

## **Affecting Students' Ways of Knowing Mathematics**

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Crossroads in Mathematics (AMATYC, 1995) and Beyond Crossroads (AMATYC, 2006) provide a vision for teaching and learning of mathematics in which students actively participate in exploring, problem-solving, and reasoning, and see mathematics as a useful tool in solving real-world problems. These standards also suggest pedagogies such as collaborative learning, use of technology, and teaching for conceptual understanding. However, many instructors have found that their students are not accustomed to engaging in learning and doing mathematics in this way and are at a loss as to how to help them develop. Students' ways of engaging with mathematics are affected by their ways of knowing; their beliefs about whether mathematical knowledge is certain and how they acquire knowledge influences learning. In this article we use examples from two precalculus classes to look at how students' ways of knowing may be affected by classroom environment.