

## The role of affect and productive struggle in the problem-solving process

Dr. Nadia Monroe Mills, Faculty, College of Science and Mathematics

The ability to succeed in Science, Technology, Engineering, and Mathematics (STEM) careers is contingent on a student's ability to engage in mathematical problem solving. Much research has been conducted on mathematical problem solving, beginning with Polya's (1945) seminal work and moving towards factors that influence students' success in problem solving. However, there is a need to accumulate this research through the creation of a problem solving theory. Schoenfeld (2011) developed such a problem-solving theory which attributes an individual's goals (personal aims to achieve), resources (knowledge available), and orientations (beliefs, values) as influential factors in the decisions made during any goal-oriented activity. In this study, two students', incoming and returning freshmen at an HBCU participating in a summer bridge program, problem-solving process was analyzed. Data collection included the use of individual task-based interviews followed by video-stimulated response interviews. It was found that a student's belief about problem solving determined how they dealt with negative emotions during their sessions. The data indicate that affect is the driving force that moves the student through the problem-solving phases.

Keywords, productive struggle, affect, mathematical problem solving, theory