Critical Approaches to Community-Engaged Engineering

Description

This page is a curated crowdsourced repository of materials that critically examine the premises, assumptions, values, and practices of community-engaged engineering, and that explore reflexive, justice-based alternatives. It features resources that critically examine the culture of engineering education and the engineering profession at large in order to provide insights into institutional mindsets and practices that may hold promise for or stand in the way of justice-based community-engaged engineering.

Abstract

The OEC Project Pages are intended to cultivate a community of practice and allow ethics researchers, educators, and practitioners to more effectively disseminate their work. This Project Page provides a detailed overview and relevant resources for an on-going science or engineering ethics project. Once you've explored this project, visit the "Projects" section under "Resources" to see more ethics projects.

Description

Interest in and institutional support for community-engaged engineering is proliferating. Projects bringing engineers into collaborations with diverse

communities appear under multiple banners, including 'Service Learning,' 'Humanitarian Engineering,' and 'Citizen Science.' Yet engineers are not formally trained to engage with communities: a vacuum that has been referred to in the literature as the "engagement gap" in engineering education. One consequence of this gap is that engineers are often left to their own devices to design and implement community-engaged engineering projects without tools that would support them to take into account the complex epistemic and socio-political terrains frequently intertwined with the technical problems they set to address. As a result, the design and implementation of community-engaged engineering projects tends to depend more on individual engineers' ideologies, preferences, and commitments and less on established standards of practice that aim to maximize community benefits while minimizing harms. This leaves engineers vulnerable to carrying out projects that misalign with community values, priorities, and needs and that communities ultimately experience as ineffective, undesirable, unsustainable, exploitative, or even harmful—epistemically, physically, psychologically, spiritually, socially, or politically.

Currently, community-engaged engineering is unregulated.

- No mandated oversight mechanisms exist to ensure that it meets basic principles of ethical practice, aligns with community goals, or is free of misuses and abuses of professional power.
- No protective systems have been put into place to make it possible for communities to report disagreements with, grievances against, or even harm from the community-engaged engineering projects affecting them, without risk of ostracization or retaliation.
- No mandated accountability procedures have been institutionalized that would trigger investigations of community complaints or necessitate community review of engineers' reports, publications, research proposals, funding awards, and recognitions pertaining to their community-engaged projects.

In other words, today community-engaged engineering tends to grant engineers unchecked power over the communities with which they engage and an effective monopoly over the narratives attached to their projects.

We view the current state of affairs as a serious problem for both engineers and

communities because it tends to create conditions of engagement that undermine the building of trust, compromise the generation of scientifically robust knowledge, and hamper the development of scientifically informed and politically impactful community action. In an effort to help foster new conditions of engagement, our OEC page will provide resources for engineers and communities alike that imagine and build toward justice-based community-engaged engineering. We define the latter as engineering that acknowledges:

a. The social injustices behind many of the technical problems engineering interventions aim to address,
b. The promise and ability of engineers to help communities redress such injustices through democratic knowledge-making, equitable collaborations of research and action, and respect for community rights and self-determination, and
c. The limits and limitations of engineering worldviews as well as the technical relevance and moral value of the worldviews of the communities engineers care to serve.

This page is a curated crowdsourced repository of materials that critically examine the premises, assumptions, values, and practices of community-engaged engineering, and that explore reflexive, justice-based alternatives. It features resources that critically examine the culture of engineering education and the engineering profession at large in order to provide insights into institutional mindsets and practices that may hold promise for or stand in the way of justice-based community-engaged engineering.

Through these resources, we hope to support the work of engineers and community members who are already collaborating equitably and in mutually elevating ways or who are committed to justice-based engagement but are looking for more information, inspiration, and guidance.

Our OEC page features not only our work but also the work of many others covering the following four areas:

- <u>Background</u>: Birth and philosophy of community-engaged engineering
- <u>Key terms</u>: Definition of concepts central to justice-centered community-engaged engineering (e.g., agency, community self-determination, local knowledge, power, informed consent, epistemic justice)

- <u>Resources</u>: Publications about justice-centered community-engaged engineering (our own and others')
- <u>People</u>: Names and contact information of individuals, programs, and/or institutions engaged in justice-centered community-engaged engineering.

Our page is populated with resources we deem useful, insightful, and important, but also with resources recommended to us by engineers, communities, scientists, social scientists, government agencies, and NGOs working toward justice-centered community-engaged engineering. Unless requested otherwise, contributor names will be featured as well.

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Relevant Links

- Reimagining Ethics Education for Peace Engineering: weef-gedc2018.org/wp-content/uploads/2018/11/47_Reimagining-Ethics-Education-for-Peace-Engineering.pdf
- Principles for Environmental Justice: ejnet.org/ej/principles.html
- Jemez Principles for Democratic Organizing: ejnet.org/ej/jemez.pdf
- LVEJO Academic Partnership Guidelines: lvejo.org/academic-partnerships/

Publications, Presentations, and Other Products

Lambrinidou, Y. 2018. When Technical Experts Set Out to "Do Good": Deficit-Based Constructions of "the Public" and the Moral Imperative for New Visions of Engagement [invited editorial]. *Michigan Journal of Sustainability* 6(1).

Bauschpies, W., Douglas, E.P., Holbrook, J.B., Lambrinidou, Y., and Lewis, E.Y. Reimagining Ethics Education for Peace Engineering. WEEF-GEDC 2018, Albuquerque, NM, November, 2018.

Lambrinidou, Y., Lopez, A., Pauli, B., and Riley, D. Core Values for Community-Engaged STEM Research. NAE Workshop on Teaching Research Ethics and Scientific Integrity, March 1, 2018, Chicago, IL.

Riley, D. "Power Struggle: Democracy, Technology, and Participation amid Aging Infrastructure." Plenary Lecture, Society for the History of Technology (SHOT). Philadelphia, PA, October 26, 2017.

Lambrinidou, Y., "Sustainable Engagement: Lead in Drinking Water and the Urgency to Reimagine Technical Experts' Relationship with the Public," Dow Sustainability Fellows Program, University of Michigan, November 18, 2017, Ann Arbor, MI.

Lambrinidou, Y., "Midwifing Revolution: From Technoscientific 'Rescue' Narratives to Transformational Change," National Science Foundation (NSF), Revolutionizing Engineering and Computer Science Departments (RED) Annual Grantee Meeting, July 10-11, 2017, Washington, DC.

Lambrinidou, Y. and N. E. Canney. 2017. Engineers' Imaginaries of "the Public": Content Analysis of Foundational Professional Documents, 124th American Society for Engineering Education (ASEE) Annual Conference & Exposition, Conference Proceedings (Paper ID #18325), June 25-28, Columbus, OH.

Katz, A., Riley, D., and Lambrinidou, Y. Shadow Codes of Engineering Ethics: An Experiment in Ethics Imaginaries. Association for Practical and Professional Ethics Annual Meeting, Reston, VA. February 19, 2016.

Lambrinidou, Y. and Riley, D. Engineers in the Public Interest: Histories, Models, and Future Directions. Association for Practical and Professional Ethics Annual Meeting, Reston, VA. February 19, 2016.

Lambrinidou, Y. 2016. On Listening, Science, and Justice: A Call for Exercising Care in What Lessons We Draw from Flint. *Environmental Science & Technology* 50(22):12058–12059.

Riley, D. and Lambrinidou, Y. Canons against Cannons? Social Justice and the Engineering Ethics Imaginary. ASEE Annual Conference, 2015.

Canney, N., Lambrinidou, Y, and Riley, D. (2014) Serving the public or the power elite? Narrow conceptions of 'service' and 'society' in engineering. Engineering, Social Justice, and Peace, Buenos Aires, Argentina, August 17-19, 2014.

Lambrinidou, Y., W. Rhoads, S. Roy, E. Heaney, G. Ratajczak, and J. Ratajczak. 2014. Ethnography in Engineering Ethics Education: A Pedagogy for Transformational Listening, 121st American Society for Engineering Education (ASEE) Annual Conference & Exposition, Conference Proceedings (Paper ID# 10155), June 15-18, Indianapolis, IN.

Nieusma, D. and Riley, D. Designs on Development: Engineering, Globalization, and Social Justice. *Engineering Studies* 2(1): 29-59, 2010.

Riley, D. *Engineering and Social Justice*. San Rafael: Morgan and Claypool, 2008.

Other Impacts

Our hope is that this OEC page will offer visitors not only informational material but also a) affirmation that critical approaches to community-engaged engineering exist and make up a growing body of research and practice, and b) a transdisciplinary platform for collaborative knowledge-, vision-, and community-building.

Rights

Use of Materials on the OEC

Resource Type

Projects

Topics

Collaboration
Community and Participatory Research
Ethics and Society
Public and Community Engagement
Research and Practice
Social Justice

Discipline(s)

Engineering
Research Ethics