The Inclusive Community-Based Learning Lab
at The Ohio State University,
Department of Engineering Education

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TheiCBLlab.com
1. The iCBL mission

2. Our Team

3. Our Projects
   - Empathy through CBL
   - Encounters with Difference in CBL
   - Understanding Reciprocal CBL
   - Engineering Career Attainment Inequities

4. Future Work

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The iCBL Lab aims to understand how Community-Based Learning (CBL) in engineering impacts students and participating stakeholders and communities.

The iCBL Lab seeks to promote CBL partnerships that pursue social justice and broaden participation in engineering. We develop evidence-based CBL that support the formation of engineering professionals poised to equitably impact society.

Partnering with Communities
While Developing Engineers
2. Our Team

**Nathan L. Harris**  
*Harris.2250@osu.edu*  
PhD Student  
NSF Graduate Research Fellow  
B.S. Computer Science, Morehouse College

Nathan works everyday towards **making change.** He has always recognized that he is his ancestors’ **wildest dreams** and the work that he seeks to accomplish both **honors those dreams** and looks forward to **future generations.** His NSF funded research focuses on the impact that **parental involvement** has on influencing Black students’ pursuits of computer science and engineering careers. Upon completing his PhD, he seeks to **consult for educational systems** that desire to implement STEM courses that are a **reflection and uplifts the culture of both the school and community.**

**Amena Shermadou**  
*Shermadou.3@osu.edu*  
PhD Candidate  
B.S., M.S Biomedical Engineering, Wright State University

Amena’s research interests are in exploring **cross-cultural interactions in diverse classroom environments.** Her dissertation research is examining how engineering students **make sense of encounters with cultural differences** while participating in international service-learning. Amena is seeking **tenure-track** roles in Engineering Education to become a **leading expert** on the dynamics of encounters with cultural differences in engineering in order to support the **advancement of a culture in engineering education that promotes inclusiveness and diversity.**

**Linjue Wang**  
*Wang.10961@osu.edu*  
PhD Student  
B.E. Architecture, Tsingua University

Linjue’s research focus is to develop **empathy skills** for engineering students who attend community-based learning. As an international student, she is also exploring how to **support the international engineering student community** through engineering education expertise. Her future goal is to conduct evidence-based research and practice on how to **improve the environment and curriculum structure of High Schools from rural areas of China** to get more exposed to engineering concepts and literacy.

**David A. Delaine**  
*Assistant Professor*  
*Postdoctoral Fulbright Scholar, Escola Politécnica da Universidade de São Paulo.*  
*Ph.D. Drexel University*  
*B.S. Northeastern University*

David is in pursuit of the career vision of **advancing community-based learning in engineering as a vehicle for social justice and the inclusion of marginalized communities in STEM.** David is a co-founder and past president of the Student Platform for Engineering Education Development (SPEED) and has served two terms as an executive member of the International Federation of Engineering Education Societies (IFEES) as a Vice President for Diversity & Inclusion. He seeks to establish himself as a leading scholar in **critical research on CBL towards transformational outcomes.**
Community-Based Learning (CBL) refers to any pedagogical tool in which the community becomes a partner in the learning (Mooney & Edwards, 2001).

Community Based Learning in engineering can be oriented towards broadening participation and social justice.

A critical approach to CBL, with an explicit focus on partnership, can inform practice that promotes social change.
Research Overview:

- CBL is explored as a platform for developing empathy in engineering by analyzing student CBL experiences through mixed methods.
- The ways in which CBL can be furthered as a tool for empathy instruction are established.

Project Highlights:

- The “Traveling Classroom” appears to impact CBL outcomes, where students sometimes behave as if they were in an engineering classroom expecting to be involved in traditional engineering teaching and learning.
- Ice breaking the ‘shock’ that students experience in CBL can support positive interpretation of “eye-opening” experiences. Students who are not “shocked” perceive experiences differently.
- With evidence-based adjustments, CBL can be a strengthened platform for Social-Emotional Learning including empathy. Scaffolding and support of integration is needed.

Model for Empathy in Engineering (Walther et al., 2017)

RQ1: To what extent and in what ways can CBL contexts expose undergraduate engineering students to empathy?

RQ2: Using contextual evidence from CBL and engineering contexts, what instructional tools can be designed to foster empathy in engineering through CBL?

RQ3: To what extent and in what ways do contextually adapted empathy modules support student development of empathy in CBL context?
Encounters with Cultural Differences in SL

Research Overview:

- Students find themselves underprepared to engage with others in the SL environment.
- Prior studies have warned that poorly implemented SL experiences can lead to unanticipated outcomes such as increased prejudice and stereotypes (Chesler & Scalera, 2000; Conner & Erickson, 2017; Gilbride-Brown, 2011).
- Learning outcomes addressing these critical interactions are often an implicit focus or not considered at all (Chesler & Scalera, 2000).

Project Highlights:

- Students struggle to "make sense" of encounters with cultural differences.
- Students face challenges managing situations of sadness, gratitude, uncertainty, etc., when working with SL community.
- Students do not reflect on the implications of their presence in the SL communities.
- Students of Color approach SL experience with a different mindset in comparison to classmates from majority groups.

RQ: How do engineering students make sense of encounters with cultural differences while participating in service-learning experiences?
RQ: What factors within a community-academic partnership support initiation in ways that promote an equitable distribution of power and voice?

Project Highlights:

- Three primary themes highlight ways to initiate CAPs embedded in equity: 1) Leaning on Prior Experience; 2) Operating Outside of Status; and 3) Promoting Cross Pollination.
- Collaborative Inquiry provides an appropriate methodology upon which CAPs can promote research, teaching, and community impact in equitable ways.
- Substantial work is needed in providing guidance and frameworks upon which engineering educators can initiate, develop, and maintain reciprocal CBL partnerships.
Research Overview:
- This work seeks to identify disparities in undergraduate engineering career attainment opportunities between Biomedical Engineering (BME) students and other engineering majors.
- An explanatory mixed methods approach will be used to develop an instrument informed by Social Cognitive Career Theory (SCCT) that measures undergraduate engineering career attainment influences.

Project Highlights:
- Three primary themes highlight ways to initiate CAPs embedded in equity: 1) Leaning on Prior Experience; 2) Operating Outside of Status; and 3) Promoting Cross Pollination.
- Collaborative Inquiry provides an appropriate methodology upon which CAPs can promote research, teaching, and community impact in equitable ways.
4. Future Work: Transformational CBL

Transformational CBL is characterized by the long-term impacts of mutually beneficial partnerships supporting growth of critical consciousness across all partners, while together systematically dismantling the root causes of the social ills requiring the need for SL in the first place (Mitchell, 2008).

Service-Learning in Engineering ➔ Transformational CBL

Transformational approaches to partnership in include deep and sustainable commitments, embody authenticity, and pursue benefits to all partners equally while all grow in their critical consciousness (Clayton et al., 2010; Butcher et al., 2011).

Transformational forms of managing power in can promote empowerment (Zimmerman, 1995) and change (Morton, 1995). Maximizing community impact requires engagement of community members, not merely as recipients of the service, but as partners in the design, implementation, and assessment.

Transformational outcomes are equitably distributed across all partners and, rather than seeking solutions that allow inequities to persist, outcomes pursued involve solutions to the root causes of the social ills (Clayton et al., 2010; Mitchell, 2008).

5. Partners

- The Charles Madison Nabrit Memorial Garden
- SHPE at The Ohio State University
- Toy Adaptation Program
- Department of Biomedical Engineering
- University Center for the Advancement of Teaching
- The Ohio State University National Society of Black Engineers
- The Ohio State University Honors and Scholars Center
- The Malcolm Jenkins Foundation
- Humanitarian Engineering Scholars
- EPICS in IEEE
- Engineering Projects In Community Service
- IFEES
- International Federation of Engineering Education Societies
- NSF
- Engineering Education Transformations Institute
- University of Georgia
Journal Publications:


Journal Manuscripts in Review: (Can be provided upon request)

- D. Delaine, “An Exploratory Model for Reciprocal Partnerships within a STEM Community-Based Learning Landscape developed through Case Study.” *Journal of Higher Education Outreach and Engagement*, in review.

- Thompson, D. Delaine, “Characterizing Service-Learning Partnerships in Engineering through the Perceived Experiences of Undergraduate Students”, *Journal of Community Engagement and Scholarship*, in review.


Journal Manuscripts in Development: (Can be provided upon request when completed)


Partnering with Communities While Developing Engineers
Publications in Conference Proceedings:


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7. Contact

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