Supporting Undergraduate STEM Students by Linking Experiences with Summer Bridge & Multi-Layered Mentorship

Lauren Griggs, Ph.D.
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- Blog
- Workshops
- Summer Labs On-Demand
- Resources
- Lessons Learned During COVID
- IUSE Proposal Preparation Toolkit
Supporting Undergraduate STEM Students by Linking Experiences with Summer Bridge

Penn State University

Lauren Griggs, PhD
Catherine Cohan, PhD
Carmen Vanderhoof, PhD

09/23/21
OUR “WHY” | GOALS & OBJECTIVES

Creating a welcoming, family environment that celebrates culture and inclusion

Improve the recruitment and retention of underrepresented students in the College of Engineering

Develop students both academically and professionally and through engagement in impactful leadership opportunities
## 2020 Engineering Summer Bridge | Demographic Characteristics

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Engineering Summer Bridge Program | Components

- Academic Preparation
- Peer Mentoring
- Campus Life Orientation
- Exploration of Engineering Majors
- Networking
Engineering Summer Bridge Program | Schedule

- Intense Review Session
- Pre-Calculus/Calculus
- Chemistry
- Metacognition
- Metacognition Facilitation
- Project Challenge
- Enrichments
- Weekly Quiz
- Weekly Evaluation
Engineering Summer Bridge Program | Benefits

- Higher GPA than non-participants
- More likely to graduate from the College of Engineering
- More likely to obtain competitive-salary internships, co-ops, and full-time employment
- Acclimate more easily to the college environment
- Build an extensive network of lifelong friends
- Develop effective learning strategies
- Earn college credit
- Stipend for successful program completion
- Reside in the Special Living Option during the academic year for First-Years in Science and Engineering
2020 Engineering Summer Bridge | Participant Identity Scores

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Note: Total N = 30. Scale range = 1 to 10.

## Engineering Summer Bridge Outcomes | Mattering

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Note: Total N = 31.

*Perceived Mattering Over 6 Weeks*

Cohan, Griggs et al. July 2021, ASEE Virtual Annual Conference. [https://strategy.asee.org/37793](https://strategy.asee.org/37793)*
Engineering Summer Bridge Outcomes | Sense of Belonging


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Note: Total N = 30.
What is your most significant take-away from the program as a whole?

• “Being able to gain knowledge and a relationship with those who have been through this before”
• “The friendships and professional relationships that I fostered throughout the program.”
• “The way many students and PAs were able to bond and connect with each other was very special. I thought it was amazing considering it was all through zoom.”
• “The sense of community that it created. The program helped make a supportive family going forward into the school year.”

~2020 Participants
Engineering Summer Bridge | Program Assistant Empowerment

- Academic
- Community Building
- Metacognition
- Robotics
Engineering Summer Bridge | Program Assistant Training

- Mentorship Training
- Counseling & Psychological Services (CAPS)
- Title IX/Violence Prevention
- Public Speaking
- Conflict Resolution
- Sense of Belonging
- Goal Setting
- Reflection
Program Assistant | Mentor Meetings

Mindful Reflection: Share your rose, thorn, and bud

**Rose**
A highlight, a success, or something positive that happened.

- What was a highlight today?
- How have you been successful?
- What are you most proud of?

**Thorn**
A challenge you experienced, or something you can use more support with.

- What was most stressful?
- Identify causes of difficulty.
- What made it hard to be successful?

**Bud**
New ideas or something you’re looking forward to knowing or understanding more.

- What are you looking forward to?
- Describe opportunities for learning that excite you.
- What needs growth and nurturing?

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2020 Program Assistant Reflection Comments

• “I LOVE your goals!!! You will accomplish EVERY SINGLE ONE!!! Speak it into existence!! Keep looking for your why as well! Oftentimes your goals will help shape your why. Once you find it, use it to drive and encourage yourself!! You will always have support in everything you do from your community! I promise that! I’m so proud of how far you have come!! You are going to be GREAT in college and beyond!!”

• “Everyone involved in this program wants to help and wants to see you succeed!! At Penn State, you will have your Summer Bridge community and you will also have your MEP community. In those communities, we really are all in this together!!! We will all help and guide one another to the top! We’ll all meet at the top someday believe that!!!”

~2020 Program Assistant Reflection Comments
Reflections | 20201 Program Assistant

Compare your experience in the program now, as a leader, with your experience in the program as a participant

2021 Program Assistant
Reflections | 20201 Program Assistant

Compare your experience in the program now, as a leader, with your experience in the program as a participant

“Everyone encouraged everyone. As a leader in this situation, I felt like I fit and that I belonged because I was bringing something to the table. It felt really nice to feel important to the program.”

~2021 Program Assistant
Key Takeaways

- Collaborative Goal Setting Assists in Program Value Alignment and Learning Outcome Development
- Program Assistant Focal Areas Contribute to Sense of Purpose, Belonging and Leadership
- Program Assistant Leadership Reinforces Sense of Belonging and Mattering (*Assessment in Progress*)
Engineering Summer Bridge | Team Acknowledgement

Lauren Griggs, PhD
Director

Aaron Mattingly, PhD
Assistant Director

Catherine Cohan, PhD
Assistant Research Professor

Carmen Vanderhoof, PhD
Assistant Teaching Professor
Funding Sources
THE LAYERED MENTORSHIP

UNIVERSITY OF COLORADO DENVER
COLLEGE OF ENGINEERING, DESIGN AND COMPUTING

MARYAM DARBEHESHTI, PH.D. MECHANICAL ENGINEERING
WILLIAM SCHUPBACH, PH.D. STUDENT & GRA
GREG SIMON, ED.D. STUDENT & GRA
TODAY’S PRESENTATION

• Introduction to our Context
• Structure of the Layered Mentorship Program
• Data Collection
• Data Analysis
• Current Research Focus
• Future Research
BUILDING AN ENGINEERING LEARNING COMMUNITY

History of the ELC
- Design Course
- Faculty Mentor
- Introduction of Shared Courses / A Cohort Model

NSF S-STEM Scholarship
- Bridge Week
- Mentorship Program
THE LAYERED MENTORSHIP PROGRAM

- Protégés
- Mentors
  - Lead Mentors
  - Graduate Team
  - Research Team
- Existing University Supports
UNIQUE FEATURES OF THE LAYERED MENTORSHIP PROGRAM

Intended to benefit all participating layers in the program through reflection and prediction

Protégés ← Mentors

Mentors ← Lead Mentors

Lead Mentors ← GRAs

GRAs ← Researchers
UNIQUE FEATURES OF THE LAYERED MENTORSHIP PROGRAM

Stable Research Data Collection
Emergent Data Collection Informing Iterative Design

Student Participants

Stable Research Data Collection
Research Team

Emergent Data Collection Informing Iterative Design
THE VALUE OF BEING BOTH A PROTÉGÉ AND A MENTOR
## FALL 2021

### PROTÉGÉ – MENTOR MEETING SCHEDULE

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DATA COLLECTION 2020

Engineering Learning Community
Urban STEM Collaboratory
Mentorship Program

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Member Name: <Last Name, First Name>

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Mentor Notes:
Write paragraph about your meeting. Give as much detail as possible.

Please rank and "v" each of the topics that came up during your meeting.
Academic Issues: ___
Time Management: ___
College Scans: ___
Social Issues: ___

On a scale of 1-10 (where 1 is least anxious and 10 is most anxious), what is the student’s current level of anxiety relating to COVID? ___

College of Engineering, Design and Computing
University of Colorado Boulder
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DATA COLLECTION 2021
ANALYZING THE EFFECTIVENESS OF THE LMP

Retention & Academic Performance

Comparison of LMP Participating and Non-Participating Engineering Students
## Retention Rates

<table>
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<tr>
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<th>No Participation in the LMP</th>
<th>Some Participation in the LMP (1 or 2 Semesters)</th>
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<tbody>
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<td>Fall 2019 Starting Population</td>
<td>123</td>
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<td>Total 2019 - 2020 Attrition</td>
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<td>Total 2019 - 2020 Retention</td>
<td>85</td>
<td>19</td>
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<td>Retention Rate</td>
<td>69%</td>
<td>83%</td>
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</table>
2019/2020
GRADE POINT AVERAGE COMPARISON

2019 - 2020 Academic Year GPA Comparison

Mentorship Program Participant: 3.287
Non-Participant: 3.122
EMERGING RESEARCH - THE PROCESS OF TRANSITION

"In giving advice and leading students when you're told to, it sort of leads into realizing that your advice is worth giving. In the first semester, I was unsure about how I would do as a mentor because I had never done something like it before. I learned over the course of the semester that the advice I had was worthwhile to the mentees receiving it and became more confident in giving it out. " – A Second Year Peer Mentor
FUTURE RESEARCH

Consideration of STEM Identity Development

Supporting Development Across the Stages - from Protégé to Mentor
Facilitated Breakout Rooms:

1. Navigate to the bottom of your screen and click “Breakout Rooms” button
2. Self-select into your breakout group based on your topic interest and last name

Note: If you do not see the Breakout Rooms button, please post in the chat to ask to be placed in a breakout room.
Discussion Breakout Room Recap

Carmen Vanderhoof
Cathy Cohan
Gregory Simon
William Schupbach
Lauren Griggs
Maryam Darbeheshti
Thank you for attending!

Slides and recording will be available in the coming weeks.

We value your feedback, please take a few minutes to complete the survey.

@IuseProgram  https://www.aaas-iuse.org  AAAS IUSE Initiative