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Increasing Understanding While Overcoming Misconceptions through Discovery Conversations

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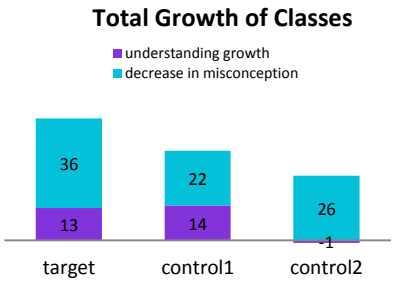
Introduction: Currently there are more jobs than ever in the STEM (Science, Technology, Engineering, and Math) fields, opening new job opportunities for students. In order to help prepare my students for these careers, I used Discovery Conversations to increase my third grade students' content understanding, decrease their misconceptions about science, and instill the skills necessary to prepare them for the jobs of the future. The inspiration for this investigation came from three-8 week summer work experiences at a Salt River Project, where I observed the skills and strategies in STEM careers. Business professionals are required to discuss their findings, projects, and brainstorm solutions throughout their day. These skills of communication and collaboration are key in today's workplace. Over the past school year, I taught these skills while examining misconceptions in science through coaching of student-led discussions. The coaching sessions were referred to as Discovery Conversations.

To understand the importance of Discovery Conversations, I implemented two types of instruction during the three science units taught throughout the school year; Habitats, Light, and the Solar System. All classes were taught the same material, however, the target class was given time to discuss the difficult concepts within small groups and then as a learning community through Discovery Conversations. The collaborative processing time allowed the target students to be more successful than the other classes.

Finding 1: Students were graded on a variety of activities, including paper-pencil tests, projects, and presentations. Over the course of the year, students' conceptual understanding of topics increased. The average student performance grew from a 73%, to a 76%, to a 79%. The Discovery Conversations helped the students grow academically across the school year.

Finding 2: All students decreased in the number of misconceptions during the school year. Students created concept drawings to demonstrate their understandings before and after each unit. From these drawings, I was able to determine which concepts were understood and which were not. The average student was able to overcome more than one (1.4) misconception by the final unit. This increased from and average score of 0.6 of a concept.

Finding 3: The Discovery Conversations allowed the target class to make more growth than the other classes. All of the classes made progress throughout the year, however, the target class showed the most overall growth.



Plan of Action: The evidence found in my action research suggests that Discovery Conversations are beneficial to my students. I plan to continue this intervention with all of my classes. These discussions will become a central theme to all of my science and engineering units. My findings show that students require time to practice this collaborative skill and develop the 21st Century skills necessary for the STEM careers of the future.