

Meeting: 1003, Atlanta, Georgia, MAA CP G1, MAA Session on Drawing on Our Students' Thinking to Improve the Mathematical Education of Teachers

1003-G1-392 **Rapti M. de Silva*** (rdesilva@csuchico.edu), Department of Mathematics & Statistics, CSU Chico, Zip 525, Chico, CA 95929-0525. *Creating and "Proving" Alternate Definitions*. Preliminary report.

For many students a definition is a statement about a mathematical object that has to be memorized. The nature of a definition as a set of necessary and sufficient conditions to "create" the object being defined eludes most students, partly because they are rarely asked to verify different definitions for the same object, let alone create their own. In my geometry course for prospective elementary teachers, students use Geometer's Sketchpad to verify that a given definition is both necessary and sufficient and to create and test their own definitions of familiar geometric concepts. Students grapple with the notion of minimal conditions implicit in a definition, especially when creating their own. In testing a definition or creating their own, they begin to actualize the process of deduction. In particular, the process draws on student thinking about the concept being defined and encourages them to gain a better understanding of related mathematical concepts and the nature of these relationships as they seek to create new definitions. In addition to sharing some of the different definitions they created and their strategies for verifying them, I will share the discussions that ensued when students presented their different approaches for verifying the same given definition. (Received September 13, 2004)