

Meeting: 1003, Atlanta, Georgia, MAA CP V1, MAA Session on Research on the Teaching and Learning of Undergraduate Mathematics

1003-V1-352 **Stephen D Blair*** (blairst@gvsu.edu), Mathematics Department, Grand Valley State University, 1 Campus Drive, Allendale, MI 49401. *Describing Undergraduates' Reasoning Within and Across Multiple Geometries.*

Prospective teachers need experiences that deepen their understanding of the core geometric ideas that they will be expected to teach. One recommended strategy is to provide them with experiences involving non-Euclidean geometries that will challenge their basic assumptions. Frameworks used to describe students' geometric thinking, however, have focused upon reasoning within Euclidean geometry. The author designed and co-taught an undergraduate course in which students explored concepts within and across Euclidean, spherical, and taxicab geometries. A qualitative research approach was taken wherein six case studies of students were constructed to describe the extent by which relations between properties of geometric objects and systems of such relations were the students' primary "objects of thought". Analyses were grounded in current versions of the van Hiele model of geometric thinking and the Pirie/Kieran model for growth in mathematical understanding, and resulted in an expanded framework based upon interpretations of these models. This talk will present this framework and share some examples of how it was used to describe undergraduates' reasoning during the study. (Received September 12, 2004)