RESEARCH SUMMARY

INSPIRING STUDENTS WITH INVESTIGATIONS IN SCIENCE

North Seattle College
SEATTLE, WASHINGTON

Steelcase Education Active Learning Grant Recipient, Cycle 3

Students watch a short video and read intriguing text from a scientific source – such as the recent discovery of mammoth blood in a frozen specimen. Then they collaborate with classmates on an interdisciplinary investigation (IDI) that involves brainstorming, drawing, analysis and communication – all focused on a topic, such as the way oxygen moves through hemoglobin.

North Seattle College professors Kalyn Shea Owens and Ann Murkowski piloted multiple modules of this engaging new curriculum of their own design – and brought it to life with an Active Learning Center (ALC) grant.

"There's nothing like doing real science in a lower level class to pique student's interest and give them a feel for real-world applications … [the experience] had a major impact on my interest in a research career and in chemistry in particular."

ALC Student, North Seattle College

WORKING TOGETHER

The professors' aim was to create a more contextual, active approach to teaching gateway courses in chemistry and biology. The new curriculum employs pedagogical strategies that require significant small group collaboration around drawings students create together.

Through classroom video captures, the professors documented the resulting learning encounters, showing how students identified questions, illustrated and debated ideas, and prepared to test their thinking on a complex challenge.

Professors also used video captures to reflect on their teaching practice and its impact on student behaviors. Some also noted their own behaviors in the new classroom, an informal, versatile space featuring mobile furniture and Verb personal whiteboards.

"The physical arrangement [of the ALC] is a constant reminder that what happens in the classroom is really about the students," said one full-time faculty member trying the new approach. "It forces me to constantly be asking myself how I could be having students engage with material. What could they draw? What could they discuss at their tables?"

MAKING THINKING VISIBLE

Using a four-point scale to rate purposefulness, disciplinary grounding, integration and creativity, professors

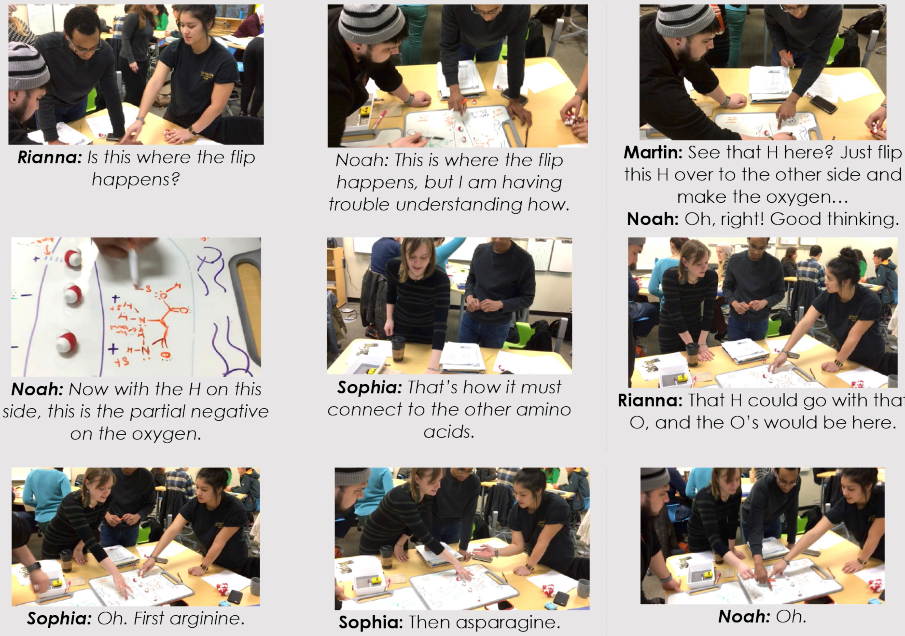
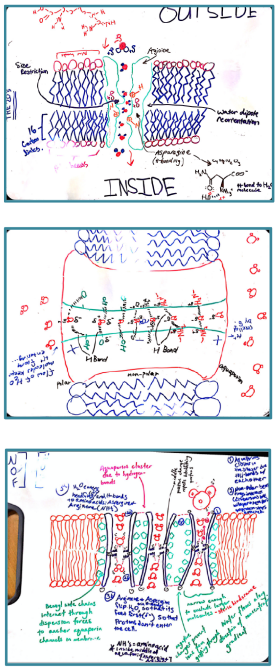


Figure 1

Segment of a Video Capture from the Aquaporin in Second Quarter General Chemistry Course.

coded 22 student drawings made during the first two sessions of class, comparing these to 22 more drawings the same students made during the second two sessions. Students showed progress in all categories.

"Drawing and the use of whiteboards [was] new to me," said another full-time faculty member. "I now bring out whiteboards for students to use in daily discussions and think-pair-share problem solving."



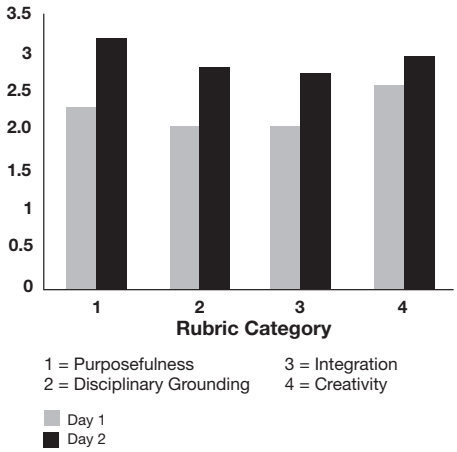


Figure 2

Using Student Drawings to Document Interdisciplinary Thinking. Student drawings were coded on a scale of 1-4 (1 = not present, 2 = novice, 3 = apprentice, 4 = mastery) and reported as an average for Day 1 and Day 2 .

This summary draws findings from an in-depth research report conducted by the featured grant recipient institution. For further information, contact steelcase@activelearningcentergrant.com.

REFLECTIONS ON LEARNING

Students in the general chemistry series who participated in an IDI lab were asked to reflect on their learning experiences by taking a survey administered nationwide. Students at North Seattle College report larger gains in self-confidence, tolerance for obstacles in research, readiness for more demanding research and other areas than the national average.

Students inspired by their learning experience in first-year STEM courses were invited to continue to develop their skills by enrolling in a year-long series of stand-alone undergraduate research courses taught exclusively in the ALC.

"The space has been transformative for engaging students in creative scientific work," observed the lead professors in their year-two report on the experience.

"The space has been transformative for engaging students in creative scientific work."

Professor, North Seattle College

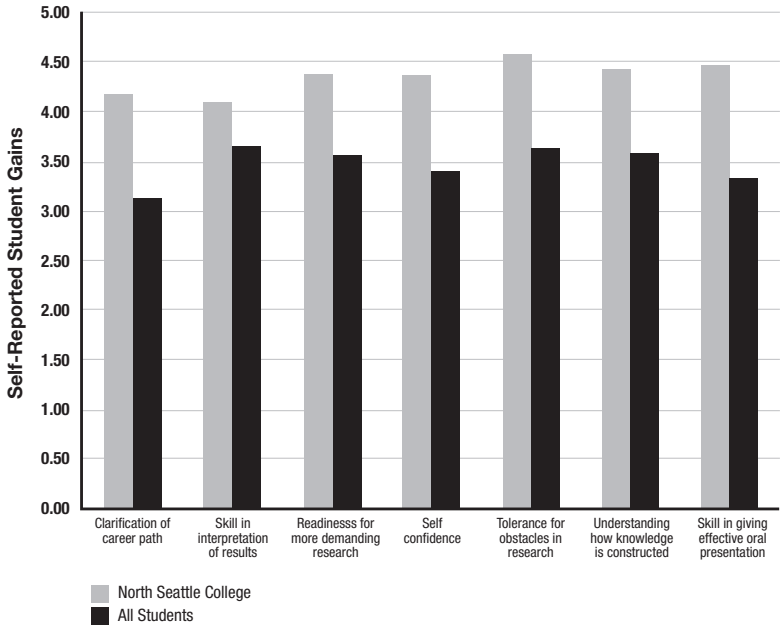


Figure 3

Cutline lead in to come. Cutline content to come if necessary.

This summary draws findings from an in-depth research report conducted by the featured grant recipient institution. For further information, contact steelcase@activelearningcentergrant.com.