Researchers are trying to understand which undergraduate learning experiences will help pre-service secondary mathematics teachers (PSMTs) develop practices that align with reform-oriented movements. The purpose of this research is to contribute to the understanding of educational experiences that will afford PSMTs the learning of practices for teaching secondary mathematics. A cohort of PSMTs (n = 11) was purposively selected for this study. These PSMTs were enrolled in a Teaching Algebra Seminar that allowed them to teach a section of a College Algebra course and reflect upon their practices with peers and a mathematics professor. Questionnaires, interviews, and field notes were used as data sources to understand what PSMTs learned in this course related to mathematically-oriented practices of teaching. The aspects of the Teaching Algebra Seminar that promoted these changes may inform the design of mathematics teacher education programs and related mathematics courses. (Received September 20, 2007)