Engineering Educators Bringing the World Together
2025 ASEE Annual Conference & Exposition
Palais des congrès de Montréal, Montréal, QC • June 22–25, 2025 ◆ASEE

Paper ID #48034

BOARD # 433: RED: Faculty Co-Create Community, Mentoring, Transformation

Dr. Lynne A Slivovsky, California Polytechnic State University, San Luis Obispo

Dr. Lynne Slivovsky is the Inaugural Chair of Computer Engineering at California Polytechnic State University, San Luis Obispo, California, USA.

Dr. Lizabeth L Thompson P.E., California Polytechnic State University, San Luis Obispo

Dr. Lizabeth Thompson is the Director of General Engineering and a professor in Industrial and Manufacturing Engineering. She has been at Cal Poly for 32 years and has held various positions on campus including Co-Director of Liberal Arts and Engineering Studies, Director of Women's Engineering Programs, and CENG Interim Associate Dean. Although she has taught over 25 different courses, she currently teaches Financial Decision making, First Year engineering, Senior Project, and Change Management. Her research is in Engineering Education where she has received $11.8 million of funding from NSF as either PI or Co-PI. She researches equitable classroom practices, integrated learning, and institutional change. She spent the 2019-2020 academic year at Cal State LA.

Dr. Jane L. Lehr, California Polytechnic State University, San Luis Obispo

Jane Lehr is a Professor in Ethnic Studies and Women's and Gender Studies and Director of the Office of Student Research at California Polytechnic State University, San Luis Obispo. She is affiliated faculty in Computer Science & Software Engineering and

Dr. Andrew Danowitz, California Polytechnic State University, San Luis Obispo

Andrew Danowitz received his PhD in Electrical Engineering from Stanford University in 2014, and is currently an Associate Professor of Computer Engineering at California Polytechnic State University in San Luis Obispo. His research interests involve student mental health and accessibility in engineering education.

Dr. Bridget Benson, California Polytechnic State University, San Luis Obispo

Bridget Benson received a Bachelor's degree in Computer Engineering at California Polytechnic State University San Luis Obipso in 2005, a Master's degree in Electrical and Computer Engineering at the University of California Santa Barbara in 2007 and a Ph

Dr. John Y Oliver, California Polytechnic State University, San Luis Obispo

Dr. Oliver is a professor of Electrical Engineering and Computer Engineering at Cal Poly, San Luis Obispo. His field of expertise is in computer architecture and system performance analysis, dabbler in cybersecurity and passionate about broadening pathway

Prof. Nina J. Truch

Prof. Truch is a lecturer in the communication studies department at Cal Poly.

RED: Faculty Co-Create Community, Mentoring, Transformation

Abstract

This paper provides insight into recent work of our NSF Revolutionizing Engineering Departments (RED) grant Breaking the Binary We are in a five-year process of transformation with the following goals: #1 Enhance critical consciousness and expand group capacity - Make visible personal and institutional structures and Grow faculty capacity for revolutionary justice-based change; #2: Interrupt structures that inhibit action - Deepen relationships between and among students, staff, and faculty and Heal from oppression; and #3: Dismantle and Reimagine - Identify and understand structures of oppression within, impacting, and impacted by the Computer Engineering (CPE) department and Ideate, prototype, and test alternative structures in a continual reflective process. Significant work this past year includes department-driven calls around supporting (new) faculty in their success, engagement, sense of belonging, and any other way (new) faculty might define their experiences in the CPE department. Faculty identified three key areas to be attentive to: onboarding (from informational to creating the conditions for transformation), mentoring, and community through facilitated dialogue sessions. We initiated research strands on the student experience and equitable teaching practices in our department. This paper and accompanying poster highlights key aspects of our work during the past year.

Introduction

Part of our work to transform our department into one that is equitable and just involved developing a model for change we call Critical Collaborative Educational Change, an iterative loop showing reinforcing relationships among critical consciousness, values and beliefs, actions, and collective well-being. Throughout our work we expect individuals to cycle through this loop, as will the entire group as a whole, as they are influenced by and situated within [1, p. 8] the broad contexts of our engineering department, STEM education, engineering practice, and society.

Our change model is based on two tenets. First, change and healing in any system begin with the individuals in the system changing and healing through reexamining assumptions and mental models, including beliefs and values. Second, since individuals make up a system and culture, as individuals change, heal, and re-engage, the system will also change and heal. Evidence suggests that a change process that begins with individuals' mental models—especially leaders' [2]—and that accounts for emotions and desires [3], is effective to successfully bring forth change in an organization.

While individual emotions and group differences in beliefs and values are always present during change processes, these differences are often implicit and unexamined. Reflective and generative dialogue, in service to both educational research and practice, and aligned with capacity building for critical awareness, action, and healing will make these differences and individual and group assumptions visible. As this process of healing is embraced within the department, we anticipate

changes in our policies, classroom pedagogy and content, and service. This paper shares the early pieces of our work.

Faculty Lead Change

Dialogue is a key component throughout all activities as described by our Critical Collaborative Educational Change model. We use collaborative inquiry—a technique that leverages participant experiences to address a question of interest [4], [5]—to establish a social space that actualizes the conditions for engaging in challenging discourse; integrates feeling and cognitive knowing in a holistic framework; and fosters critical reflectivity on embedded assumptions and premises [6]. We hold approximately three micro-retreat dialogue sessions per term with faculty and staff to individually and collectively expand our knowledge and capacity to engage with our change process.

One strand of collaborative inquiry we wish to highlight was a dialogue session in which we asked, "how we might create the conditions for new faculty to be successful, feel included, supported, or belonging, or any other way in which a new faculty member might define success for themselves?" What followed was an engaging session where faculty and staff generated a framework for new faculty to be successful. The discussion was guided and documented using a graphical facilitation process shown in Figure 1.
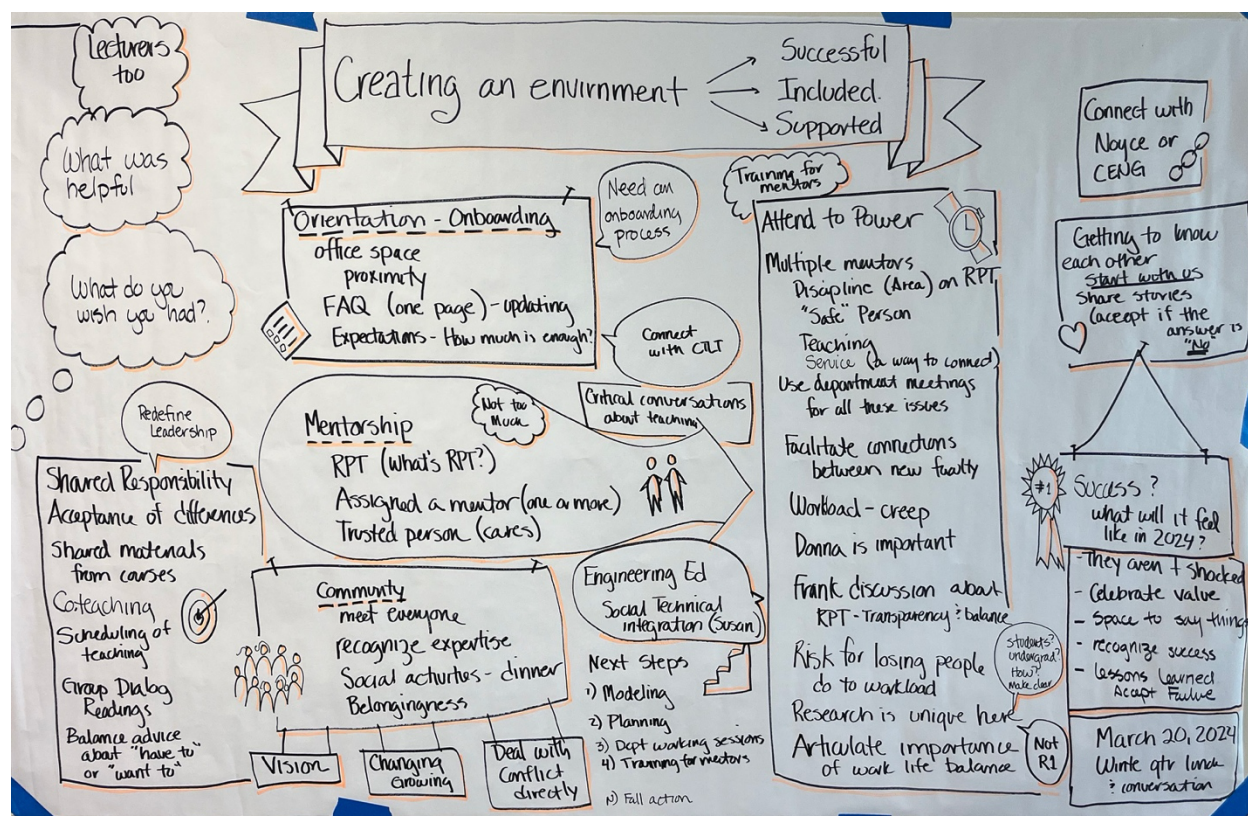

Figure 1. Graphic facilitation of a faculty dialogue session on how to support new faculty.

The conversation spanned many topics around community, power, mentorship, leadership, and collaboration. It gave the department and RED team guidance on where to place our attention in supporting new faculty. It also became evident that what we collectively thought was good for new members of the department was also good for all of us. We are currently focusing on community building and onboarding and mentoring new faculty.

The Student Experience

As we work to transform our department into a more inclusive and welcoming environment we look to identify and dismantle unnecessary and unjust barriers to student belonging and success and to eliminate achievement gaps among students from all backgrounds. As part of this effort, we have undertaken a study to determine which aspects of existing department and instructional culture students identify as providing the biggest obstacles to student success. We also try to identify areas of strengths in our department that can be leveraged as we complete our transformation.

To get a broad measure of how students were being served and stifled by our existing department structure, we created a survey from several pre-existing Likert instruments that were designed to measure different aspects of the student experience. We adapted an existing campus climate survey [7] to capture how students feel about the department and to measure their interactions with and impressions of department faculty. We also included an adapted version of the Science Identity Scale [8] to measure the extent to which our students identified as computer engineers. Additionally, we adapted an academic anxiety scale [9] and portions of the Diverse Learning Environments survey [10] focusing on educational challenges to help us understand how courseload and academic preparation were affecting our students.

Administering this survey was part of our baseline data collection. Results indicate a broad supportive and positive culture within the department. They also indicate areas in which students struggled including challenges in developing effective study skills, the prevalence of imposter system, and an indication faculty could do better in understanding the unique needs and abilities of each student.

Conclusion

Our project is working towards creating an equitable and just engineering department through, in part, a practice of collaborative inquiry and dialogue. As we individually and collectively interrogate our assumptions and beliefs and expand our knowledge about other ways of knowing and being, we have begun to see a quality of care emerge in our discussions – care about how we might support each other and ourselves.

Acknowledgement

References

[1] J. Butler, *Giving an Account of Oneself*. New York: Fordham University, 2005.

[2] A. Comeaux, *Change (the) Management: Why We as Leaders Must Change for the Change to Last*. Lioncrest Publishing, 2020.

[3] J. P. Kotter, *Leading Change*, 1R ed. Boston: Harvard Business Press, 2012.

[4] J. Herron, *Feeling and Personhood*. Thousand Oaks, CA: Sage, 1992.

[5] J. Herron, *Cooperative Inquiry: Research into the human condition*. Thousand Oaks, CA: Sage, 1996.

[6] L. Alcántara, S. Hayes, and L. Yorks, *Collaborative inquiry in action*. San Francisco: Jossey-Bass, Wiley, 2009.

[7] T. L. Renshaw, A. C. J. Long, and C. R. Cook, "Assessing adolescents' positive psychological functioning at school: Development and validation of the Student Subjective Wellbeing Questionnaire," *Sch. Psychol. Q. Off. J. Div. Sch. Psychol. Am. Psychol. Assoc.*, vol. 30, no. 4, pp. 534–552, Dec. 2015, doi: 10.1037/spq0000088.

[8] J. E. Stets, P. S. Brenner, P. J. Burke, and R. T. Serpe, "The science identity and entering a science occupation," *Soc. Sci. Res.*, vol. 64, pp. 1–14, May 2017, doi: 10.1016/j.ssresearch.2016.10.016.

[9] J. C. Cassady, E. E. Pierson, and J. M. Starling, "Predicting Student Depression With Measures of General and Academic Anxieties," *Front. Educ.*, vol. 4, Feb. 2019, doi: 10.3389/feduc.2019.00011.

[10] S. Hurtado and C. Guillermo-Wann, "Diverse Learning Environments: Assessing and Creating Conditions for Student Success - Final Report to the Ford Foundation," University of California, Los Angeles: Higher Education Research Institute.