1145-J1-2568 **Lee W. Singleton*** (lsingleton@whatcom.edu). *Tactile Trigonometry: Lessons Learned from a Tactile Active Learning Classroom.*

Students in elementary school often learn through tactile manipulatives and active learning, but students rarely "get their hands dirty" in college math classes. Several issues can present barriers to employing tactile learning techniques including content related manipulatives, pre-designed lessons using manipulatives, physical space or time constraints, and many other factors. Through an NSF grant (DRL-1623405) "EAGER: MAKER: Engaging Math Students with 3d Printing for STEM Success," Dr. Lee Singleton has developed several manipulatives and active learning lessons at the Precalculus II (trigonometry) level to help students employ their sense of touch while learning. Data gathered over the two-year grant shows student performance on exams in Singleton's tactile classes are generally higher than his lecture classes. This paper will not only report on the data, but will also offer some insight into resources, techniques, and challenges that arose while working to get students physically involved in their learning. Preliminary work on an active grant (DUE-1834425) "Collaborative Research: Improving Representational Competence by Engaging with Physical Modeling in Foundational STEM Courses" involving the creation of manipulatives and lessons for Calculus II will also be shared. (Received September 25, 2018)