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BOARD # 244: Generation of Peer Mentor Training Modules for Academic Makerspaces (NSF IUSE)

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Generation of Peer Mentor Training Modules for Academic Makerspaces (NSF IUSE)

This work outlines the course mapping structure of a training program focused on helping undergraduate peer mentors effectively assist first-year students in academic makerspaces, design courses, and laboratory classrooms. Student learning in unconventional learning environments such as makerspaces can be challenging, particularly if the learning requires the students to engage in teams to complete the non-traditional learning activities associated with project and problem-based learning.

The goal of the peer mentor preparation program is to provide undergraduate peer mentors with the knowledge, tools, feedback, and practice to develop skills to facilitate students enrolled in a first-year makerspace design course and support their learning in critical social and developmental areas.

The peer mentor preparation course contains six modules. For each module, this work maps out the taxonomy-based learning objectives, case scenario videos, and active learning exercises in support of the overall course goals. The digital learning modules developed and refined throughout this research project for University of Florida first-year engineering mentors will be openly shared with the larger STEM community for instructors at other institutions to utilize in their peer mentor preparation programs.

Methods and Developed Peer Mentor Course Format

Development of the content, style, and modules of the peer mentor training program was an interactive process involving faculty of the first-year makerspace course, research project faculty, advisory board members from four universities with expertise related to the project, and most importantly continual open input and needs assessment from peer mentors currently serving the related first-year makerspace design course.

Based on meetings with current design course peer mentors, the need for the developed training course to emphasize active-learning educational practices was a priority, so the format was tailored as a training for peer mentors through short educational materials, case scenario videos, and hands-on activities with small group discussions.

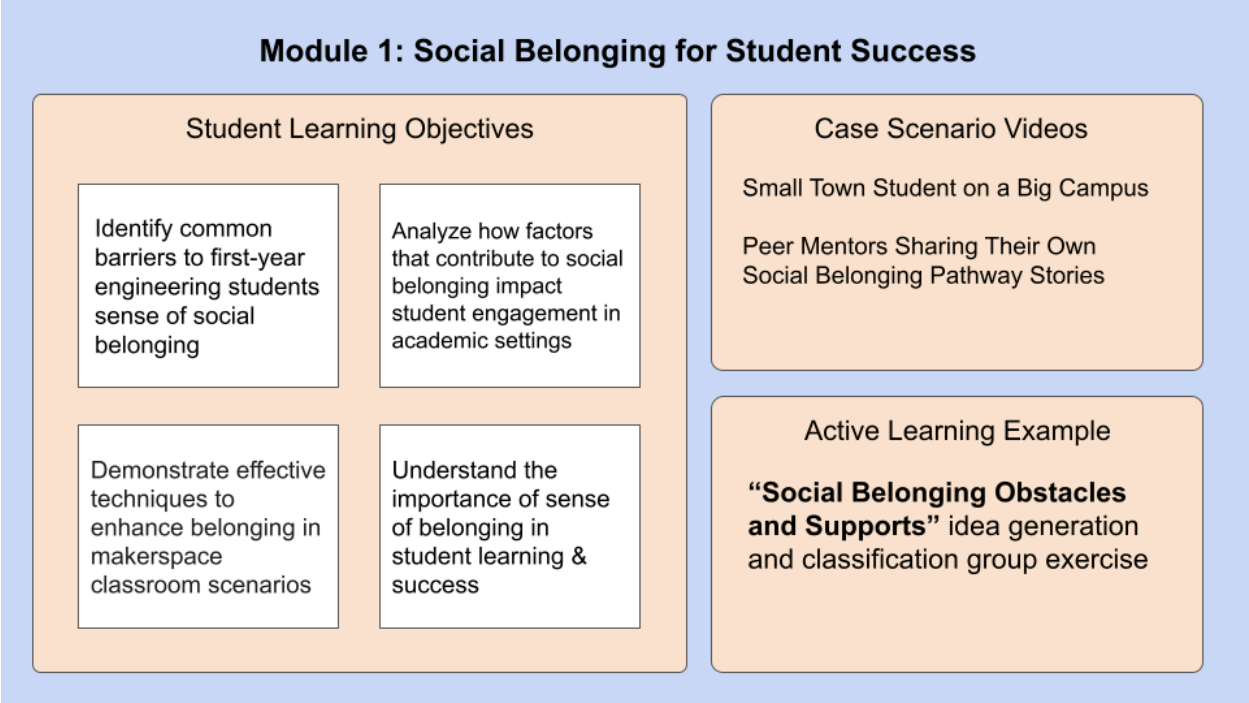
Delivery of the course is concentrated to either a two-day intensive training, or could be broken up into two weeks of six smaller training sessions (modules). Each module will consist of 1) presentation materials mapping learning objectives and the related

educational theories, 2) peer mentor created case scenario videos, and 3) an active learning activity that practices theories and case study topics from the module.

This short format is intended to be delivered at the beginning of each course semester, when students have returned to campus, in time for certification of new peer mentors, or as a refresher for returning peer mentors to be prepared to serve in the first-year makerspace classroom the same semester.

Results and Reflections

The results of the portion of the research project represented in this work is the educational mapping of the modules of content of the developed peer mentor training program. The most efficient representation of these course materials is module-by-module visualization of the student learning objectives, student developed case scenario videos, and active learning examples utilized as part of the makerspace classroom peer mentor training.



Module 2: How People Learn

Student Learning Objectives

Understand how to teach hands-on design & build concepts to peers utilizing multi-modal methods to increase comprehension and student knowledge retention

Demonstrate different teaching techniques to support a variety of learning styles relevant to the context of providing peer mentorship to design students in a makerspace

Case Scenario Videos

I Don't Understand, Show Me How to Do It Another Way!

Peer Mentor Real-Life Scenarios of Reframing Content

Active Learning Example

"How Many Ways Can You Explain This ?" idea generation and classification group exercise

Module 3: Fostering a Growth Mindset

Student Learning Objectives

Recognize a growth mindset versus a fixed mindset

Understand mentor responses to student success or failure to keep in growth mindset

Demonstrate techniques to foster a growth mindset in both individual students and design teams

Case Scenario Videos

Failing Forward - Breaking Stuff is Good!

Peer Mentor Real-Life Scenarios of Mentoring Students Towards Growth Mindsets

Active Learning Example

"The Exploding LED!" Role Playing Activity on Mentoring to Fail Forward

Module 4: Student Identity Development

Student Learning Objectives

Explain why successful student identity development is important as an engineering student

Practice classroom strategies to enhance development of student identity as an engineer

Articulate aspects of personal and academic identity, recognizing how individual strengths, values, and experiences contribute to educational and career aspirations

Case Scenario Videos

Using Formative Language to Build Student Identity While Mentoring

Peer Mentors Sharing Their Own Identity Development Stories

Active Learning Example

"What is an Engineer Made Of ?" idea generation and classification group exercise

Module 5: Effective Observing & Decision Making Techniques

Student Learning Objectives

Explain techniques for noticing, observing and decision-making in the classroom

Effectively identify key issues in a classroom scenario

Observe and identify key student behaviors, engagement levels, and areas of confusion, using systematic noticing techniques to inform timely classroom mentoring responses.

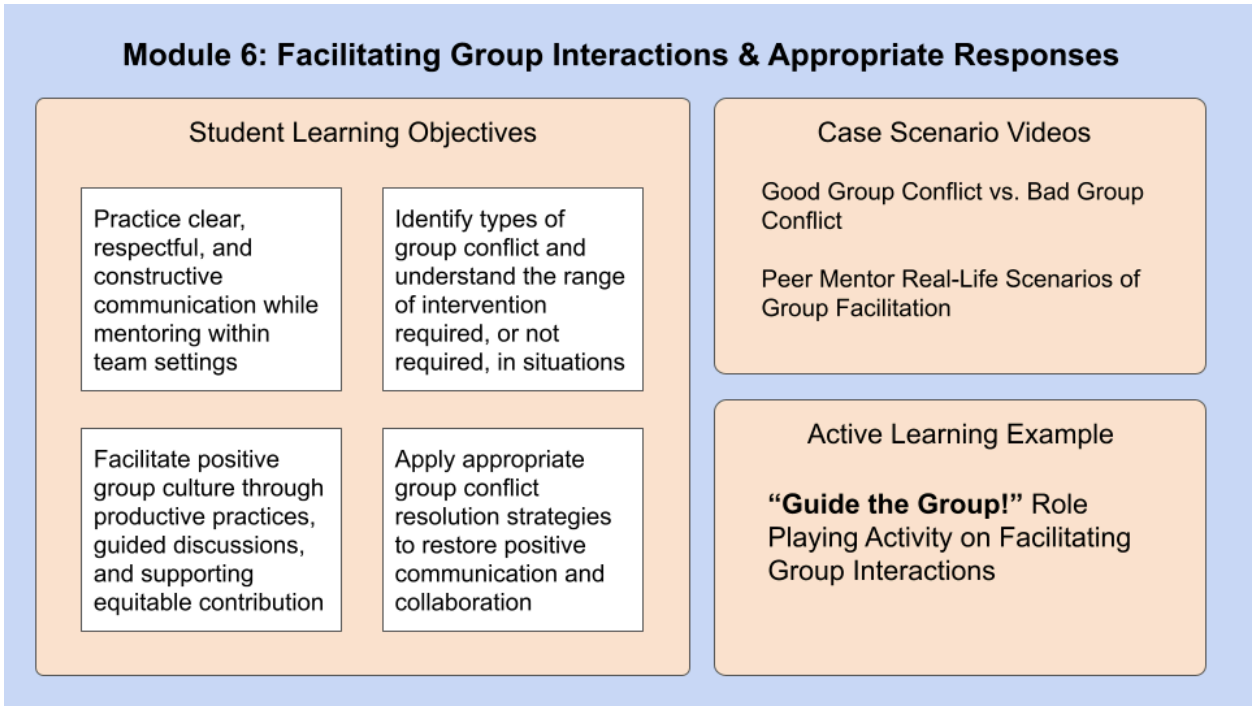
Case Scenario Videos

Subtle Signs of Student Need

Peer Mentor Real-Life Scenarios of Observation & Response

Active Learning Example

"Do You See What I See ?" Practice Activity on Classroom Observation and Response



Reflections

The open discussion with current peer mentors and their continual inclusion in course materials development resulted in a short course format that is efficient, engaging, and entertaining. Ownership of the course content and oversight of video creation was motivational for the junior and senior level peer mentoring students to create their own legacy in the course to pass their knowledge and expertise onto the next generation of mentors in a meaningful format. In implementation, the short course format with active learning portions at the beginning of the semester will also serve as a method for building stronger interactions and a community within the course peer mentors, both new and returning. WIth this training the peer mentors will be better equipped to serve the greater purpose of creating a welcoming and supportive environment for first-year student teams to create design projects and develop their identities as engineers within a makerspace classroom.

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