

Dr. Zoë E. Buck Bracey

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EDUCATION

PhD, Education

UC Santa Cruz June 2014

MA, Education

UC Santa Cruz June 2011

BA (cum laude), Astrophysics

Princeton University June 2008

EMPLOYMENT

BSCS Science Learning

Senior Science Educator/ Director of Learning for a Just and Sustainable Future

Colorado Springs

2022-present

BSCS Science Learning

Science Educator

Colorado Springs

2014-2022

Hartnell College

Astronomy Instructor

Salinas

2012-2015

AstroCamp

Science Instructor

Idyllwild

2008-2009

SETI/Lick Observatory

Research Associate II

Mt. Hamilton

2006-2007

ABOUT

Dr. Buck Bracey is a Senior Science Educator and Director of Learning for a Just and Sustainable Future at BSCS Science Learning. She works across curriculum development, professional learning, and research, with a focus on meaningful, multi-dimensional science learning experiences that empower educators and students to use what they figure out to sustain and protect the people, communities, lands and waters that they care about.

EXPERIENCE

Principal Investigator

Dr. Buck Bracey is a co-PI on the *Engaging Science Learning Through OpenSciEd* grant, which seeks to understand the efficacy of OpenSciEd Middle School in collaboration with AIR and Southern University in Baton Rouge. Previously, she was co-PI on the NSF IUSE grant *Engaging Stem Transformative Experiences for Early Momentum (ESTEEM)*, collaborating with a central California Community College to facilitate professional learning with faculty and staff, and collect data to describe the impact of the intervention.

Curriculum Developer

Dr. Buck Bracey has fifteen years of instructional design experience as a director, a developer, and an educator. She is a leading expert in developing equitable, phenomenon-based, NGSS-aligned instructional materials with and for K-15 educators. She has led the development of more than half a dozen units that hold NGSS design badges awarded to top-rated science lessons and units designed for the Next Generation Science Standards (NGSS), and written on dozens more. Most recently, she was the Physics Course lead and an associate Director for the OpenSciEd High School Developer's Consortium, for which she facilitated co-design that drew on the ideas, experiences and expertise of hundreds of field test teachers, administrators, content experts, and education researchers.

Professional Learning Designer/Facilitator

Dr. Buck Bracey has designed and facilitated professional learning in dozens of states, working with districts and other interest-holders to meet the needs of educators and students. This includes extensive work with the OpenSciEd Middle School and High School professional learning materials, and the BSCS Science Teachers Learning through Lesson Analysis (STeLLA) project. Dr. Buck Bracey has also worked extensively supporting educational leaders, including OpenSciEd facilitators, and community college faculty mentors.

SELECT PUBLICATIONS

- Buck Bracey, Z. E.**, Noll, J.D., Rojas, D., Fleegal, K., Kremer, J., Whitaker, R. (in prep for the Journal of Curriculum Studies). How does the framing of anchoring phenomena affect student perception of interest and relevance?
- Weindling, M., **Buck Bracey Z. E.**, Salazar, B., Palmer, B., Yahdi, M. (In review at the Community College Journal of Research and Practice). Exploring the impact of micro-internships on students' affective outcomes to close the internship access gap.
- Buck Bracey, Z. E.**, Kremer, J., Rojas-Perilla, D., Mills, W., Novak, M. (2024). The OpenSciEd Texas Power Crisis Unit: A Coherent, Phenomenon-driven Approach to Learning Complex Ideas in Physics. Accepted for publication in *The Physics Teacher*.
- Buck Bracey Z. E.**, Gardner, A., Weindling, M., Yahdi, M. (2024). Creating Collaborative Spaces for Community College Faculty and Staff to Discuss Pedagogy. *Community College Journal of Research and Practice*, 1-18.
- Penuel, W., Henson, K., **Buck Bracey Z. E.**, Vick, N., Reiser, B., Rivet, A. (2024). Designing Standards-Aligned Instructional Materials That Connect to Students' Interests and Community Priorities. *The Science Teacher*, 91(5), 62-70.
- Buck Bracey, Z. E.**, Stuhlsatz, M., Wilson, C., Cheuk, T., Santiago, M.M., Osborne, J., Haudek, K., Donovan, B. (2023). Investigating Differential Severity Across Linguistic Subgroups in Automated Scoring of Student Argumentation, In *Advances in Applications of Rasch Measurement in Science Education*, Xiufeng Liu and William Boone., editors.
- Wilson C, Haudek K, Osborne J, **Buck Bracey Z. E.**, Cheuk T, Donovan B, Stuhlsatz M, Santiago M, Zhai X. (2023). Using automated analysis to assess middle school students' competence with scientific argumentation. *Journal of Research in Science Teaching*, 61(1), 38-69.
- Stuhlsatz, M. A., **Buck Bracey, Z. E.**, & Donovan, B. M. (2020). Investigating Conflation of Sex and Gender Language in Student Writing About Genetics. *Science & Education*, 1-28.
- Edelson, D.C. Reiser, B.J., McNeill, K.L., Mohan, A., Novak, M., Mohan, L., Affolter, R., McGill, T., **Buck Bracey, Z. E.**, Noll, J.D., ...Suarez, E. (2020). Developing Research-Based Instructional Materials to Support Large-Scale Transformation of Science Teaching and Learning: The Approach of the OpenSciEd Middle School Program.
- Donovan, B. M., Semmens, R., Keck, P., Brimhall, E., Busch, K. C., Weindling, M., Duncan, A., Stuhlsatz, M, **Buck Bracey, Z. E....** & Kowalski, S. (2019). Toward a more humane genetics education: Learning about the social and quantitative complexities of human genetic variation research could reduce racial bias in adolescent and adult populations. *Science Education*, 103(3), 529-560.
- Donovan, B.M., Stuhlsatz, M., Edelson, D.C., **Buck Bracey, Z. E.** (2019). Gendered Genetics: How reading about the genetic basis of sex differences in biology textbooks could affect beliefs associated with science gender disparities. *Science Education*.
- Buck Bracey, Z. E.** (2017). Personal Universes: revealing community college students' competences through their organization of the cosmos. *Cultural Studies of Science Education*. <https://doi.org/10.1007/s11422-017-9827-z>
- Buck Bracey, Z. E.** (2017). Students from non-dominant linguistic backgrounds making sense of cosmology visualizations. *Journal of Research in Science Teaching*, 54(1), 29-57.
- Buck, Z. E.**, Lee, H. S., & Flores, J. (2014). I Am Sure There May Be a Planet There: Student articulation of uncertainty in argumentation tasks. *International Journal of Science Education*, 36(14), 2391-2420.
- Lee, H.-S., Liu, O. L., Pallant, A., Roohr, K. C., Pryputniewicz, S. and **Buck, Z. E.** (2014), Assessment of uncertainty-infused scientific argumentation. *J. Res. Sci. Teach.*, 51: 581–605.
- Jiang, L., Fan, X., Bian, F., McGreer, I. D., Strauss, M. A., Annis, J., **Buck, Z.E.,...** & Richards, G. (2014). The Sloan Digital Sky Survey Stripe 82 Imaging Data: Depth-Optimized Co-adds Over 300 Deg² in Five Filters. arXiv preprint arXiv:1405.7382.
- Buck, Z. E.** (2013). The Effect of Color Choice on Learner Interpretation of a Cosmology Visualization. *Astronomy Education Review*, 12 (1), 010104.

SERVICE

Dr. Buck Bracey co-founded the Equity and Social Justice working group at BSCS Science Learning in 2018, and co-chaired the group for five years. She is still an active member. She also serves on the board of directors for the Pikes Peak Observatory.

AWARDS AND HONORS

- *Education Department Blue & Gold Fellowship, 9/13*
- *UC All Campus Consortium on Research for Diversity Dissertation Fellowship, 9/12*
- *Chancellor's Fellowship, University of California, 9/09*
- *Sigma Xi: The Scientific Research Society, 6/08*
- *Association for the Advancement of Science (AAAS) Mass Media Fellowship, 5/08*
- *National Merit Scholar Finalist, 6/04*

LANGUAGES

English

Native language

Spanish

Advanced/intermediate second language (conversational, conducting interviews, discussing course content with students during/after class, grading student work in Spanish, translating written and verbal course content)

Catalan

Reading, basic writing, simple conversation (A1 certificate)