How Do We Learn Best?

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Introduction:

In order for learning to occur, one must change their original conception (Posner, 1982). Conceptual change is the transition from what is originally thought to what is learned. Teaching for conceptual understanding promotes a deeper depth of knowledge as opposed to traditional teaching of memorizing facts and information. Working at Arizona Public Service (APS), an electric utility company, I was able to experience the importance of conceptual understanding in science, technology, engineering and math (STEM). Seeing, first-hand, the science involved in generating electricity (from solar power to nuclear power) revealed how important it is for skillful employees to have a deep understanding of STEM content.

The purpose of this research was to increase student conceptual understanding in science. Teaching interventions such as dialogic teaching and group activities were implemented to cultivate student conceptual understanding. Data was collected from 118 eighth grade general science students and included teacher observations, audio recordings and surveys about learning. A teacher journal was kept to record student activities and discussions.

Findings:

Students indicated that they learn best by "doing". When given a choice, most students mentioned they learned best through hands-on activities or by participating in an activity. An effective way for students to gain a conceptual understanding is through dialogic (conversation) teaching. Analysis of my observations during key activities revealed that students held different conceptions but were able to help each other understand physical and chemical changes through student dialogue. A survey with student reflections indicated multiple pathways of gaining conceptual understanding. Students specified several different avenues for fostering conceptual change moments. No single path of learning was indicated by the students.

This study emphasizes how complex conceptual change and conceptual understanding truly are. Few students indicated they believe they learn through group discussion. However, my teacher journal showed learning through student discussion. Additionally, students indicated a variety of ways to gain conceptual understanding. This implies that students might not be fully aware of their metacognition (thinking about their learning).

Action plan:

Going forward, I plan on implementing more dialogic teaching and group activities within my classroom to promote conceptual understanding and prepare my students for the STEM industry.