

1125-VQ-1061 **Shumei C Richman*** (richmansmc@gmail.com). *Formula vs. Concept: A Dual Process for Solving Problems in Beginning Algebra*. Preliminary report.

In my ten plus years teaching remedial algebra courses in colleges, I have searched for root causes of many common mistakes made by my students, and accordingly designed alternative ways of teaching to help them avoid these mistakes. Of the several ways I have designed, one is, when introducing a new formula for solving problems, to add the corresponding concept approach alongside the commonly used formula approach, and discuss the differences. This dual process has been well accepted by most of my students, because of its three main advantages. First, the concept approach, revealing many more math concepts in details, serves as a bridge allowing students not only to learn how to use the formula, but also to understand what it means, and why it works. This deeper level of understanding helps students avoid many mistakes. Secondly, the math concepts revealed help students connect the new formula to what they have learned earlier and so, for the long term, help them build up their mathematical sense. Furthermore, a concept approach often requires students to interpret math symbols and analyze the problem, instead of following steps and plugging in numbers as required by a formula approach, and so helps them build up their abilities to independently tackle problems. (Received September 14, 2016)