BREAKOUT SESSION: DEFINING THE STEM GATEWAY CURRICULUM TARGET OUTCOMES

Breakout Session Objectives

- Define the STEM gateway curriculum and experience.
- Identify the target outcomes for the STEM gateway curriculum and experience that integrate
  - crosscutting concepts and science practices
  - high impact practices (independent research, service learning, and study abroad)
  - the role of academic advisors.

Discussion Questions

Several comments on the pre-meeting survey described the need for communication between faculty from different disciplines as well as the need for communication between faculty and academic advisors. Several people also noted that they were unsure what constituted the gateway curriculum and experience. The goal of this session is to engage a diverse group of faculty and academic staff in productive discussions about the definition of and target outcomes for the STEM gateway curriculum and experience.

Crosscutting concepts are those that bridge disciplinary boundaries and have explanatory value in diverse settings. Science practices are the set of activities and approaches used to develop, extend, and refine scientific knowledge. The pre-meeting survey prompted participants to describe the crosscutting concepts and practices that are important for the STEM gateway curriculum. The results are summarized in Table 1. Please refer to this list to answer the questions about the role of crosscutting concepts and science practices.

The Gateway Curriculum

- The STEM Gateway curriculum includes the required, entry level, introductory courses in chemistry, physics, biology, and math. These courses prepare students for continued studies in STEM disciplines.
- Consider to what extent you agree with this definition. How can the definition be edited or improved?

The Gateway Experience

- The STEM Gateway experience includes collection of early experiences that students pass through on their way to obtaining a STEM degree.
- Consider to what extent you agree with this definition. How can the definition be edited or improved? What can be added to clarify this definition?

Gateway Target Outcomes

- What are the target outcomes for students participating in the STEM gateway curriculum and experience?
  - What roles do crosscutting concepts and science practices play in these target outcomes (see Table 1)?
  - What roles do co-curricular activities such as independent research, service learning, and study abroad play in these target outcomes?
  - What role does advising play in these outcomes?
- If students achieved these target outcomes would they be prepared for upper level STEM courses?

Notes from Discussion

We identified and discussed the following Gateway Target Outcomes.
• Students should be able to recognize crosscutting concepts and apply them to solve problems in multiple disciplines.

• Students should demonstrate an understanding of the ‘big picture’, i.e., how the disciplines are connected and the relevance of those connections.
  o Faculty need to have a better understanding of how the crosscutting concepts are taught in different disciplines.

• Students should be able to make informed decisions STEM careers based on a broad understanding of STEM-related opportunities.
  o The majority of science students are familiar with/interested in health related fields. Many students are not aware of the vast variety of STEM careers, including those in fields like Food Science and Nutrition and other majors in CANR.
  o Many students learn about other career possibilities late in their education. An effort should be made to expose students to this information during the gateway experience.

It was noted that developing comprehensive gateway learning outcomes would require a concerted effort by faculty from multiple disciplines and a considerable time investment.