

1067-I1-2215

Philip K Hotchkiss* (photchkiss@wsc.ma.edu), Department of Mathematics, Westfield State University, Westfield, MA 01086, and **Julian F Fleron, Volker Ecke** and **Christine von Renessee**. *Student Inquiry into the Limits of Knowledge - Removing Barriers in Mathematics for Liberal Arts*. Preliminary report.

Liberal arts students often face a huge barrier in mathematics because they think it does not touch their world in significant ways. In this talk we share inquiry-based materials and approaches we have developed to help move beyond these barriers by focusing on the themes “What do we know?” and “Are there limits to knowledge?”

Spurred by Catherine’s admonishment “It doesn’t prove anything!” to Hal in David Auburn’s *Proof*, students consider questions of existence, and the limits of knowledge, by interacting with: debates about perception (including Plato’s Allegory of the Cave and Descartes cogito); types of reasoning and burdens of proof; mathematical logic and proof, including non-existence proofs; relativity, uncertainty, and incompleteness – their scientific and cultural roles; chaos and sensitive dependence on initial conditions (via Ray Bradbury’s “Sound of Thunder” whose 1952 butterfly predates the “founding work” by Lorenz); etc.

We will discuss how one can integrate these deep mathematical topics into inquiry based approaches, why these topics are important for mathematics for liberal arts students, and how we hope students will benefit from these experiences. (Received September 22, 2010)