

Title: Toulmin Analysis: A Tool for Analyzing Teaching and Predicting Student Performance in Proof-Based Classes

Abstract: This paper provides a method for analyzing undergraduate teaching of proof-based courses based on Toulmin's model of argumentation. The paper then describes how that analysis can be used as a predictor of subsequent student proof-writing performance and shows that the predictions are reasonable approximations of students' subsequent proof-writing. The method of analysis was developed via research in a lecture-based abstract algebra class, it has application, to any lecture-based, proof-intensive course. This method provides one possible way to directly link classroom teaching activities to subsequent student performance that would force instructors to assume more responsibility for their students' demonstrated end-of-course performance.

Keywords: proof, Toulmin analysis, abstract algebra, classroom research