The Effect of "Wonder" Science Videos on Student Attitudes in Science

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Introduction

The situation: Located in rural Indiana, Cloverdale High School serves a predominately white population with a high percentage (almost 50%) of students on free and reduced lunch. I am working with a sample of 68 students of which 33 are enrolled in Chem 1 and 35 in ICP.

The school offers a limited range of science courses:

Biology 1 (freshmen), Chemistry 1, Integrated Chemistry-Physics (ICP) (sophomores) and for juniors/seniors: Biology 2, Chemistry 2 and Physics. I teach the Chemistry, ICP and Physics classes.

I had questions:

- How can I introduce students to a wider range of science disciplines than we have available as courses?
- How can I create an excitement for science and kindle curiosity in the students
- How can I create a classroom where students feel free to ask questions and get answers about science topics of personal interest not in the curriculum.
- Many of my students say they "hate science." How can I turn that around?

A potential answer: Surveys indicated that most students enjoyed learning from videos.

Research Questions

Primary Question:

"What is the effect of showing a short, weekly "wonder" science video on student attitudes?"

Specifically:

(1) What is the effect on students' enjoyment of class and on their desire to take more advanced science courses?

(2) What is the effect on students' curiosity about the science topics highlighted in the videos and on their initiation of discussions on science topics of personal interest?

(3) What is the effect on student career interests?

(4) How do the videos affect the overall use of class time?

(5) How do the videos affect my interactions with the students?

Treatment

Examples of "Wonder" Science Videos

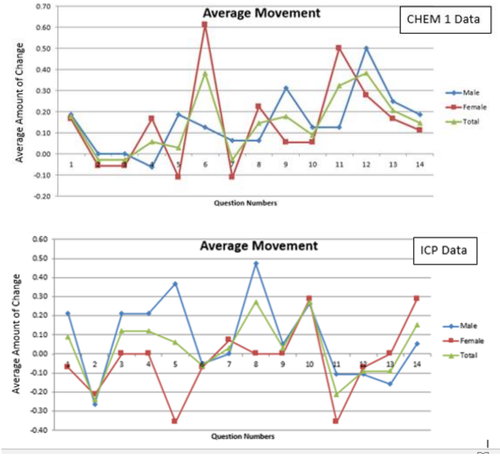
Subject	Title
Anthropology	Can Apes Really Talk to Humans?
Biology	Saving the Island Fox
Medicine	Fecal Microbiota Transplants
Physics	5 of the Biggest Puzzles of the Universe
Engineering	Human-Powered Helicopter
Geology	The Lava Affair

Student Quotes

- "I learned about something I didn't know." (Chem 1 girl)
- "I liked seeing them figure out a way to get it to work." (Chem 1 girl)
- "It's pretty cool." (several Chem 1 and ICP boys)
- "This video was cool, it showed a lot of new things I didn't know." (ICP girl)
- "It made me more interested in taking another chemistry class." (Chem 1 girl)
- "Some of the videos leave me with many questions." (Chem 1 boy)

Results and Analysis

The data showed different results according to which class and gender was studied but survey responses showed an overall increase in curiosity about science and desire to learn more about topics from the science videos.



There was a noticeable increase in both classes of student-initiated questions about science topics of personal interest and several students reported an increase in talking about science with family and friends due to the videos. Although there was little effect on overall college and career plans, there seemed to be an increase in the number of students enrolling in advanced science classes for next year.

Conclusion and Value

This research supports the idea that initiating a program of short science videos on a weekly basis is valuable to enable teachers working in schools with few resources to enrich student background knowledge, increase curiosity in science, and promote student-initiated discussions that explore and validate their own interest in science. It is free, takes little extra time, and only requires computer access and a projector, yet has an effect that can address student misconceptions about science (It's too hard to understand") by making it accessible, can introduce students to real scientists and their work in approachable and nonthreatening ways, and improve girls' confidence in their ability to do science.