**Summary:**

Explicit instruction of scientific process skills, meeting students' and curriculum needs

Teaching transferrable skills via an inquiry-based approach has been increasingly emphasized in science classrooms (1). Such inquiry skills are essential for succeeding in rigorous college classes and making critical decisions in their daily lives (2,3).

“Scientific Process in Practice” was a 2 hour long, weekly seminar designed to complement a field course for incoming oceanography majors (sophomores and juniors). Students conduct mini research projects in Puget Sound for the field course. However, they often struggle to master the data collection and analytical skills they acquire in this class with more basic skills and understanding about the scientific process.

Through hands-on activities, the “Scientific Process in Practice” seminar aimed to help students succeed in the field course and later science courses by:

1. developing information literacy skills
2. practice articulating testable hypotheses
3. studying the scientific format of presentation

Inquiry-based, skill focused seminar created a safe learning environment and helped student learning:

“A little lecture and then a group activity that is fun and easy going – help us connect to what we need to know and give us a stress-free environment to learn and expand.”

**Quote from student evaluation**

In addition to the traditional course evaluations (mid and end of quarter), we employed several assessment techniques to monitor students’ learning progress.

**Weekly quick write**

Students spent 3 min at the beginning of class to reflect on “What have you learned last week?” This approach helped students improve metacognition and made possible timely intervention.

**Pre and post course surveys**

![Survey Results](image)

Top) Students self efficacy in ability to conduct scientific inquiry on the scale of 1-5, with 5 indicating they strongly agree that they can efficiently carry out the task listed (Mean and standard deviation).

Students completed the Student Understanding of Science and Scientific Inquiry survey (SUSSI, 4) and a self-efficacy survey on ability to conduct scientific research (5). Significantly less effectiveness in self efficacy to conduct scientific research suggested that both classes created a great dissonance in students’ understanding of scientific inquiry (paired t-test, p<0.05). This decrease is likely an indicator of students being more reflective and therefore more self-critical.

**Assessments:**

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