

Improving the Quality of Proofs for Pedagogical Purposes: A Quantitative Study

Contributed Research Report

In university mathematics courses a primary means of conveying mathematical information is by mathematical proof. A common suggestion to realize learning goals related to proof is to increase the quality of the proofs that we present to students. The goal of this paper is to investigate evidence related to the question: What changes to a proof do mathematicians believe will improve the quality of a proof for pedagogical purposes?

We present quantitative findings that corroborate hypotheses generated by a qualitative study of features of proofs that mathematicians find pedagogically valuable. Our work examines hypotheses related to typesetting, brevity, and the framework of a proof. One of our findings suggests that there is not a consensus among mathematicians what level of justification is desirable or necessary for the purposes of teaching undergraduates, though there may be common themes in the warrants they give for the level chosen.

Key words: proof evaluation, mathematicians, proof revision, quantitative study.