Proof Knowledge Test were given to students in primary mathematics education and mathematics departments. Interviews were arranged with volunteer students. Questions such as; giving reasons why students picked that answer, which proof methods were used, why that method was chosen, how it can be solved with another method, whether there are similar methods to the used methods were examined. Some questions preferred to evaluate whether they know the concepts of mathematical proof methods properly or not. It is concluded that teacher candidates and academician candidates do not know mathematical proof methods properly, they either confuse the methods or misuse them. Especially, this can be seen in 2015- 2016 academic year eleventh grade advanced math textbooks, where there were mistakes and inconsistencies in mathematical proof methods. It was a gratifying development that some of these books were generally revised after 2016. In order to minimize the mistakes and inconsistencies and to understand better the mathematical proof methods, different approaches having not been made so far will be suggested to the mathematics teachers, university academicians and ministry of education.

**Keywords:** Mathematics education, proof methods, mathematical reasoning

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