

Institute for Quality Science Teaching

2017-2018 Foundations of NGSS

Research and Evaluation Executive Summary

Goal

To measure change in Foundations of NGSS-participating educators' attitudes and behaviors associated with science instruction and specifically practices aligned to the Next Generation Science Standards (NGSS).

Why

Change in educators' attitudes toward science education and classroom behaviors is a goal of the Institute for Quality Science Teaching's teacher professional development programs.

What

This course helps school teams enhance their capacity to integrate NGSS-aligned instruction across grade levels.

Who

Science teachers in grades 4 through 8 who chose to participate in the Foundations of NGSS course during the 2017-2018 academic year.

How

The survey consisted of the following sections:

- Section 1: Six questions about participants' feelings of nervousness/anxiety/confidence around teaching science¹.
- Section 2: Six questions that elicit information about participants' behaviors related to teaching science¹.
- Section 3: 21 questions that generally ask participants how often they engage in instruction aligned with NGSS-specific science and engineering practices².
- Section 4: 11 questions that ask participants how often their students engage in NGSS-aligned science and engineering practices².

When

Pre-surveys were administered prior to the start of the course and the post-survey was completed after the final session.

Results

Overall educator behaviors related to science instruction changed significantly between the start and end of the course. In particular, they show more emphasis on helping students investigate on their own. However, we did find some areas where teachers reported less emphasis: explaining reasoning, supplying evidence, using alternative explanations and

using inclusive language. We need to explore this in a follow up study, but one theory is that it is a manifestation of educators beginning the course without full comprehension of various NGSS practices. And, after they learn about them come to realize they are not using them in the classroom. Sometimes this is referred to as the “you don’t know what you don’t know until you know it” effect. We may test this by following up with the educators a year from now, to see how they have been able to integrate what they learned into the classroom.

The only change in attitudes we found was a decrease in anxiety about teaching science.

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¹Taken from The Dimensions of Attitudes of Science
(van Aalderen-Smeets & van der Molen, 2013)

²Taken from Measuring Science Instructional Practice
(Hayes et al., 2016)