

MathChavrusa: A Partnership Learning Model

Rochy Flint
Columbia University

In this poster we introduce a new learning modality called MathChavrusa. Inspired by the ancient rabbinic approach to Talmudic study, the chavrusa model pairs students in a partnership of deep text-based analysis, discussion, and debate. Over centuries the model has proved its ability to generate thorough understanding, build skills, develop the courage to question, and demonstrate to students the value of both independent thinking and collaboration.

MathChavrusa is a complementary model to other accepted modalities for generating student understanding in mathematics. It is particularly effective when employed after a lecture class. In teaching about the model, we will discuss its origins, how it facilitates deep learning and understanding in mathematics, and techniques for implementation. We have begun to utilize the model in our classes, and are gathering data about its real-world effectiveness. Preliminary data implications will be discussed.

Keywords: Mathematics Identification, Text-based learning, Collaboration, Peer study partnership

Cultivating mathematics identification is critical to engage undergraduate students in mathematics. Peer support and collaboration are critical components for increasing mathematics identification (Walker, 2006). A demonstrably effective educational philosophy exists which moves away from the teacher-centered classroom to student-centered learning environments where learning can happen in a profound way (Freeman et al, 2014). Effective tools for mathematics skill building and mathematics identification are paramount for student success in mathematics. Peer collaboration has been shown to improve students' ability in tasks that require reasoning (Phelps & Damon, 1989). There is evidence that student-centered small group learning alleviates attrition and is beneficial in undergraduate STEM student presence in all demographics (Springer et al, 1999). Students are often too teacher dependent and fear the math textbook. The learning model MathChavrusa is designed to foster independent mathematics learning, peer collaboration, critical thinking, and text-based learning. We introduce and study the practical benefits of implementing this learning model in undergraduate mathematics learning environments.

In summary, MathChavrusa implementation requires students to be paired (they can self-pair or the instructor can do the pairing) and maintain the same partner throughout the duration of the course. Depending on course structure, it is recommended a minimum of twenty minutes per class session to engage in MathChavrusa. Students engage in inside math textbook reading and discussion with their study partner (chavrusa). A study guide and posed questions highlighting the mathematics material can help deepen and increase the benefits of MathChavrusa.

Currently MathChavrusa has been implemented in 6 institutions in the following courses: remedial college algebra, calculus, linear algebra, differential equations, and topology. Currently our data gathering and analysis is focused on qualitative data, evaluating initial benefits such as deeper mathematics understanding, improved mathematics communication, confidence in mathematics assignments and increased aptitude in mathematics text-book learning. We are in the process of analyzing data as to its effectiveness.

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