

AN EXAMINATION OF HOW TEACHERS USE CURRICULUM MATERIALS FOR THE TEACHING OF PROOF IN HIGH SCHOOL GEOMETRY

Ruthmae Sears

Dr. Óscar Chávez, Dissertation Supervisor

ABSTRACT

This case study examined how three high school geometry teachers used their geometry textbooks (*Prentice Hall Geometry* and *McDougal Littell Geometry*) to teach proof. More specifically, it focused on the nature of the differences between how proof is presented in the written curriculum and how it is reflected in the enacted curriculum in a high school geometry course. Data were collected via a classroom observation protocol, teacher artifacts, audio and video classroom recording, and teacher interviews. The conceptual analytical framework used was comprised of the Mathematical Tasks Framework (Henningesen & Stein, 1997) and a proof schemes framework (Harel & Sowder, 1998).

The data analysis revealed that the geometry curriculum materials used by the teachers in this study provided few opportunities to prove, and that there were differences between textbook series in the tasks' features and the levels of cognitive demand of proof tasks. Additionally, the teachers in this study enacted proof tasks generally by promoting *memorization* or *procedures without connections*. Moreover, whenever lower-levels cognitive demand tasks were posed *external conviction proof schemes* were more evident; while *analytical proof schemes* appeared more frequently when higher-level cognitive demand tasks were posed. Furthermore, teachers' beliefs, experience, desire to make mathematics "easy", community, and assessment were factors that contributed to how proof was taught.