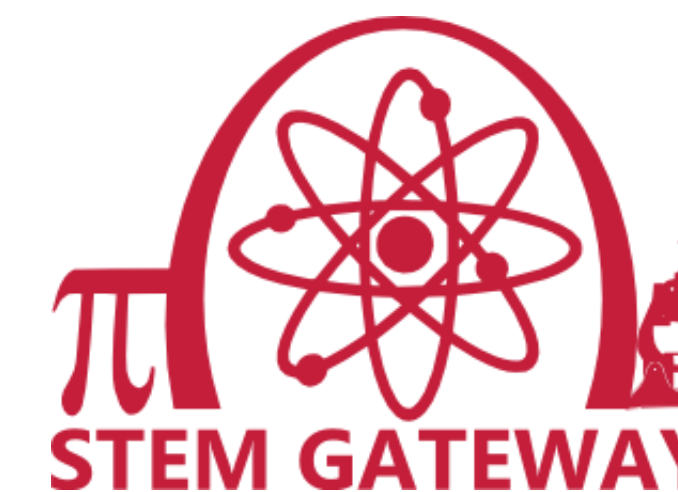


STEM Student Interest Groups (SSIGs): Connecting Learning in Gateway Courses with STEM Majors



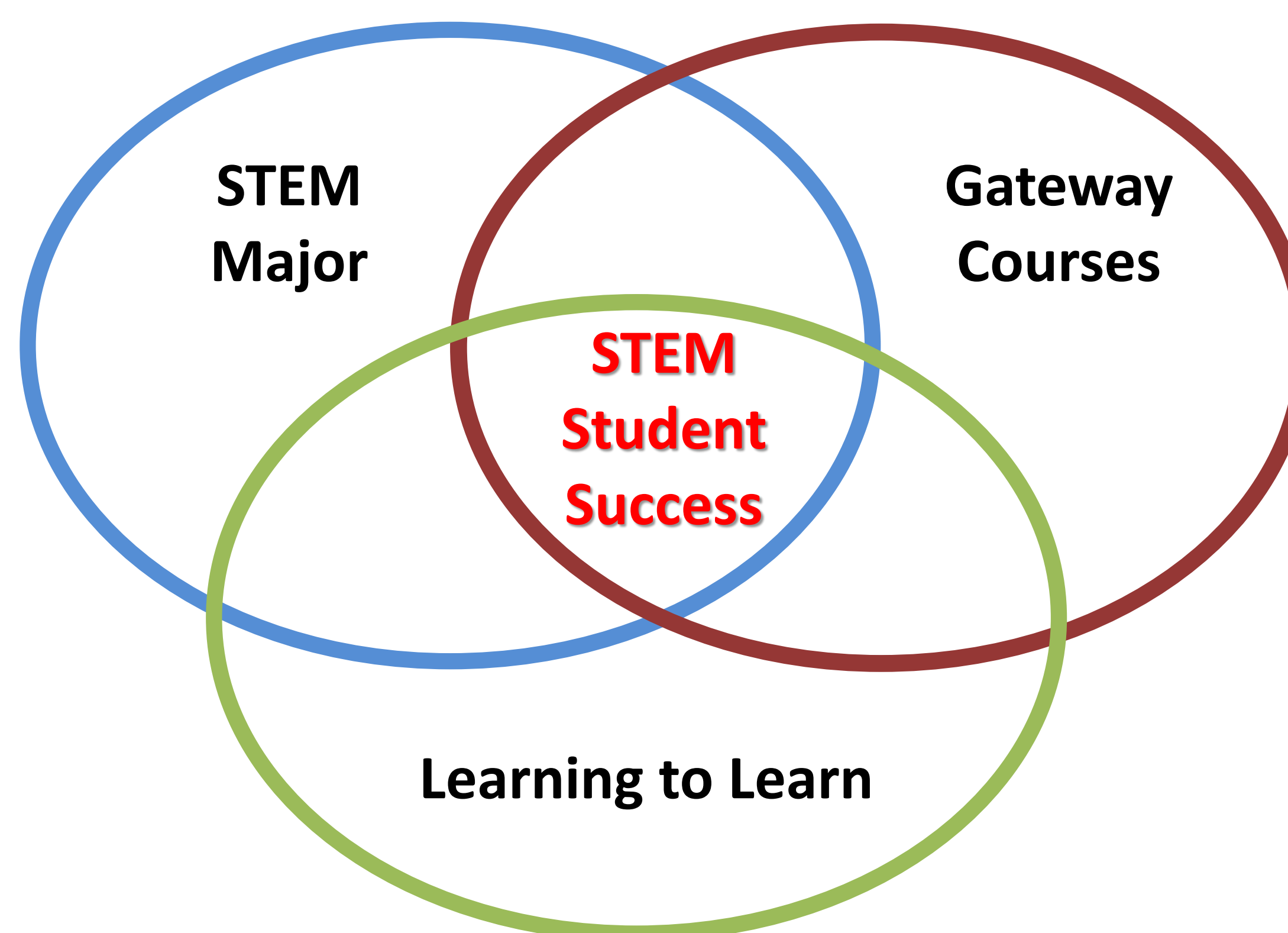
Angela Hung and Audriana Stark

SSIG Purpose

The SSIGs courses are designed to help students succeed in their gateway courses and increase retention for STEM majors. SSIGs accomplish this by...

1. Relating the material from gateway courses to students' major coursework
2. Guiding habits of mind in learning how to learn

*Gateway courses are prerequisites for science and engineering majors that are outside of students' major disciplines. These "Killer courses" are significant challenges to student persistence in science and engineering majors.



SSIG Outcomes

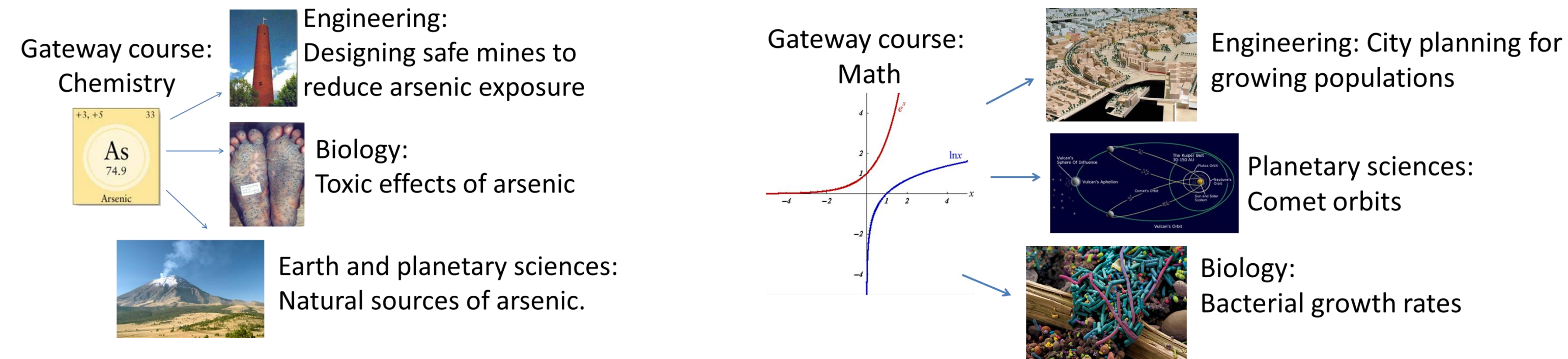
As a result of completing a SSIG, students will...

1. Be able to apply gateway-course concepts to one or more topical areas within the major field
2. Demonstrate the ability to analyze a problem in order to determine the type of thinking that is required in order to solve the problem
3. Demonstrate increased science literacy, which is the comprehension of and utilization of the conceptual process employed in understanding the natural world
4. Become proficient learners

Component 1- Connecting Major and Gateway Course

Seminar courses are taught by graduate TA's in the major disciplines. These classes emphasize active learning through the use of:

- In-class practice problems, individual and group work, class discussions, real-world application problems
- Lab visits, guest speakers, journals/blogs between class meetings
- Small class sizes for student-instructor and student-student interaction, student feedback
- Use major-to-gateway connections with Learning-to-Learn modules



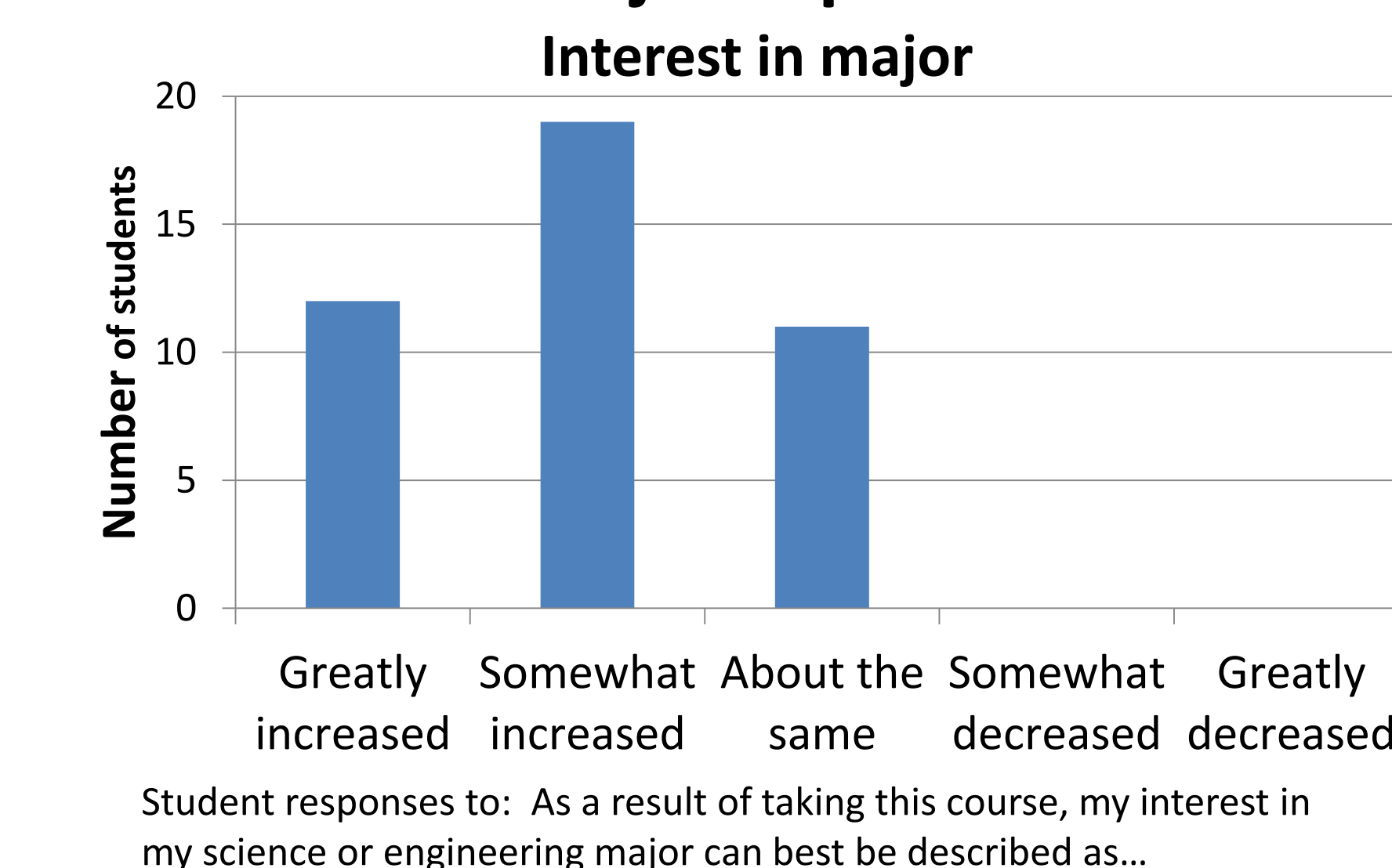
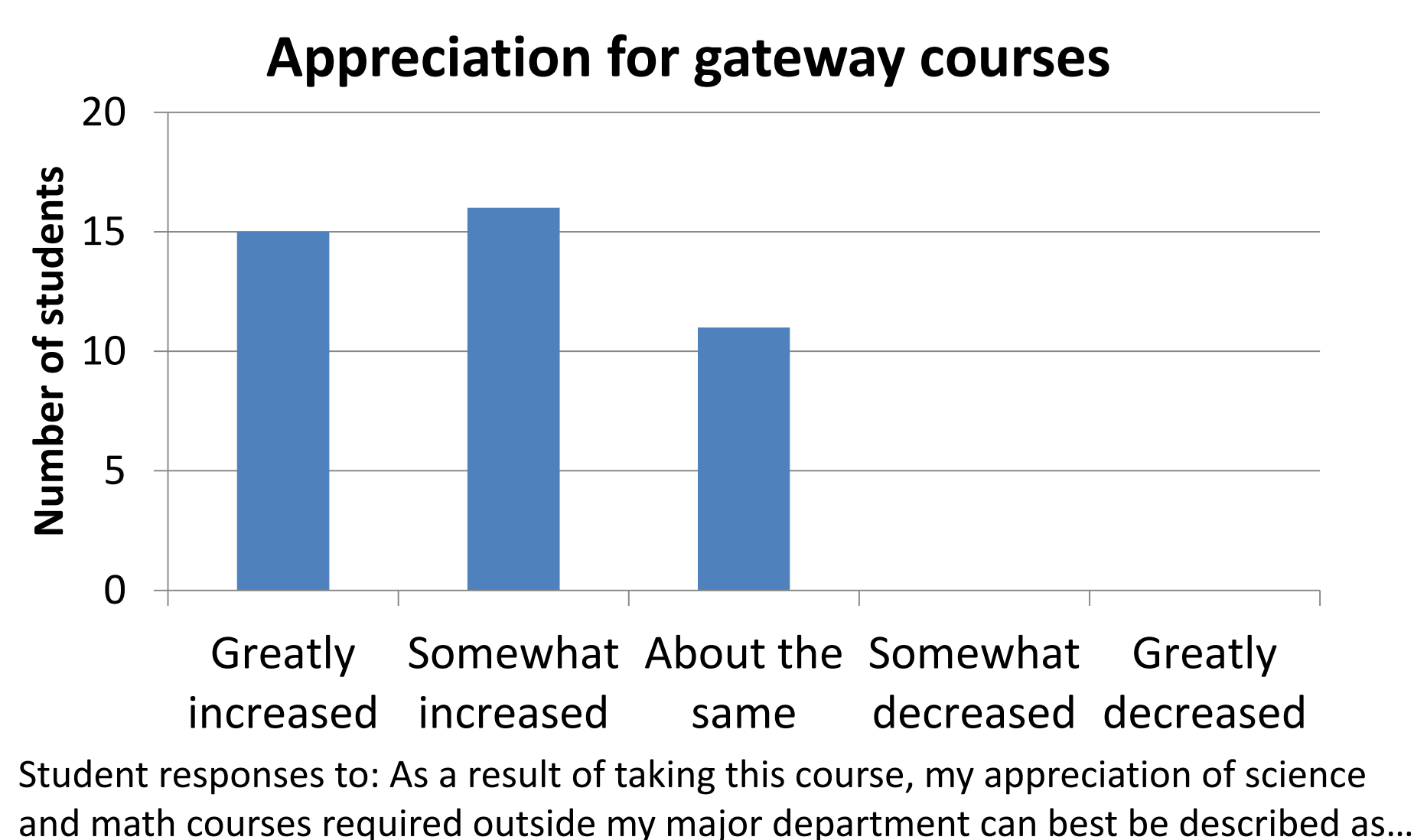
SSIGs also support students in their majors by providing professional development:

- paper reading/writing
- experimental design
- CV editing
- curriculum planning

Students are exposed to various aspects of their STEM majors earlier in their college careers.

Students' Responses to Relating Gateway material to STEM Major topics:

"What I liked about the course was the application of both scientific and mathematical equations to solve real-world problems and predict outcomes of the future."



"I liked how it showed how math, chemistry, and physics were connected. Seeing the connections has made learning easier and has showed me a purpose for each."

"The instructor had a holistic approach and was very versatile- by this I mean we could focus on chemistry in biology in interesting applications, but we also discussed increasing learning proficiency, graduate school, and research opportunities."

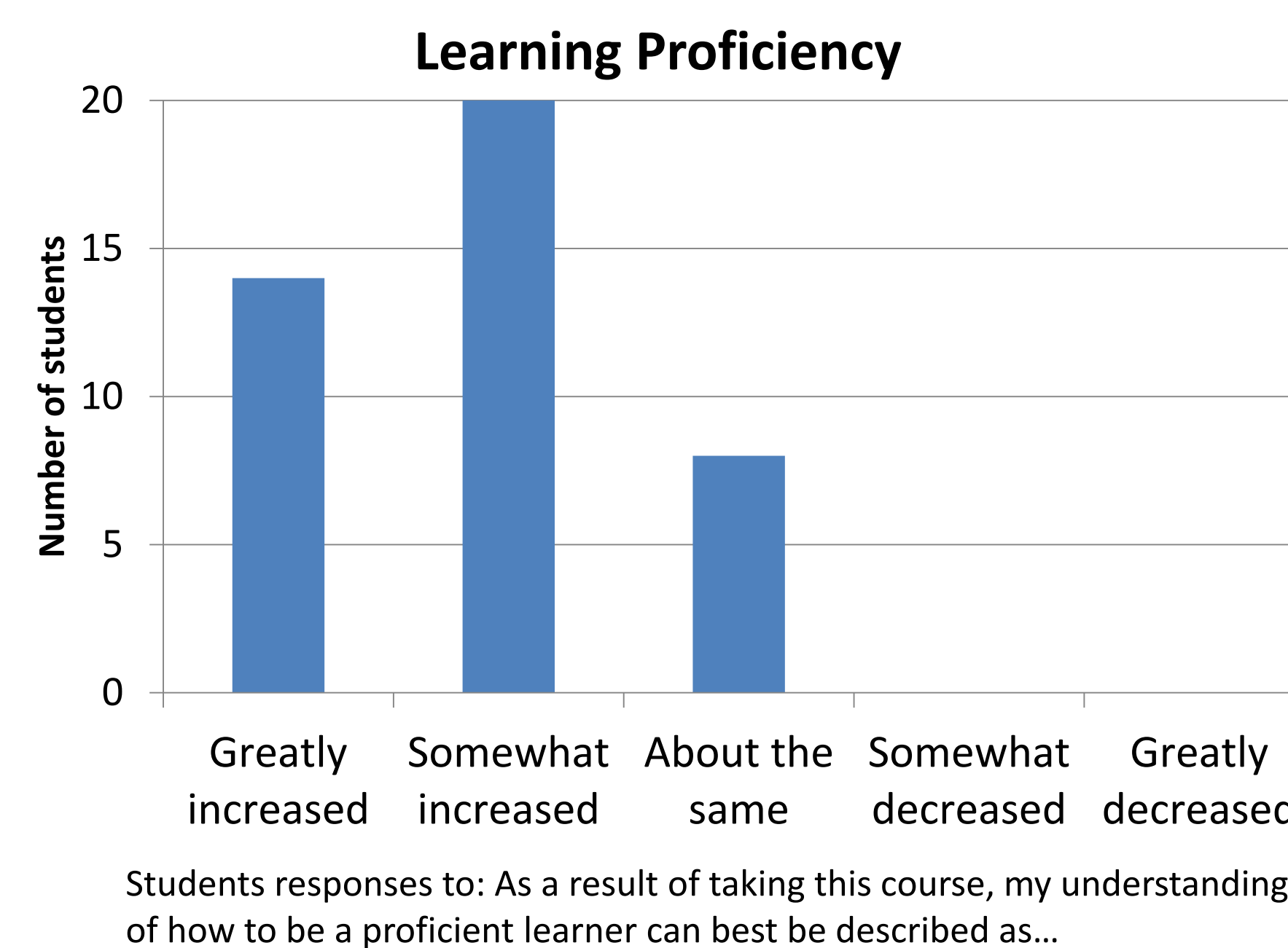
Component 2- Guiding Learning How to Learn

Lesson Plans:

- Metacognition: Determining What You Do and Do Not Know
- Recognizing the Required Thinking and Learning Using Bloom's Taxonomy
- Understanding and Adapting Learning Styles
- Polya's Problem-Solving Strategies
- Science Literacy
- Perry's Developmental Stages of the Brain

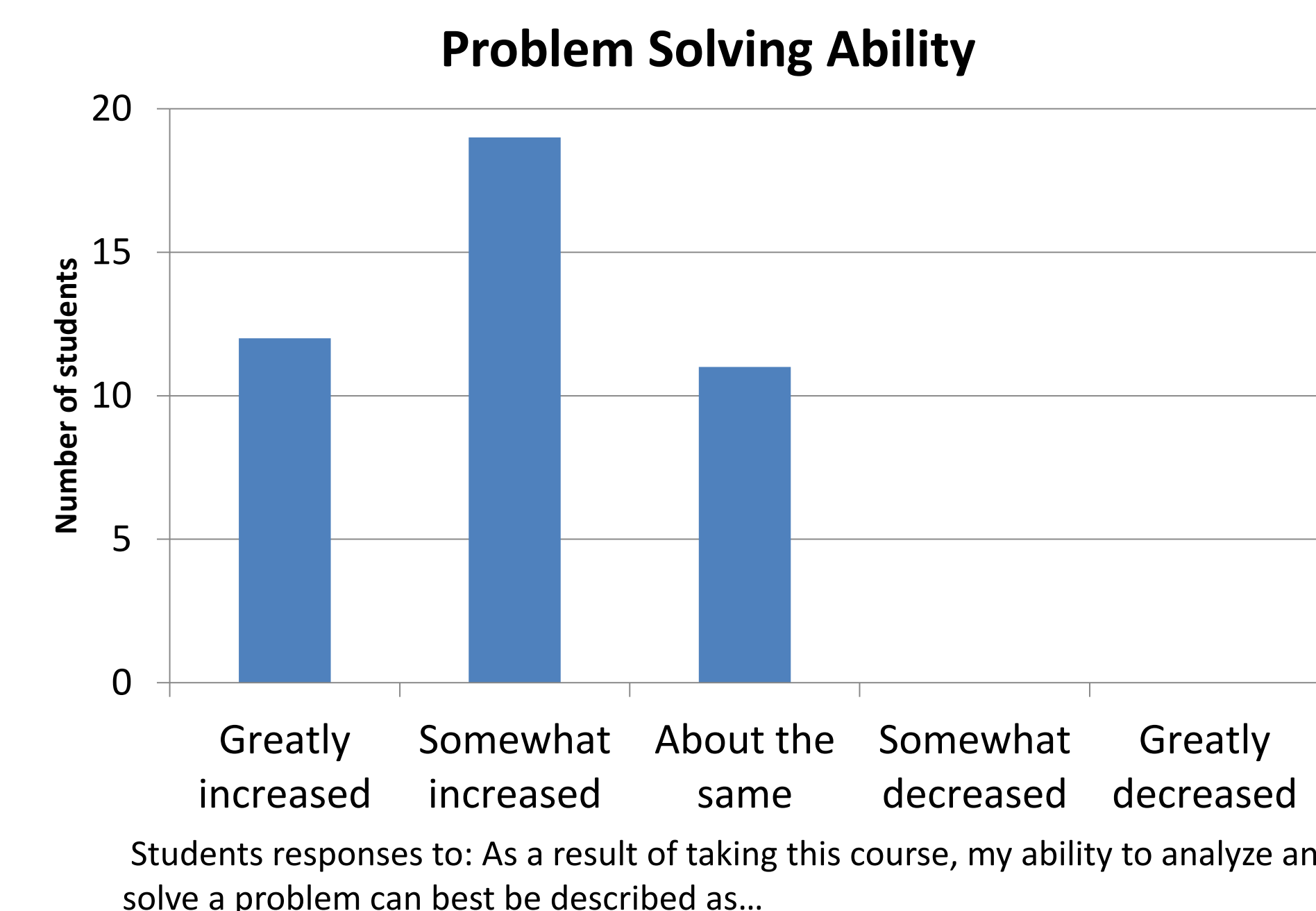
Students' Responses to Learning-to-Learn Strategies:

"My brain now appreciates ambiguity as a quality of the most interesting challenges. I have fun by discovering and using evidence."



"This week was actually really helpful for my college career. We went over metacognition strategies and also went over some math and a Mercury assignment. Going over these strategies has helped me realize I tend to be a "cram at last minuet (sic)" kind of girl when it comes to exams and homework at times and I really need to rectify that for my future as a student."

"I learned about how Polya's plan of problem solving helps you remember how and why you did on each step, especially in math problems. On the last step when you look back, if you got the wrong answer you will easily be able to see where you went wrong. It is a lot of trouble, but ends up being more beneficial in the long run, for homework and for studying."



"We went over the blooms taxonomy pyramid and while doing the reading I was immediately reminded of my college career. The apply section is like going from lecture to lab. I would love to get myself to the create section. I hope that I can get there and perhaps publish my research."