THE OHIO STATE UNIVERSITY

COLLEGE OF ENGINEERING

WIP: Mapping Entrepreneurial Minded Learning with the Longitudinal Model of Motivation and Identity in First-Year Engineering Courses

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Agenda

- Introduction
- Theoretical Framework
- Methods
  - Recruitment
  - Data Collection
  - Analysis
- Initial Discussion Results
- Next Steps

Introduction

- OSU is collaborating with KEEN to add multiple entrepreneurial minded learning (EML) elements to an existing first-year course

- This is the 1st phase of a 4-phase, 18-month pilot

- We explored the impact of EML in FYE classrooms on motivation and identity

- Purpose: To develop a curriculum that integrates best practices and examines the progress of student motivation, identity, engineering skillsets, and learning over their first year

Introduction

Phase 1: Exploration

Phase 2: Curriculum Development

Phase 3: Implementation and Assessment

Phase 4: Dissemination

Theoretical Framework

Longitudinal Model of Motivation and Identity (LMMI)

LMMI is a conceptual model that can be used to study individual development, incorporating the strengths of the well-established self-determination theory (SDT) and possible-selves theory (PST).

Self-determination Theory (SDT)

The various SDT constructs lead to increased motivation and identity development while each experience, such as EML, is based on one's own identity and views of themselves in the future.
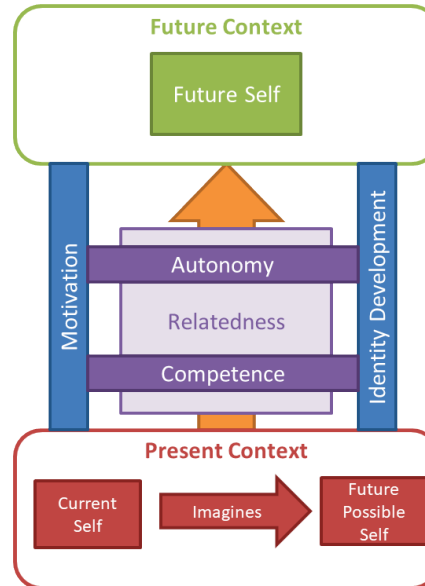
Possible-Selves Theory (PST)

PST serves as the foundation for the SDT constructs of competence, autonomy, and relatedness. PST allows individuals to set goals, think to the future, and envision themselves after completing some experience.

Figure 1: LMMI

Recruitment

We worked with KEEN network institutions to recruit first- and fourth-year students and faculty incorporating EML into their classrooms. We collected data from four sites in addition to OSU.

ID	Control	Size	Geographic Region	KEEN Membership
1	Public	Large	Midwest	New
2	Public	Large	Northeast	New
3	Private	Small	Midwest	Established
4	Public	Medium	West	New
5	Private	Medium	Midwest	Established

At each site we: (1) administered a survey to first- and fourth-year students, (2) performed focus group interviews with faculty, and (3) observed FYE classrooms that are incorporating EML

Methods

Convergent Mixed Methods Design

- Mixing at all phases: data collection, analysis, and discussion

- Collecting both qualitative and quantitative data simultaneously through focus group interviews, classroom observations, and surveys.

- Triangulation of analysis results in order to map findings to the KEEN framework and identify common trends of LMMI and EML in FYE
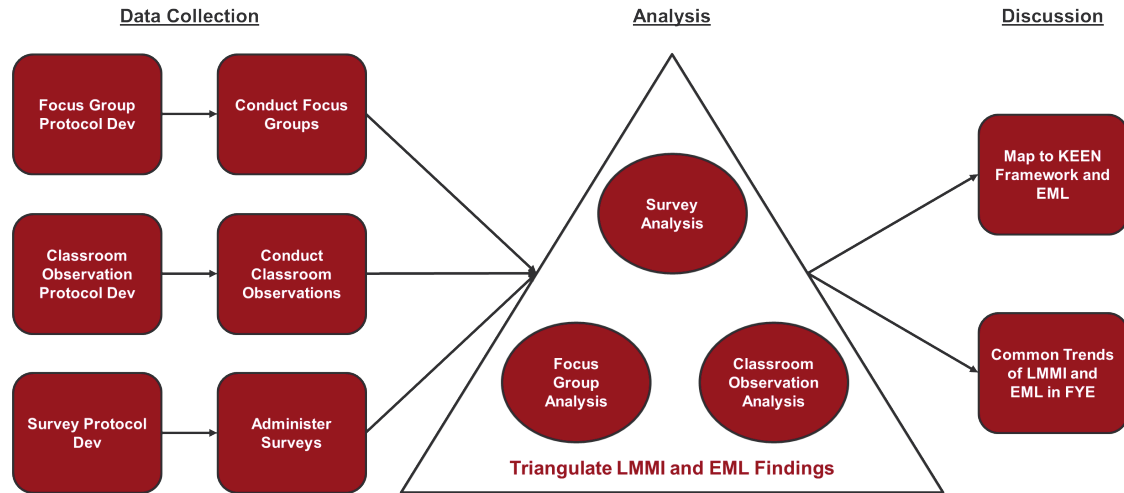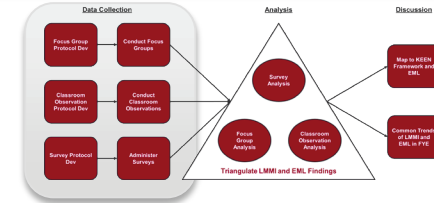

Figure 2: Mixed Methods Design

→ *This approach provided deeper insights into students' motivation and identity in EML classrooms.*

Data Collection

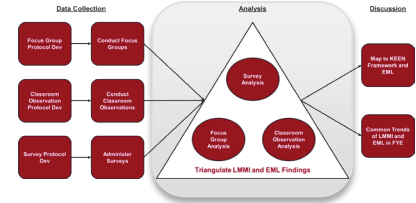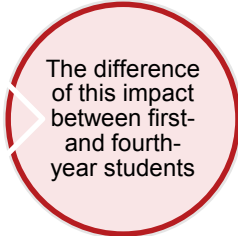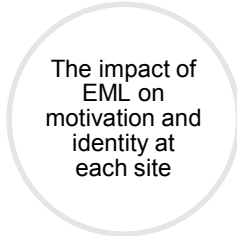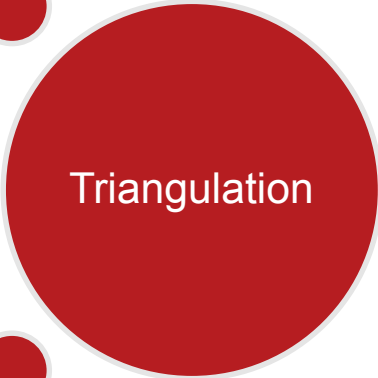|	
Focus Groups	• Semi-structured focus group interviews with FYE faculty who implement EML in their classrooms
Classroom Observations	• Observations of EML classrooms to note current engagement of EML practices, assessing the frequency of EML skills used (using the G-RATE tool) and how those skills were introduced
Surveys	• Surveys of first- and fourth-year students that assessed: • The KEEN Framework: 3C's of the Entrepreneurial Mindset (curiosity, connections, creating value) Engineering Skillsets (opportunity, design, impact) Educational Outcomes (collaboration, communication, character) • Motivation and Identity: SDT basic needs scale Modified possible-selves questionnaire

Analysis

EML Skillsets and Mindset results, and SDT and PST scores from student surveys

EML best practices from the faculty in the focus groups

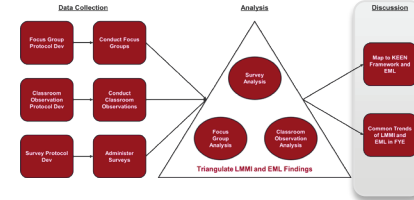EML engagement and frequency from observations of FYE classrooms

Triangulation

The impact of EML on motivation and identity at each site

The difference of this impact between first- and fourth-year students

Initial Results Discussion

- The KEEN/EML framework is often implicit in first-year courses: Parts of the framework may be included in learning objectives, but first-year students are generally not explicitly taught about KEEN/EML or the framework

- The schools institute a variety of project types: one semester long project, a set of smaller projects, or a hybrid approach

- All schools had their first-year students working with open-ended scenarios opposed to real clients, allowing students to build curiosity, problem solving ability, and life-long learning

- From the G-RATE tool, the *How People Learn* elements that were utilized the most were "Provided team activities", "Provided team assistance", "Provided thought-provoking questions", and "Provided verbal/written progress assessment"

- From the surveys, the students rated "Describe how a design could be scaled and/or sustained" and "Articulate the idea to diverse audiences" the lowest in almost all the school surveys

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Next Steps

- Continue analysis and mapping of results to KEEN Framework and EML, with focus on motivation and identity of FYE students

- Identify common trends of LMMI and EML in FYE in order to operationalize LMMI in the context of EML and future curricula development

- Develop a set of best practices that will be incorporated into EML projects, courses, and curricula during Phase 2.

Thank you!