MELISSA E. KO

mesako.github.io

EDUCATION

PhD in Cancer Biology, Stanford University, Stanford, CA — 2012 – 2018

S.B. in Biology, Massachusetts Institute of Technology (MIT), Cambridge, MA — 2008 – 2012

WORK EXPERIENCE

Assessment & Curriculum Design Specialist Center for Teaching & Learning (CTL), University of California, Berkeley	2022 – present

- Supported student learning outcomes assessment workflows for individual academic departments as part of the Academic Program Review process in support of institutional accreditation.
- Redesigned and led the launch of the Presidential Chairs Fellowship grant program with a focus on conducting Scholarship of Teaching and Learning (SoTL) at UC Berkeley.
- Designed strategies for program evaluation to determine the audience reach and impact of CTL workshops, consultations, long-term programming, and other services.
- Conducted surveys and focus groups, as well as analyzed and visualized data, to inform CTL planning and communicate both instructor and student needs to leadership.
- Queried and visualized institutional metrics such as student enrollment, demographics, and course-taking to inform CTL staff and leadership, drawing on the core CalAnswers data repository.
- Formed and mentored a team of undergraduate research assistants to support general CTL operations as well as engage in computational and analytical research tasks.
- Developed and led a new program evaluation service to generate evidence of impact aligned with client-identified goals, generating over $30K in additional annual revenue for the CTL.
- Consulted with instructors and institutional partners on a wide array of assessment needs.

Teaching Consultant Searle Center for Advancing Learning and Teaching, Northwestern University	2023 – 2024

- Recruited as an external consultant to support the Reimagining Assessment Practicum (RAP).
- Supported a variety of instructors across disciplines and course format to adapt equitable assessment and grading strategies to their teaching across over 40 one-on-one conversations.
- Facilitated quarterly small discussion groups ("learning labs") to share teaching values, brainstorm strategies for equitable grading, and solicit feedback in a supportive peer environment.

Data Analysis Consultant VMware Women's Leadership Innovation Lab, Stanford University	2023

- Process and analyze complex, longitudinal datasets to examine potential sources of gender promotion inequities in the tech worker corporate sphere.
- Generated a variety of visualizations including heatmaps and Sankey plots to represent trajectories of individual worker performance evaluations across time.

Science and Engineering Education Fellow (SEEF) Bioengineering Department, Stanford University	2020 – 2022

- Created the Course Design Equity and Inclusion Rubric tool from frameworks like Universal Design for Learning (UDL) and Culturally Responsive Teaching (CRT).
- Designed and led a department-wide undergraduate curriculum equity review process, including training cross-sectional course review teams and consulting with instructors.
- Designed course evaluation questions to assess dimensions of equity and inclusion.
- Supported major accreditation through assessment of program-wide learning goals using course evaluations, rubric review of capstone projects, and teamwork assessments.
- Analyzed complex student enrollment data to determine course-taking patterns (e.g. order, prerequisites) and trajectory of undergraduate students associated with bioengineering.

Lecturer Consultant Center for Teaching and Learning (CTL), Stanford University	2020 – 2022

- Co-designed and organized the new IDEAL Pedagogy program by crafting program goals, conducting departmental outreach, and coordinating program budget and hiring.
- Managed a small team of students in developing a central Canvas course site with curated inclusive pedagogy resources and asynchronous online learning activities.
- Created a tailored assessment and data collection plan to monitor change in instructor attitudes around the use of inclusive teaching strategies through pre- and post-surveys.
- Guided writing a land acknowledgement and inclusion statement for the CTL website.
- Developed pedagogy workshops to advance inclusive and effective teaching both in-person and online through the TEACH Stanford Pop-up Symposium.
- Served as lead in analysis of instructor datasets within CTL to identify programmatic needs and challenges associated with online instruction transition.

Instructional Design Assistant Vice Provost for Teaching and Learning (VPTL), Stanford University	2017 – 2018

- Synthesized research on diversity and inclusion in teaching, especially in an online format, from educational research articles and experts for content on VPTL's "Blended and Online Learning Design from Stanford" course.
- Authored the "Creating an Inclusive Learning Environment" section, outlining psychosocial phenomena that affect learning and tips for inclusive teaching in online/blended formats.
- Edited and curated inclusive teaching materials for CTL website such as first day practices, growth mindset, stereotype threat, and mental health accommodations, adapted from output of the "Identity in the Classroom" learning community.

TEACHING EXPERIENCE

Software/Data Instructor Trainer The Carpentries	2020 – 2022

- Facilitated multi-day pedagogical training for new Software/Data carpentries instructors, including discussions of cognitive load, learner motivation, and growth mindset.
- Designed and led two community workshops on delivering inclusive instruction in R/Python programming for CarpentryCon @ Home 2020.

Part-Time Biology Instructor Biology Department, Foothill College	2018 – 2022

- Designed lectures and in-class group activities for diverse student general education courses covering topics in ecology, genetics, cell biology, evolution, and more.
- Created flipped classroom-style homework and writing assignments to review terminology and concepts as well as encourage personal reflections between science and society.

R/Python Programming Workshop Instructor Software Carpentry, Stanford Libraries	2018 – 2022

- Contributed to design and implementation of a three-day intensive R programming bootcamp for incoming undergraduate researchers with open-source readings/exercises.
- Independently designed and taught several 2-hour workshops for Stanford affiliates on introductory R programming or using visualization libraries like ggplot2.
- Led two-day intensive workshops on introductory programming in R or Python while serving as a helper for Git and Shell lessons at both Stanford and UC Berkeley.

Lecturer ("Thinking Matters Fellow") Stanford Introductory Studies (SIS), Stanford University	2018 – 2020

- Fostered critical thinking through small group discussion and problem-solving activities in sections of 10-15 students in freshmen STEM courses like Breaking Codes, Finding Patterns, Living with Viruses, Our Genome, and The Cancer Problem.
- Designed assessments such as reading response questions, essay prompts, and problem sets to guide students in the development of reading, communication, and technical skills.
- Collaborated on a teaching team of fellows and faculty in the role of technology coordinator and lead course coordinator to deliver innovative course design.
- Spearheaded a centralized online resource of best teaching practices/materials for fellows.

Summer Course Instructor Stanford Summer Institutes, Stanford University	2019 – 2020

- Designed and simultaneously led two three-week courses on Big Data in Biology and Cryptography in a small seminar format for high school students.
- Prepared over 50 hours of class activities including lecture, code exercises, in-class debates, small group discussion, creative games, and problem-solving activities.
- Adapted an intro data science course that covers R programming and machine learning applications to an intensive, virtual two-week course for high school students.

Adjunct Lecturer	2019
Biology Department, Santa Clara University	

- Developed a comprehensive upper-division elective seminar course offered to biology and public health majors, covering cancer from biological, ethical, and societal perspectives.

MENTORING AND SERVICE

Book Club Co-Facilitator	2020 – 2021
Society for the Advancement of Biology Education Research (SABER)	

- One of over 30 trained facilitators leading a four-session, small-group book club on Dr. Ibram X. Kendi's *How to Be an Antiracist* and applications for anti-racist STEM teaching.
- Facilitated small-group book club on Dr. Susan D. Blum's *Why Rating Students Undermines Learning (and What to Do Instead)* as applies to STEM course assessment.

Grants Committee Reviewer	2019 – 2021
Vice Provost for Graduate Education, Stanford University	

- Served as grant committee member for Diversity and Inclusion Innovation Funds (DIF), reviewing program proposals for impact on diversity within graduate students and postdocs.
- Served as grant committee member for Diversity Dissertation Research Opportunity (DDRO), reviewing graduate student proposals across disciplines for impact on diversity.

Governance Board Member	2019 – 2020
Thinking Matters Program, Stanford University	

- Reviewed course proposals and past evaluation data to contribute to decisions on approving future courses and advising faculty in course improvements.

Co-Facilitator of Local Learning Community (LLC)	2019
Stanford University	

- Designed and led a series of five hour-long interactive group conversations around topics in self-reflection and inclusive course/program design adapted from Cornell University's Teaching & Learning in the Diverse Classroom online course.
- Independently guided follow-up meetings with initial LLC cohort and proposed adaptations of LLC model to other instructor audiences, leading to IDEAL Pedagogy program.

Program Assistant	2016 – 2017
Stanford Summer Research Program (SSRP), Stanford University	

- Mentored four underrepresented undergraduates individually and as a group.
- Prepared weekly workshops for mentorship group on choosing and applying to graduate schools, writing scientific abstracts, communicating science, and crafting presentations.
- Led program-wide discussions with over thirty scholars on diversity and identity in science.

Program Leader	2014 – 2015
ADVANCE Summer Institute, Stanford University	

- Mentored several incoming graduate students from multiple biosciences programs.

- Co-developed workshops/panels on networking/informational interviewing, career exploration, and resources and strategies for a successful science graduate career.

RESEARCH

Perceptions of Grading Among Undergraduate Students at UC Berkeley Ongoing Research, Center for Teaching & Learning, University of California, Berkeley	2024 – present

Collaborators: Jenae Cohn, PhD, and Rachel Weiher, PhD

- Designed and facilitated multiple focus groups with diverse undergraduate compositions to surface experiences, beliefs, and perceptions as relates to grading practices and learning.
- Created a novel survey instrument to reveal the relationship between mindset beliefs and beliefs around the purpose, utility, and impact of grading on students.

Assessing Anti-Racist Pedagogy at UC Berkeley Ongoing Research, Center for Teaching & Learning, University of California, Berkeley	2023 – present

Collaborators: Marisella Rodriguez, PhD, and Victoria Robinson, PhD

- Developed and analyzed surveys that revealed student perceptions of possible anti-racist pedagogical strategies and their impact on emotions and learning.
- Reviewed student written reflections on anti-racist pedagogy alongside an iteratively revised rubric to rate student conceptions of this practice across numerous dimensions.

Individual- and Course-Level Predictors of Student Buy-in to Active Learning Postdoctoral Research, Bioengineering Department, Stanford University	2020 – present

Collaborators: Mathew Williams, EdD and Brian Sato, PhD

- Conducted large-scale visualization and modeling on survey data from over 10,000 students to identify predictors of student buy-in towards active learning behaviors.

Social Network Analysis of Community College Faculty Professional Development Postdoctoral Research, Bioengineering Department, Stanford University	2019 – 2023

Collaborators: Jeff Schinske, MS and Lisa Corwin, PhD

- Analyzed surveys of self-reported attitudes and interconnections from a community college professional cohort aiming to develop biology education research projects.
- Generated network visualizations and graph metrics to investigate meaningful sources of support that correlate with professional outcomes of cohort members using R.

Computational Strategies to Elucidate Non-Genetic Resistance Mechanisms to Anti-Cancer Therapies Using Single-Cell Mass Cytometry Data Graduate Research, Cancer Biology Program, Stanford University	2013 – 2018

Advisors: Garry Nolan, PhD

SCHOLARSHIP

Publications:

*Bender, EC & ***Ko, ME** (in press). Dispatches from the Interface: Assessment Professionals in the CTL. *Transformative Dialogues: Teaching and Learning Journal.*

Weatherton, M, **Ko, ME**, Nichols, EL, Krishnan, S, & Faber, C (in revision). All In: Understanding and Motivating Stakeholders to Create an Equitable Culture of Student Success. *CBE—Life Sciences Education.*

Musgrove, MMC, **Ko, ME**, Schinske, JN, & Corwin, LA (2024). Broadening Participation in Biology Education Research: A role for affinity groups in promoting social connectivity, self-efficacy, and belonging. *CBE—Life Sciences Education*, 23(1), ar8.

Ko, ME (2023). The current landscape of faculty developers in scholarship of teaching and learning across diverse campuses in the United States. *Innovative Higher Education*, 48(6), 1009-1032.

Segura-Totten, M, *et al*. (2021). Chronicling the journey of the society for the Advancement in Biology Education Research (SABER) in its effort to become antiracist: From acknowledgement to action. *Frontiers in Education*. 6:780401.

Ko, ME (2021). Revolutionizing grading: implications on power, agency, and equity. In *2021 ASEE Virtual Annual Conference Content Access*.

August SE, Menezes G, Bouchey B, Chevillle, A, and **Ko ME** (2020). An ecosystem intersecting humanities, computational, and engineering disciplines with cultural and other assets of our communities. STEM Futures Project. **Non-peer reviewed.**

*Su, Y & ***Ko, ME** e*t al*. (2020). Multi-omic single-cell snapshots reveal multiple independent trajectories to drug tolerance in a melanoma cell line. *Nature Communications*, 11(1), 2345.

Dolan E, *et al*. (2020). Undergraduate biology education research Gordon research conference: A meeting report. *CBE—Life Sciences Education*, 19(2), mr1.

*Teh CE, *et al*., ***Ko ME** (2020). Deep profiling of apoptotic pathways with mass cytometry identifies a synergistic drug combination for killing myeloma cells. *Cell Death & Differentiation*, 27(7), 2217-2233.

***Ko ME** & *Williams C *et al*. (2020). FLOW-MAP: a graph-based, force-directed layout algorithm for trajectory mapping in single-cell time course datasets. *Nature Protocols*, 15(2), 398-420.

Salari, K *et al*. (2012). CDX2 is an amplified lineage-survival oncogene in colorectal cancer. *Proceedings of the National Academy of Sciences*, 109(46), E3196-E3205.

*authors contributed equally

Selected Oral Presentations:

"Summer Reset: Jumpstart Your 2024-25 Evaluation" and "Let's Start Fresh: Spectacular Failures in Educational Development." Virtual Gathering of Educational Developers. June 2024.

"Alternative Grading as a Gateway to Effective Program Assessment." The Grading Conference. June 2024.

"Students as Partners: Leveraging Learning Models to Advance Assessment." WSCUC Annual Accreditation Resource Conference (ARC). April 2024.

"Envisioning Assessment: Remote Dive into a Wicked Problem for CTLs." POD Online Conference. November 2023.

"The Grading Struggle: Balancing Compassion for Students and Self." Virtual SoTL Summit. September 2023.

"Alternative Grading as Liberation: Exploring Impacts on Equity through New or Different Assessment Methods." Peralta Online Equity Conference. April 2023.

"Should I go? Unpacking the faculty experiences leading to attrition." POD Network Annual Conference, Seattle, WA. November 2022.

"Using Shiny Apps to Build Quantitative Reasoning in Biology Education Contexts." American Society for Microbiology Conference for Undergraduate Educators (ASMCUE) Virtual. June 2021.

"Change and Accountability: Using an Equity Rubric to Inspire Department Engagement and Course Improvement." Peralta Online Equity Conference. April 2021.

"Enhancing Ethical Thinking in Bioengineering Undergraduate Education" Roundtable Discussion, SABER West Regional Conference. January 2021.

"Structuring Learning through Canvas: A Case Study from a Single Virtual Data Science Bootcamp." 2020 National Workshop on Data Science Education Virtual Conference. June 2020.

"Reproducible Analysis in R" Workshop. SABER West Regional Conference, UC Irvine, CA. January 2020.

Invited Talks and Panels:

"Equity-Minded Assessment." UC Assessment Practitioner Pre-Conference Workshop. April 2024.

"Notes from a Grading Skeptic." Professional Development Day, Peralta Community College District. August 2023.

"Equity and Inclusion in Alternative Grading." The Virtual Grading Conference. June 2023.

"Curriculum Redesign for Equity." Science Faculty Institute for Teaching and Learning (SFIT) Workshop, College of San Mateo. November 2022.

"Rethinking Grading." Professional Development Day, Peralta Community College District. August 2022.

"Aligning Instruction to Values: Ethical Reasoning in STEM Undergraduate Education." Ethics, Society, & Technology Unconference, Stanford University. May 2021.

"Exploring Alternative Systems for Grading." Experiments in Learning, Center for Teaching and Learning, Stanford University. May 2021.

"The Many Pathways to Data Science" and "The Data of Life Sciences" Panels. Annual Community College Data Science Conference. May 2021.

"Curriculum Equity Review within the Bioengineering Department." ASEE Breakfast Chat, Stanford University. March 2021.

"Grading for Equity: Contract Grading in the College Classroom." STEM Lecturer and Teaching Staff Meeting, Stanford University. November 2020.

"Redesigning BIOL 12: Human Genetics for Equity and Social Justice Dialogue." Learning Communities Showcase, Foothill College. September 2020.

"Big Data Meets Art: Using Visualizations to Unravel the Mystery of Drug Resistance in Cancer." BIOL 101 Seminar, Santa Clara University. May 2019.

Selected Poster Presentations:

"A Rose By Any Other Name: Alternative Grading Systems as a Gateway to Authentic Assessment." Association for the Assessment of Learning in Higher Education (AALHE) Annual Assessment Conference, June 2024.

"Identity, Place, & Context: Factors that Predict Student Buy-in to Active Learning in STEM Courses." Gordon Research Conference on Undergraduate Biology Education Research, June 2023.

"Investigating Professional Social Networks to Improve Research Productivity Among Community College Instructors." SABER Annual Meeting 2021 Virtual, July 2021.

"Creating Pathways to Change: Professional Development Options in Inclusive Pedagogy." Virtual Transforming Institutions Conference, Accelerating Systemic Change Network (ASCN), June 2021.

"Identifying Individual and Instructional Factors that Predict Student Buy-in for Active Learning Practices." X-DBER Conference, University of Nebraska-Lincoln (UNL), March 2021.

"Department Review of Inclusive Course Design for Continuous Improvement." National Dialogue on Transforming STEM Teaching Evaluation in Higher Education, NASEM, January 2021.

"The Thinking Matters Fellowship: A Transitional Teaching-Focused Experience Serving Early Career Scientists." Undergraduate Biology Education Research Gordon Research Seminar, June 2019.

FELLOWSHIPS AND GRANTS

UC Online Grant for DEI & A in Teaching and Learning: Online Modules for UC Campuses Project shared with UC Santa Barbara and UC Irvine [$345,000]	2022 – 2025
Ethics, Society, and Technology Hub Seed Grant Seed, McCoy Family Center for Ethics in Society, Stanford University [$8,000]	2021
Teaching Advancement Grant, Center for Teaching and Learning (CTL), Stanford University [$2,500]	2021
F99/K00 Predoctoral to Postdoctoral Fellow Transition Award, National Cancer Institute, National Institutes of Health (NIH) [$72,400 F99 phase, estimated $220,000 K00 phase]	2016 – 2018
Diversifying Academia, Recruiting Excellence (DARE) Fellowship, Vice Provost for Graduate Education, Stanford [$104,000]	2016 – 2018
National Science Foundation (NSF) Graduate Research Fellowship [$136,000]	2013 – 2016

HONORS AND AWARDS

UC Berkeley SPOT Award	2024
BIOE Justice, Equity, Diversity, and Inclusion (JEDI) Award	2021
RStudio Diversity Scholar, rstudio::global 2021 Virtual Conference	2021
Student Travel Award, International Society for Advancement of Cytometry (ISAC)	2017
Second Place Award for Best Talk, Stanford Cancer Biology Annual Conference	2016
Best Predoctoral Poster Award, SACB Meeting	2016

PROFESSIONAL DEVELOPMENT

WSCUC Accreditation Leadership Academy (ALA) Program	2024 – 2025
Staff as Students in Social Justice (SSSJ) Program	2023
SABER West Becoming an Antiracist Educator Workshop	2021
Stanford University "ISMS" Communicator Workshop Series	2020
CIRTL Network: Advancing Learning Through Evidence-Based STEM Teaching on edX	2020

SEPAL Scientific Teaching Summer Institute	2017
CIRTL Network: An Introduction to Evidence-Based Undergraduate STEM Teaching through edX - Completion with Distinction	2017

RELEVANT TECHNICAL SKILLS

Expert in Google-suite and Microsoft Office productivity and collaboration software

Expert in Canvas course design with Canvas certification through Foothill College

Expert in Poll Everywhere and iClicker software for interactive course design

Expert in R programming for data analysis/visualization using tidyverse and ggplot2 library

Expert in survey design and distribution using Google Forms and Qualtrics

Proficient in Zoom and Panopto for synchronous and asynchronous course video content

Proficient in Trello software for project management and task delegation

Proficient in teaching programming using Jupyter Notebooks and cloud options like CoCalc

Proficient in git and GitHub for version control and project collaboration

Proficient in HTML, Markdown, Wordpress, and Drupal for web content publications

Proficient in Gradescope online assignment and exam grading tool

Proficient in communication tools and social media including Slack, Discord, and Instagram