



# Shifting to Science and Engineering Practices Through Instructional Coaching

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## Background

As the Next Generation Science Standards continue to be a focus in Iowa classrooms, many teachers have limited knowledge, minimal preparation and few resources to help guide them to this new way of teaching. With this in mind as the Instructional Coach for the 6-12 staff at Central City Schools, the purpose of my study observed if using individualized coaching cycles specifically within the eight Science and Engineering Practices raised teachers' efficacy, impacted students' efficacy in this area as well.

## Treatment

Three Science teachers went through an individualized 4-week coaching cycle. The purpose of the coaching cycle was to look at all eight S&E practices and plan, discuss, and reflect on their implementation and student understanding. The goal was to incorporate terminology and ideas of the S&E practices within their classroom.

## Scientific and Engineering Practices

1. Asking questions (for science) and defining problems (for engineering)
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations (for science) and designing solutions (for engineering)
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

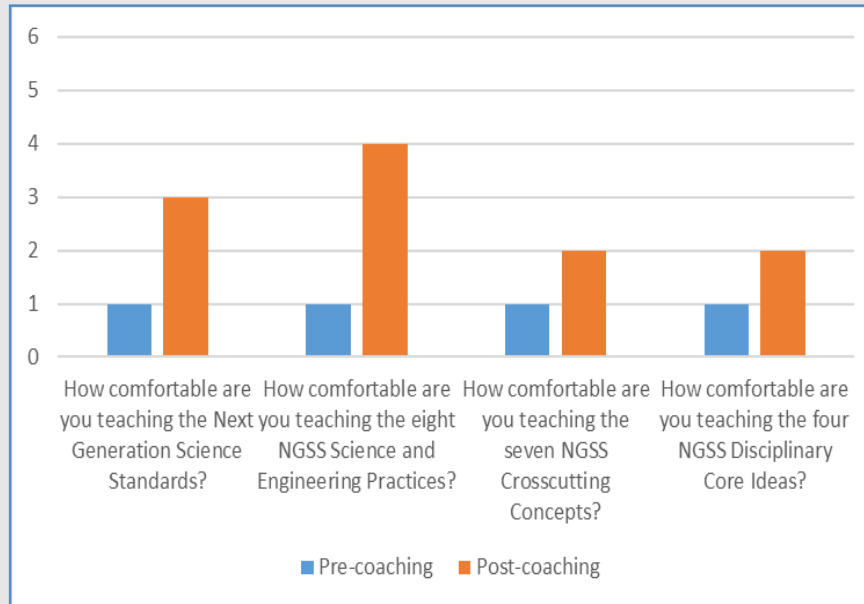


## Research Questions

Primary Question: How does individualized instructional coaching impact teacher knowledge and implementation of the eight Science and Engineering practices?

Secondary Question: : Does this individualized instructional coaching have an effect on the longevity of use and implementation of S&E practices in the classroom?

Secondary Question: How does this teacher efficacy in S&E practices affect students' growth in Science?



1 – very uncomfortable; 6 – very comfortable

## Conclusion and Value

All three teachers showed positive gains in their familiarity, comfort, and implementation of the S&E practices.

Although the students' surveys indicated a positive increase in knowledge of the S&E practices, the gains were minimal. The post interviews given to students showed little increase in understanding of S&E practices.

Coaching can have a powerful impact on teachers' knowledge, pedagogy, and confidence. Building trust and having a good relationship with the teacher is a key component for success.